№55 3/2020

life in ESTONIA



NATO Centre of Excellence in Tallinn – a 360° look at cyber defence

Estonia's national strength: CyberTech

Brazilian female IT-specialists making waves in Estonia

Estonia hosts the restart of the WRC series

Viinistu fishing village turned art hub

The Veljo Tormis Virtual Centre opened

President Kaljulaid: Estonia is sharing cyber expertise

enter
e-estonia

we have built a digital society and we can show you how



Photo by Liina Notta

Cover photo by
Atko Januson

Estonia shows the world how to build resilient information infrastructure

Estonians have long thought of their digital society as essential infrastructure — and invested in its resilience accordingly. While others asked IF digital tools were safe, Estonians were busy at work on the question of HOW to make them as safe as possible.

Estonia's ID-card and X-Road were built as secure systems over 20 years ago. After the 2007 cyberattacks against Estonia, safeguarding the nation's critical information infrastructure became a key priority, supported by new legislation, public-private partnerships (such as the Cyber Defence Unit of Estonia's volunteer national guard), blockchain-based data integrity and regular cyber exercises. As a result, Estonians use and rely on their information infrastructures as no other country does; this includes "killer apps" like online voting.

The COVID crisis, with its massive shift to remote work and telemedicine, is a coming-of-age test for all digital societies.

Estonia's digital society aced the test. Courts and government procedures ground to a halt in many countries, but the digital government in Estonia continued as usual, with e-health and e-school systems providing an infrastructure for telemedicine and remote schooling. A new e-service to support the government's wage replacement scheme for furloughed workers went from the drawing board to deployment in a week. And in less than 24 hours, the Estonian startup ecosystem organised a COVID-hackathon, launching a 'Hack the Crisis' movement with over 100 000 participants in 40 countries.

But far more difficult tests of global digital readiness are coming. In the next decade, the world needs new information infrastructures to solve big challenges: distributing and verifying billions of COVID vaccines and secure data sharing to prevent the next global pandemic. Measurable carbon footprints and distributed power grids to support the green revolution. Seamless verification of individual and company identities to maintain trust in global commerce. Secure and interoperable 5G, 6G, cloud and edge computing for all of these to run on.

Estonian tech and cybersecurity companies are dreaming up and building out these global infrastructures, while Estonian leadership in international organisations from the EU to the World Health Organisation builds a supportive policy framework. Together, we will make the whole world digitally resilient.

Luukas Ilves
Member of the Advisory Group,
EU Agency for Cybersecurity (ENISA)
Head of Strategy, Guardtime



Photo by Atko Januson

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Estonian Investment Agency supports companies investing and expanding in Estonia. World-class human capital, unique digital capabilities and a competitive business environment make Estonia a smart, agile location for businesses with global ambitions.

investinestonia.com

The production of the magazine has been inspired by green technology

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Estonia in UNSC — focus on cyber, relentless on international law

Estonia is an elected non-permanent member of the UN Security Council for 2020 and 2021. President Kersti Kaljulaid, who spearheaded the campaign for the membership, considers Estonia ready to answer the question "What can we do for the world?". She talked to *Life in Estonia* about the tools a small country can use to navigate a complicated era of international relations.

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A conversation starter in cyber defence

The NATO CCDCOE is a multinational and interdisciplinary cyber defence hub that was established in Tallinn in 2008. It brings together researchers, analysts and educators from the military, government, academia and industry to provide a 360-degree look at cyber defence. *Life in Estonia* asked the Director of the CCDCOE, Col. Jaak Tarien, about the biggest achievements and challenges.

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Building trust on the Internet

Have you ever wondered how identity verification on online platforms works? Well, Kaarel Kotkas, the founder and CEO of Estonian identity verification startup Veriff, definitely has. With the help of artificial intelligence, Veriff analyses thousands of technological and behavioural variables in seconds, verifying people from 190+ countries.

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Entify cuts KYC report times from eternity to minutes

One of the main missions of any business is to expand its client portfolio. The task could be very difficult, due to AML regulations and financial fraud prevention. Entify produces a Know Your Customer (KYC) report in just one click.

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Visory turns your camera feed into data you can actually use

Visory is an Estonian startup that helps computers understand what lies in a picture or a video: from cars and garbage to traffic flow, from how social distancing rules are being followed to possible crimes on security videos. It is like Google for pictures and videos, understanding everything that is on and in them.

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Icefire helps companies create safe and seamless digital experiences

In the face of the current global challenges, digital identity is more fundamental than ever when offering secure online customer experiences, organising remote work for employees or allowing citizens to access secure government services. Martin Valler has made these his calling at Icefire.

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Guardtime turned trust into digital truth

Guardtime has developed a system based on blockchain technology that can verify the correctness of data, networks, systems and processes with a mathematical proof called KSI Blockchain. This technology can be used both in space and on earth.

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The American Dream of Nortal, the company that built a third of e-Estonia

Nortal offers data-based simplification of business processes for both public and private sector clients. Nearly a third of the Estonian

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e-government solutions have been developed by them. In 2017, Nortal touched down in the USA. Today, they can boast several Fortune500 companies among their clients.

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Cybernetica creates IT-solutions that (just) cannot fail

The software company Cybernetica was already involved in developing an e-society in the late 1990s. Many systems currently operating in Estonia were created with their involvement. The company's main goal is to create mission-critical software solutions for clients. They have created a new, tokenless authentication system called SplitKey that is unique in the world.

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Malwarebytes crushes cyber-threats and restores confidence

Fernando Francisco, Vice President of the American cybersecurity firm Malwarebytes, reveals why the company decided to open an office in Tallinn, whether it was a good decision, what effect the pandemic has had on cyber-threats, and what the most common cyber-threats are at the moment.

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How to secure cryptography against quantum computers?

Estonia has built an ecosystem wherein 99% of its governmental services are online. How to ensure their security at a time when the development of quantum computers is in full swing? The solution is to improve quantum cryptography. Dominique Unruh, Professor of cryptography at the University of Tartu, is working on this task.

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**PORTFOLIO.
Collection of Jaan Manitski.
Viinistu Art Museum**

Viinistu Art Museum has opened a new, permanent exhibition with around 400 works by Estonian artists from the private collection of Jaan Manitski, who can be frequently spotted giving tours in the museum. Alongside the art museum is a hotel, restaurant, chapel, theatre hall and marina. But Manitski has even bigger plans.

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Veljo Tormis 90: the sound archaeologist's legacy turns virtual

Veljo Tormis is the composer who brought the archaic, runic song of the Finno-Ugric people into the limelight and saved the ancient art from oblivion. This August, the Veljo Tormis virtual centre, where choirs all over the world can find his music easily, was opened for his 90th birthday.

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The Estonian IT-sector is attracting an increasing number of experienced Brazilian female specialists

Estonian companies are open to recruiting Brazilian talent who quickly go on to become valued employees and promoters of the Estonian experience. The Work in Estonia initiative is the connector that helps the talent and Estonian companies find each other more easily.

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**Estonia pulls off miracles in hosting the restart of the WRC series.
Ott Tänak makes history**

Estonia has made the impossible happen. In two and a half months, the FIA World Rally Championship round was organised in Southern Estonia. And the result was a true fairy-tale: Ott Tänak and his co-pilot Martin Järveoja became champions of the historical rally in their native Estonia.

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**Up close and personal ...
with a brown bear**

NaTourEst has been offering adventure and nature holidays in Estonia since 2008 and now owns 85 ha of wilderness, approximately 150 km east of Tallinn, where about half of Estonia's 800 brown bears live. Bear attacks are extremely rare in Estonia and there is no record of a person being killed by a bear. So, welcome to a bloodless bear hunt!

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Events calendar: Highlights from October to December















Photos by Ahto Sooaru



The first ever hybrid Latitude59

By Maarja Pehk



Latitude59 has always been a very international event, attracting investors, startups and speakers from all over the world. In the months following the initial decision to postpone, we realised that our plans to invite the usual 2500 people just weren't viable. Although we did consider going fully online — as many other events have — after having organised and attended many online events ourselves, we saw that the real potential lies in bringing the online and physical together, safely. We had three months to build something that had never been done before.

Like many other events, Estonia's flagship tech and startup gathering Latitude59 was also forced to rethink its format. The event took place on the 27th and 28th of August, 3 months later than usual. With a lot of hard work and — dare we say — some luck, it was put on as a hybrid event, meaning that attendees were present both online and onsite in Tallinn. Latitude59 attracted almost 2000 participants from 55 countries. To the best of our knowledge, it was the first hybrid tech event on such a scale to take place in the region, perhaps even in the whole of Europe.

Going hybrid

Initially, the concept of a hybrid event was quite foreign and we had to constantly educate our audience and partners: no, we didn't suddenly start building hybrid cars, and yes, the event is actually taking place physically as well as online. However, while preparing the hybrid event, we were in constant readiness to pivot to online only, should the circumstances worsen. We were lucky that the COVID-19 situation in Estonia and its neighbouring countries remained under control for most of the summer.





From the get-go we decided that this year's focus was going to be even more on startups and investors. However, securing speakers in such circumstances was no easy task. We didn't entertain any illusions that we could host our usual 100+ speakers from all over the world in Tallinn and began working on an agenda/concept that included our most popular programme elements. Founder stories, the Best of the Baltic states showcase, and the Investor Reverse Pitch all made the cut, as well as some sessions that focused on the challenges that both startups and investors are facing right now.

We were also fairly adamant that, while speakers could be present via video calls, there must always be someone on the stage in Kultuurikatel as well, creating a truly hybrid experience. That way, we were able to host pitches from the Belarussian startup community, hear from different Swedish funds about investing in innovation and even have two sessions with Japan. We did have some online-only events as well, such as the Mastercard Lighthouse programme demo day with 18 FinTech and impact startup pitches.

Startups

One of the most popular parts of Latitude59 has always been our startup demo area with a lot of hustle and bustle and human contact. In these current circumstances, it was pretty clear that hosting the startup demo area in its usual format would be a health risk and thus decided to move the area fully online to our digital event app Talque. Together with our partners from Tehnopol Startup Incubator, we hosted a virtual demo area where Tehnopol streamed interviews and discussions with some of the most promising startups, experts, investors, and community members.

Another first for Latitude59 was the mentor programme, aimed specifically at startups. The programme brought together 67 worldwide experts advising on a host of topics, including: explaining your tech to investors with Mick Halsband from Lunar Ventures, KPI-s for pre-revenue sales with James Isilay from Cognism and customer service for the early stage with Cristina Fonseca from Talkdesk and Indico Capital. In the end, some 160 startups from all over the world took part. While there were definitely some glitches on the way, we've been receiving overwhelmingly positive feedback about the programme. This is something that we're definitely taking with us to the upcoming editions, albeit with a little more refined process.

Investors and matchmaking

Over the years, we've worked hard to make Latitude59 a must-attend event in the calendars of international investors and have seen a year-on-year increase in the interest towards the region. With more than 70 VC funds in attendance (both online and on-site) and a total of 325 investors from 32 countries, we can safely say that the hard work is beginning to pay off. The Investor Breakfast co-hosted by Invest Estonia was streamed to all of the investors attending online too — we're just gutted that we couldn't offer actual food to the online participants.

However, one of our key challenges in putting on a hybrid event was to ensure that those who attended online could interact with the physical attendees. To allow this, we decided to open our digital event app for video calls for the whole week and were extremely glad to see many calls happening onsite as well.

Pitches

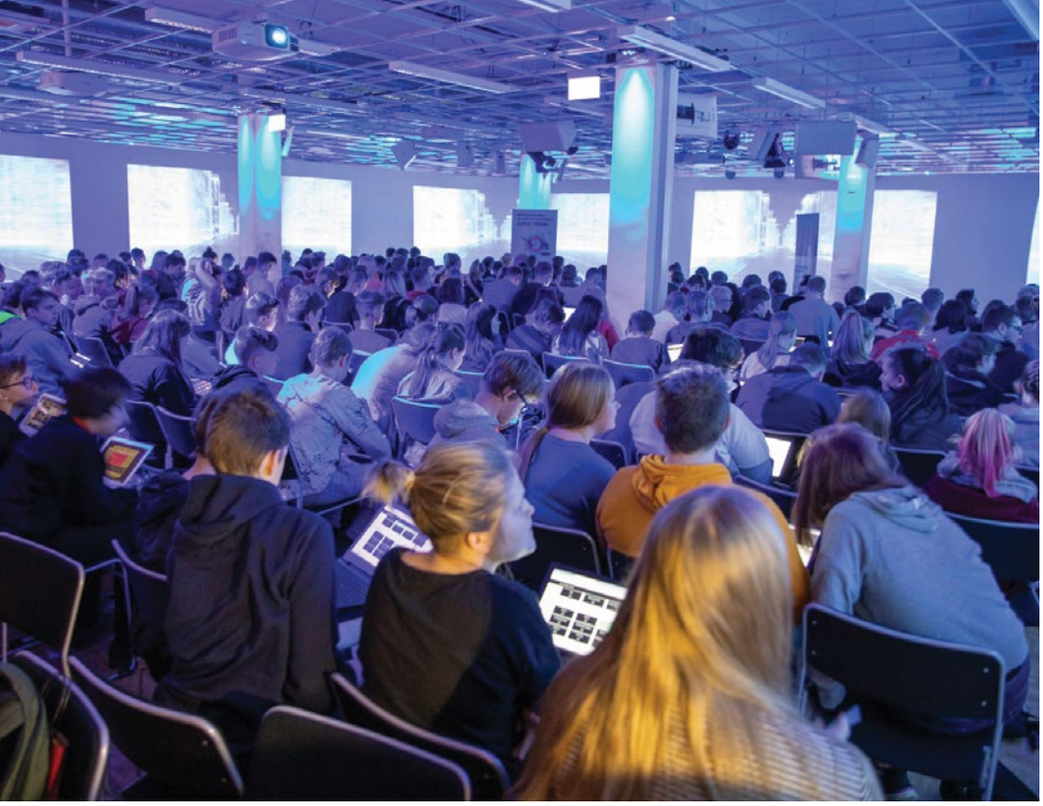
One of the highlights of Latitude59 has always been the pitching competition. This year, we decided to put a little spin on our usual practices and hosted the first ever Latitude59 Pitching Competition online pre-finals in the beginning of August. Five days, 50 teams, 11 jury members. From there, 10 teams went on to the Startup Wise Guys bootcamp to pitch in front of the Estonian Business Angels Network EstBAN investor committee. Five teams made it to the Latitude59 main stage with Adact and ATOM Mobility both winning the 200 000 EUR syndicate investment from EstBAN, and ATOM also bagging the 10 000 EUR cash prize from Latitude59.

In addition to the main pitching competition, numerous other competitions and showcases took place with almost 90 pitches being delivered over the two days.

Physical event — what precautions did we take

One of the aspects that was constantly on our minds was guaranteeing the safety of all the on-site attendees. As mentioned, Estonia was one of the few countries with relatively low infection rates throughout the summer. Nevertheless, putting on an event with almost 1000 physical attendees, some of them travelling from abroad during a global pandemic, comes with a host of risks. In addition to having less people at the venue than usual, we also provided an ample amount of disinfectant, constantly aired the main conference halls and, together with our partners from Invest Estonia, made sure that participants had access to masks. Participants were asked to fill in a self-assessment questionnaire — more for the psychological effect than anything else — and had a doctor on call and a medic available on premises. In these circumstances there is no such thing as over-communicating. We were really glad to hear about responsible participants who, despite having an on-site ticket, decided to participate online when feeling a little under the weather.

In conclusion, this event wouldn't have been possible without the support of the vibrant Estonian startup community and all the partners and sponsors of Latitude59. Many of the elements tested at the first ever hybrid Latitude59 will definitely make their way to future editions as well. The next Latitude59 is set to take place on the 27th and 28th of May 2021, with super-early bird tickets now on sale at **www.latitude59.ee.**



Photos by Mati Leet

Dates 2020–2021 school year:

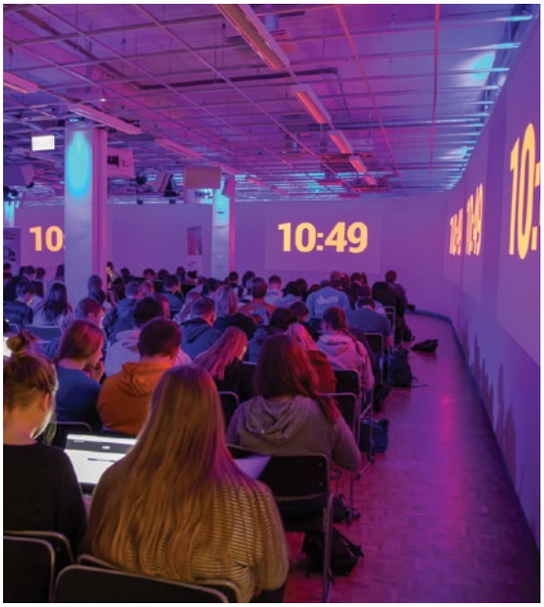
1.10 - 8.11.2020 — CyberCracker
1.10 - 8.11 and 8.12.2020 — CyberCracker CyberDrill
1. - 28.02.2021 — CyberPin
7.03 - 12.06.2021 — CyberSpike



Educating the young to be cybersecurity warriors

By Birgy Lorenz, Cyber Olympic project manager





Cybersecurity education in Estonia starts from the 1st grade and empowers schools to discover young talents as early as possible. The CyberOlympic program at TalTech implements challenges and competitions to think critically, outside the box, and use hacker-skills to improve defence. The program is funded by the Ministry of Defence, TalTech and the industry.

CyberPin challenge (grades 1-6) includes puzzles and crypto exercises like matching plugs and ports; encrypting secret messages "ainotsEotemocleW" (answer: read the word backward). The online challenge takes place every February, which is known as 'Safer Internet Month' in Estonia.

In October, when the European Cyber Security month takes place, we host:

A. **CyberCracker** (grades 4-9) where technology acceptance is measured. Answers show how students protect their computers with antivirus software and passwords, what they would do in the case of ransomware, or what their take is on legislation regarding technology innovation such as drones delivering goods to homes or artificial intelligence robots taking the roles of teachers.

B. **CyberCracker CyberDrill** (grades 7-12) which helps schools discover new talents who have self-learned IT and hacker-skills. Questions in this round let students analyse and clean logs to detect criminals in the systems or extract location from pictures. For prizes, we share the possibility of getting additional training, visiting companies, or having a guest lecture at school to empower youngsters to discover career possibilities in IT and cybersecurity.

In spring, **CyberSpike** for higher-level, young (14-to 25-year-old) hackers takes place. Participants access simulated networks and computer systems to discover vulnerabilities. Our winners represent Estonia in various world-level competitions like the **European Cyber Security Challenge** (EU), **CyberPatriot** (USA), **Cyber Security Discovery Camp** (Asia/Singapore), receive an internship, additional training, or even get the possibility to participate in NATOs biggest training: **Locked Shields**. The event is organised with the help of RangeForce or Cyber Security Exercises or Training Centre CR14.

Facts of participation: CyberPin (around 9000 students, 243 schools); CyberCracker testing (around 8000 students from 250 schools); CyberCracker Cyber Drill (around 2600 students, 65 schools); CyberSpike (300 registered young hackers).

kyberolympia







Woola wins the EIT InnoEnergy 2020 PowerUp! Grand Final

The Estonian startup Woola, which produces environmentally friendly packaging material, has won Europe's largest Greentech competition: the EIT InnoEnergy 2020 PowerUp! Grand Final, which took place as an online event on the 25th of June. The PowerUp! competition, organised for the sixth time by the EIT InnoEnergy, Europe's largest sustainable energy impact fund, is the largest and most important competition for startups in the CEE region. More than 360 startups applied for the program, out of which 14 startups from various Central and Eastern European countries made it to the final round.

As winner of the competition, Woola, in addition to the 50 000-euro prize, will have access to EIT InnoEnergy's extensive network and financial investments.

Woola was established at the end of 2019 and produces packaging material from sheep wool residues that would otherwise be thrown away. The Estonian startup's aim is to disrupt the e-commerce market by significantly decreasing the production, consumption and landfill waste of environmentally harmful materials like Styrofoam and plastic. The product is shockproof, heat-proof, and compostable at home within six months.

Anna-Liisa Palatu, one of the founders of Woola, expressed her excitement over the collaboration with EIT InnoEnergy: "Winning the title of Startup of the Year in the CEE region can be a real game-changer for us and help us reach our next goals."

www.woola.io



RangeForce raises $16 million to help enterprises build cyber resilience

RangeForce, the Estonian cloud-based cybersecurity training platform, has closed a $16 million Series A round led by Energy Impact Partners. Paladin Capital Group continues its longstanding support of RangeForce as part of this round. The Series A also includes the existing firm Trind as well as a new investment from Cisco Investments.

RangeForce's headquarters are in Virginia. The company's roots are in building the cyber range for NATO's Cooperative Cyber Defence Centre of Excellence, solving an important problem for global enterprises — how to put a remotely accessible training program in place that can assess, train, and continually upskill cyber professionals. The company provides hands-on, measurable simulation training for cybersecurity and IT operations professionals. The RangeForce cloud platform allows teams to acquire skills by defending against real attacks in an engaging and a competitive environment, a scalable and cost-effective alternative to traditional cyber ranges.

More than 100 organisations have already benefited from the RangeForce platform, including governments and financial services, as well as some of the world's largest technology, retail, telecom, and healthcare organisations.

According to the CEO of RangeForce, Taavi Must, this round of funding validates the company's mission to bring highly effective operational cybersecurity training to organisations of all sizes. RangeForce will use the funding to accelerate its efforts to go to market, advance product development, expand its ecosystem of training orchestration partners, and focus on global growth.

www.rangeforce.com

CyberTech startups boost revenue by more than 50%

The Startup Estonia database shows that Estonian CyberTech startups had a booming first six months of the year; compared to the first half of 2019, the revenue of these startups has increased by 54%, totalling 17 million euros.

Among Estonian CyberTech startups, Veriff signed the largest funding agreement — 14 million euros. RangeForce attracted funding in the amount of 13.5 million euros. In the first half of the year, the top three revenue makers were Messente Communications (€4.8 million), Veriff (€2.2 million), and HasCoins/Burfa (€4.1 million).

Currently, there are 50 CyberTech startups in Estonia employing approximately 500 people. During the first six months of 2020, CyberTech companies paid 3.6 million euros in employment taxes (an 80% increase year-on-year). With 226 employees, Veriff was the largest employer in the second quarter of 2020 and made the biggest contribution to employment taxes, totalling 1.8 million euros.

The Startup Estonia database shows that 12% of the startups registered this year reported CyberTech as their field of activity. Marily Hendrikson, Head of CyberTech at Startup Estonia, explained that Estonia has very strong competence in cyber technology. "The goal of Startup Estonia is to strengthen the ecosystem of companies engaged in CyberTech activities by bringing together various communities and competencies. This enables us to create good conditions for starting new companies and growth, which, in turn, makes for fertile ground for the next success stories and helps us, as a nation and society, to be better prepared for the digital future," she said.

Photo by Atko Januson

Estonia in UNSC – focus on cyber, relentless on international law

Interview with President Kersti Kaljulaid

by Maris Hellrand



Estonia is an elected non-permanent member of the UN Security Council for 2020 and 2021.

President Kersti Kaljulaid, who spearheaded the campaign for the membership, considers Estonia ready to answer the question "What can we do for the world?". She talked to *Life in Estonia* about the tools a small country can use to navigate a complicated era of international relations.



Photos by CCDCOE

Reputation means security

Estonia worked hard for its membership in the United Nations Security Council (UNSC) and you yourself made a significant contribution of your time and effort. Eight months into the membership — can we say it has been worthwhile?

The UNSC membership campaign in itself was of great benefit for Estonia. For a small country to become known among the international community is already a great gain in security. Reputation means security. Let me give you an example — we know that many species in the world go extinct every day but it never crosses the news threshold because no one has ever heard of those species. If something happens to a cute and well-known animal, the whole world speaks about it. In order to be well-protected, you also need to be well known. This also applies to countries. With the UNSC campaign, we significantly expanded the circle of our friends, increased Estonia's visibility, and explained to people how we have managed to achieve such economic success in 30 years. It resonated with so many countries because it created an opportunity to identify. 30 years ago, Estonia was below the official IMF poverty line as a country, now we are a rich country. Our story is an inspiration to many others and, while telling it during the campaign, we created many new business opportunities for Estonian companies. At the same time, the campaign also established friendships that will be there for us when needed, even in the event of a natural disaster.

I was the leader of this campaign; I was responsible for giving Estonia this opportunity. Today, our work and activities in the UNSC, as we promised, are being carried out by our mission in New York based on a framework approved by the government, stemming from the principles of international law, our own previous positions, the position of the European Union.



Colonel Tarien giving Kersti Kaljulaid, President of Estonia, and Raimonds Vējonis, former President of Latvia, a tour of the CCDCOE

Digital diplomacy — Estonia set a new benchmark

The pandemic has imposed new forms of diplomacy. During the first round of the UNSC presidency in May, Estonia organised virtual sessions at a very high technical level and may have already set a new benchmark on the working process. But can diplomacy be done without meeting face to face?

The rapid digitisation, also in diplomacy, is indeed associated with our country. I think it's fair to admit that through digital channels it's very easy to maintain the existing relationships. If you already know the people, it's not difficult, but in the long run it can be complicated. Because of this UNSC campaign, I happened to get a very large circle of friends among foreign heads of states and diplomats, which is very useful when you can't have usual face-to-face meetings. When it comes to building new relationships, even my own generation is not used to doing it virtually. But I think in the 10-year span, the younger generation doesn't understand at all what the difference is between virtual and real interaction. In fact, even now, the coordination of the UNSC work takes place on WhatsApp. Be it the UN South-South gathering somewhere in Argentina or the CARICOM meeting or the African Union, advisers from all countries are coordinating the meetings via WhatsApp group. This is a large international online community. By the time the heads of states shake hands, the WhatsApp group has done the job in the background. So, in that sense, it's not as sharp a transition as it seems.



The current era is characterised by a fierce confrontation between the permanent members of the UNSC that is even paralysing its response to the COVID-19 pandemic. What can a small country as a non-permanent member of the UNSC do in that situation?

As we promised in our campaign — we act based on international law and previous agreements, not interests. You cannot support someone's position because they are your partner or ally. As soon as you climb off the platform of international law once, you have lost that opportunity forever, because it is no longer possible to refuse to choose sides. That is why small countries are favoured as UNSC members, because it is known that 'international law is their nuclear weapon' (as put by the former president of Estonia Lennart Meri). There is no point or reason for us to abandon this continuity. It was known in advance to everyone who voted for us.



'It's time for Estonia to do our share for the international community by safeguarding international law and sharing cyber expertise'

The big topics of the signature events during the Estonian UNSC presidency were World War II and cyber security. It is not noticeable though that the positions of the great powers on these issues have shifted closer to each other. Is that even possible?

The aim of the sessions was to talk about security in this century, not to formulate a common position about history. We understand that there are many new challenges here that we are not used to dealing with, plus all the old ones are still here as well. For me, the precedent-setting of attributing an actual cyber-attack was even more valuable than the great debates. It has been undeservedly overlooked when Estonia raised the issue of cyber-attacks against Georgia in the UNSC together with the UK and the USA in August. This was the first time that a cyber-attack had been raised in the UNSC and attributed to someone. Russia was responsible for the attack. Unbelievable, but in 2020 it was a precedent. It was the promise of our campaign that we would seize the opportunity to get the UNSC to deal with cyber issues, so that was expected of us. We promised to raise digital issues in the UNSC and we have already helped to raise awareness that today's war is largely digital. I hope that the understanding that we do not need to create an additional legal space, but that everything that applies in analogue also applies in the digital world will take root quietly through practice.

Same rules for the analogue world and cyber space

Cyber security has been at the heart of Estonia and here we have both experience and expertise. What role should the United Nations play in this area? What are the prospects that we will get some results in the near future, while technology clearly develops at a faster pace than policy and legislation?

As the legal process is much slower than the technological, it does not make sense to try to reach an agreement for each generation of technology. Agreements must be valid for all sectors and simply include the statement that what applies in the analogue world also applies in cyberspace. The more widespread this opinion is, the closer we will be to clarity. One of the things that Estonia has called on everyone to do is for each country to describe how it thinks international law and its own law apply in cyberspace. Estonia has adopted this declaration in government, we also invite other countries to describe their understanding.

We know that there are countries and people who see cyber-attacks every day, not just in warring countries. The question is, if you are attacked, how can you legally respond? What to do if you identify where the attack is coming from and the other state says it is not going to do anything about it? Do you have the right to go and retaliate? Is this right digital or also physical? Legal clarity is needed.

Big countries are dealing with the attribution of the attacks — the US and France have attributed attacks to Russia. After all, one of the first tough international political objections came surprisingly from France when Emmanuel Macron told Vladimir Putin on the stairs of the **Élysée** palace that Russia interfered in France's democratic process. This is a high level of attribution. That is the only effective option today — at a very high level and highly visible. Smaller countries do not have this capability. A large number of countries do not deal with attribution. Even if they see attacks happening, there is no place to go with a complaint. Hopefully, the UN Security Council will become this place.



Photos by Eleri Ever





At the UN, after Estonia was elected a non-permanent member of the UN Security Council for 2020 and 2021

It's time to contribute

UNSC membership has forced Estonia to deal with problems in countries that seem distant and insignificant to us. Why are these issues important for us as well and what can Estonia do?

We have been involved in international missions with our defence forces for 27 years since the conflict in former Yugoslavia, where we took part in peacekeeping missions — this means taking responsibility for global security. We are doing exactly the same now in the UN Security Council. Estonia is a developed country, a prosperous country. It's time to contribute. It is time to take that responsibility when we see that we have the skills to do it: we are quick responders, good negotiators, a small cyber savvy country that everyone trusts, because we have every reason to respect international law. Of course, we could always say that it's none of our business, let's close the windows and doors and not listen to the fact that there is drought or thunder outside, or the climate is warming. But it would not be fair to ignore our responsibility, as we have benefitted from the international community a great deal in the last 30 years. Actually, even in the 50 years before that, because the policy of non-recognition of the Soviet occupation was something someone had to pursue. This way we were able to restore our independence based on international law. The international community has given us so much. Now that we have the capacity and the strength, we need to do our share.

We are used to contributing through our military missions, but diplomatic missions are just as important, especially since, ideally, this way we will be able to avoid the military missions.

'Estonia has expanded our circle of friends and inspired many small countries with our success story'

How to measure the success of the UNSC membership? Is it enough that all member states of the UN now know that Estonia exists at all?

First of all, we must keep our election promises and keep a focus on cyber issues. This 'European Spring' — the French, German and Estonian presidencies of the UNSC for three months in a row — certainly intensified our contacts with French and German diplomats, which may be very important at a critical time. This is certainly a value that is difficult to measure, but which must be considered a positive result. We still have a long way to go, as the second round of UNSC presidency is still ahead. We can already be proud of what we have done, but we must seize every opportunity that history has to offer.

Talking about access to great powers of the world that Estonia gets in the daily dealings at the UNSC — I have always thought that the fact that we do not see the world in a similar way to Russia is not a reason not to communicate. In fact, I would like us to have a much closer relationship just because you have to know the counterpart in order to argue with him. This is our neighbouring country, and our European allies and partners are relying on our expertise in dealing with the region. If we build a wall between us and do not communicate, then we do not have that expertise. In fact, we have had high-level contacts with both China and Russia before joining the UN Security Council, myself included, but I admit that our diplomats certainly have a better idea now of how their diplomats operate and also of the UN Security Council's own working methods. It is of great value to understand the work of diplomats from large countries as well.

The UN will turn 75-years-old — will the lessons of 2020 lead to a new era for the UN? In Estonia, you aspire to solidarity and a seamless society — can this ideal be translated into international relations as well?

We are seeing more regional solidarity worldwide. For example, in Africa the democratic process at the national level has not been very successful, but when we look at the supranational process — the African Union — everyone there understands very well that if the rules are not followed, there can be no economic cooperation. They are working for the free movement of people in Africa, ending human trafficking within Africa, because human trafficking cannot exist if you can work freely everywhere else. This will allow better resource allocation and create jobs. When it all works, we will see a kind of reverse process in Africa — top-down democracy. We also see similar regional cooperation - precisely the readiness of diplomats to work on behalf of the whole region — in the Caribbean or the Pacific Islands. Such regional cooperation brings together a somewhat more coherent world policy at the UN level.

If the United Nations takes advantage of modern diplomacy, which is more personal, faster, more direct, it has a great chance of remaining the most important international organisation in the world.

A conversation starter in cyber defence

By Maris Hellrand



Photos by CCDCOE

The NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE) is a multinational and interdisciplinary cyber defence hub that was established in Tallinn in 2008. The NATO-accredited think tank brings together researchers, analysts and educators from the military, government, academia and industry to provide a 360-degree-look at cyber defence.

Life in Estonia **interviewed Colonel Jaak Tarien, a US-educated former commander of the Estonian Air Force, who has led the CCDCOE since September 2018.**

Colonel Jaak Tarien, Director of the CCDCOE, addressing the guests of CyCon in 2019



Members of the CCDCOE

Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, the United Kingdom and the United States.



Colonel Tarien, looking back at the 12 years, what are the biggest achievements of CCDCOE so far?

Estonia already proposed establishing the NATO centre of excellence based on the Estonian cyber defence unit in 2004, the year we joined NATO. Initially, the proposal generated little interest amongst the allies, while Estonian Defence Forces continued with the development of the future COE. But then, the cyber-attacks against Estonia in 2007 were the best advertising campaign for the centre. Firstly, they demonstrated that cyber-attacks can endanger state sovereignty and, secondly, that Estonia has competence in cyber defence. We managed really well to avert these massive attacks. That's why the call was answered in 2008 and the first member states joined the centre. Russia did the job of convincing with its cyber-attacks.

Among the 25 NATO centres of excellence, the CCDCOE has the largest number of members today — both states and people. This in itself is a sign of quality. Our main areas are research, training and exercises. The **Tallinn Manual** and **Tallinn Manual 2.0** are probably the best-known legal analyses of international cyberspace law in the world. These are respected publications being quoted in every debate on international cyber laws today. The issues of legislation in cyber space are developing constantly and member states are expecting that we keep updating the manuals.

As an independent think tank, we operate outside of NATO command structure and, as such, have had the privilege and opportunity to raise issues that are not yet officially on the agenda. We raised the question of cyber-attacks and state sovereignty in 2008, which wasn't a widely-noted concept at the time but finally made it into the declaration of NATO summit in 2014. We have talked about cyber-attacks that states need to prepare for as well as cyber defence. Only within the last two years have NATO member states confirmed their preparedness for cyber-attacks if needed. We have held the exercise Crossed Swords for 6 years where we train cyber-attacks techniques. In order to be effective on modern battle fields, we can't just remain in a defence position but have to be able to attack. We saw this as a need and started this exercise. We have been a frontrunner in raising topics that sooner or later appear on the agenda of NATO.

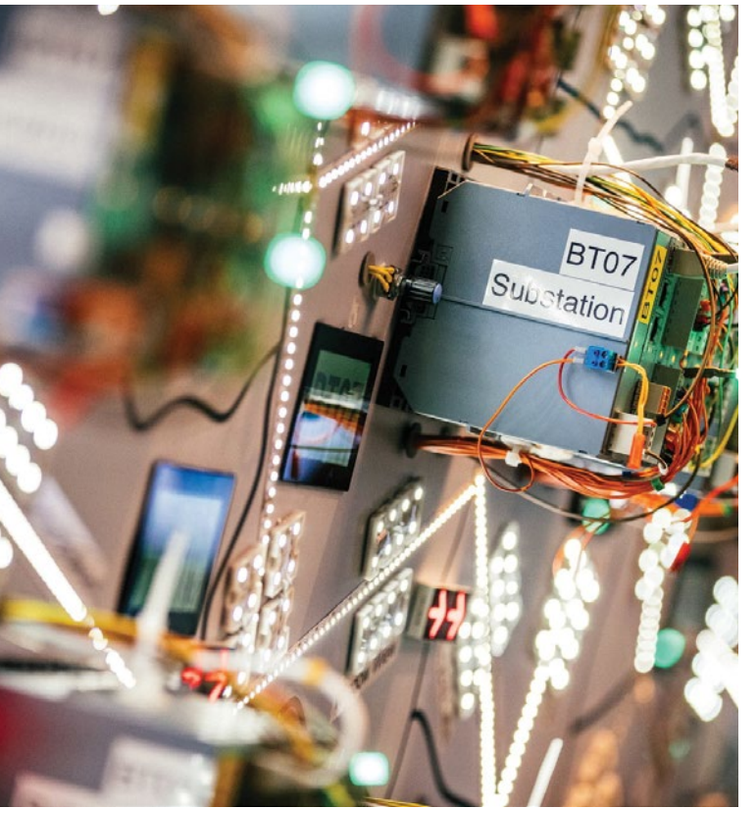
The flagship cyber defence exercise Locked Shields has been organised since 2010 and has become the highlight event of the cyber community. What makes it special?

Within ten years, exercise **Locked Shields** has grown from a small local event to the biggest and most complex international live-fire cyber exercise. While usually cyber exercises use simulations of computer networks, Locked Shields involves as many real-life systems as possible. Thanks to industry partners like **Siemens**, we can actually practice with real technology. Siemens has brought its technology to the exercise to serve as the "target" for the attackers and defence object for the defenders, who can practice defending real systems. We have had communication systems, drones, maritime monitoring, water purification systems — real life that can be practiced on as realistically as possible.



The CyCon 2021 "Going Viral" conference will take place in May 2021 — either in the usual format or a hybrid version with some participants present physically and others virtually.

We welcome all strategic, legal and technical topics on the impact that viral events can have on our military forces, economies and societies.





We have partnered with Estonian defence industry companies like **Milrem Robotics**, **Threod Systems**, and **Cybernetica**, who have included their products in our exercises. Locked Shields brings together a parade of VIPs, making it a marketing opportunity for the companies and offering the challenge of product development at the same time.

Locked Shields brings more than 400 people into one command centre along with more than 1000 people gathering in teams of 50-100 around the world. This spring we had to cancel the exercise due to the pandemic in order to avoid endangering the health of the world's best cyber defence experts. Now we are planning two versions: the regular exercise and a COVID-version. We really hope that the world will overcome the pandemic and we can hold a regular exercise in April 2021. If not, we will have to prepare for a different format both here and in the participating countries, according to their situations.

In 2008, many countries had to be convinced that cyber defence is an important part of security. Assuming that this has been widely understood by now, what are the biggest challenges of the field today?

Today, we have to make sure to keep our focus. The cyber-attacks come from state actors but also from usual criminals, they attack state systems and private companies as well; the lines have become quite vague. Some state attackers, like the North Korean hackers sometimes just act as common thieves who want to make money for their state — we remember the Sony hack or the Wannacry virus that were developed by state structures of North Korea to make money. We have to keep focus on defence forces and security while keeping in mind that the cyberspace is indivisible and we have to look a little broader at state security in cyberspace as a whole.

The 2014 NATO summit declared that cyber-attacks against a member state are considered a reason for the NATO collective defence mechanism to be implemented and that they can be countered by cyber measures or the usual kinetic measures. If a member state is attacked in cyber space, resulting in human casualties or substantial material losses, the collective defence will kick in. So far, this has luckily not come to pass, which is clearly due to the deterrence effect of the decision. This was the message to potential attackers: be careful, you might face collective defence of NATO.

Photo by Raul Mee

Building trust on the Internet

By Erik Aru

You've probably never wondered how identity verification on online platforms such as Airbnb, Uber, and others, works. Well, there is a company out there thinking hard about it and hoping to build trust in the online world.



Kaarel Kotkas

Many startup founders dream of selling out. Finding somebody who is willing to pay hard cash or stocks for their company and living happily ever after. But not **Kaarel Kotkas**, the founder and CEO of Estonian identity verification startup **Veriff**. Although he was offered a handsome payoff a few years ago, he is more interested in building things. His ambition is to build something quite intangible. "We wish to build trust in the online world," Kotkas says.

Trust is one of the foundations for businesses. If you have trust, companies from surprising industries can come online.

With the rise of the Internet, at first, people lauded its anonymity, as many do now. But as the internet has become more and more commercialised, anonymity has its obvious drawbacks. How can you tell whether the person you're dealing with is who they claim to be?

"Verifying an identity is definitely more important than finding answers on Google," Kotkas quips. "This shows you the scale and potential of this field."

One estimate puts the size of the identity verification market at 15 billion dollars: "How do we know how large the market is?" Kotkas asks rhetorically. "We really don't." But there are about 250 million companies with over 20 employees worldwide, yet the majority (95%) of all transactions take place offline.

A person's true identity might not be so crucial when selling a few books or CDs online, however, it becomes vital when we are talking about Fintech applications. For example, the providers of financial services have to be certain of the identities of those with whom they are doing business. Even if the companies themselves prefer not to know, they are legally obligated to meet anti-money-laundering legal requirements, for example.

That is where startups providing identity verification services — like Veriff — come into play. "We help to create trusting client relationships in the online world," Kotkas says.

Veriff starts with the notion that the most trusted proof of somebody's identity is their government-issued ID. One possibility would be to merely fulfil the criterion of providing an ID. A picture of an ID is uploaded and that's that. Many companies are quite satisfied with this. But not Veriff.

Veriff users go through a live verification session during which they are required to take a picture of themselves and their documents, which will then be compared to their face. With the help of artificial intelligence, Veriff analyses thousands of technological and behavioural variables in seconds to make sure that the person is who they claim to be and that they are not involved in any fraudulent activity. As a part of the process, Veriff records a video of the verification, looks at the network and device data that the person is using and makes sure that they are conducting the procedure of their own free will, not under coercion. Of course, no technology is completely fraud-proof, but Veriff claims that deceiving its software is thousands of times more expensive than the price of goods or services that could be acquired by doing so.

Obviously, Veriff is not the only player in the market. Kotkas remains positive about the competition. "Since we are not the only player in the field, it shows that there is a market for the service," he points out. "We all have our different solutions that fit different clients' needs. Veriff stands out for its highly automated product and great fraud prevention features."

Entrepreneurial mindset from early on

Kotkas was born in Emmaste, a 200-person village on the island of Hiiumaa, on the west coast of Estonia. The farm on which he grew up had dozens of Hereford cows, sheep and a horse. Kotkas says that working on the farm taught him discipline — there are some jobs that you just have to do, no matter what.

Some say that Kaarel is a serial entrepreneur; Veriff is his 12th business project. He was already demonstrating the first signs of his entrepreneurial mindset on Hiiumaa. He is a persistent guy who has always had objectives and ways to realise them. At a young age, he dreamed of a new BMX bike. At first, he approached some neighbours who came to Hiiumaa for weekends in the summer and proposed that he could mow their lawns for them. Later, other projects followed: making mulch and wine bottle holders, chartering sailboats, launching a platform for short-term jobs, selling power banks and so on.

Sports, windsurfing to be exact, brought him to Tallinn because the best training facilities in Estonia were there. He enrolled in the Tallinn Secondary School of Science, one of Estonia's top high schools. Kotkas lauds the motivating environment the school had.

In high school, he discovered a new interest — IT. "All of the sudden I had so much free time, unlike on the farm where you always have something to do." Kaarel does not consider himself to be a developer. "Veriff has lots of talent and there are many much better programmers than I," he adds.



Photo by Raul Mee

His plan was to become a doctor and study medicine at the University of Tartu. Life had other plans however, and he ended up defeating global, online identity fraud instead. He founded Veriff shortly after high school and went to study business at the Estonian Business School rather than fully focus on IT.

Finding the right people is the key

Kotkas' interest in identity verification and online fraud was triggered by a case study that he was conducting for the Estonian Fintech startup **TransferWise**. He likes to break things into small pieces, which is how he approached identity verification. Looking at the pieces, he found a solution.

"Everything starts with finding talented and entrepreneurial people who see an environment where making great things and taking extra steps are appreciated," Kotkas believes. "When all these excited, talented people, already over 230 of them as we have now, are moving towards a single goal, you can make great things happen."

When Kotkas started building the Veriff team, the first employees were carefully handpicked and had wide personal networks. "We approached people I had dreamed of working with one day," Kotkas says. "If you have such people in your team, they attract like-minded people. Over 30% of Veriff's employees were found with the help of our teams' personal references," he adds.

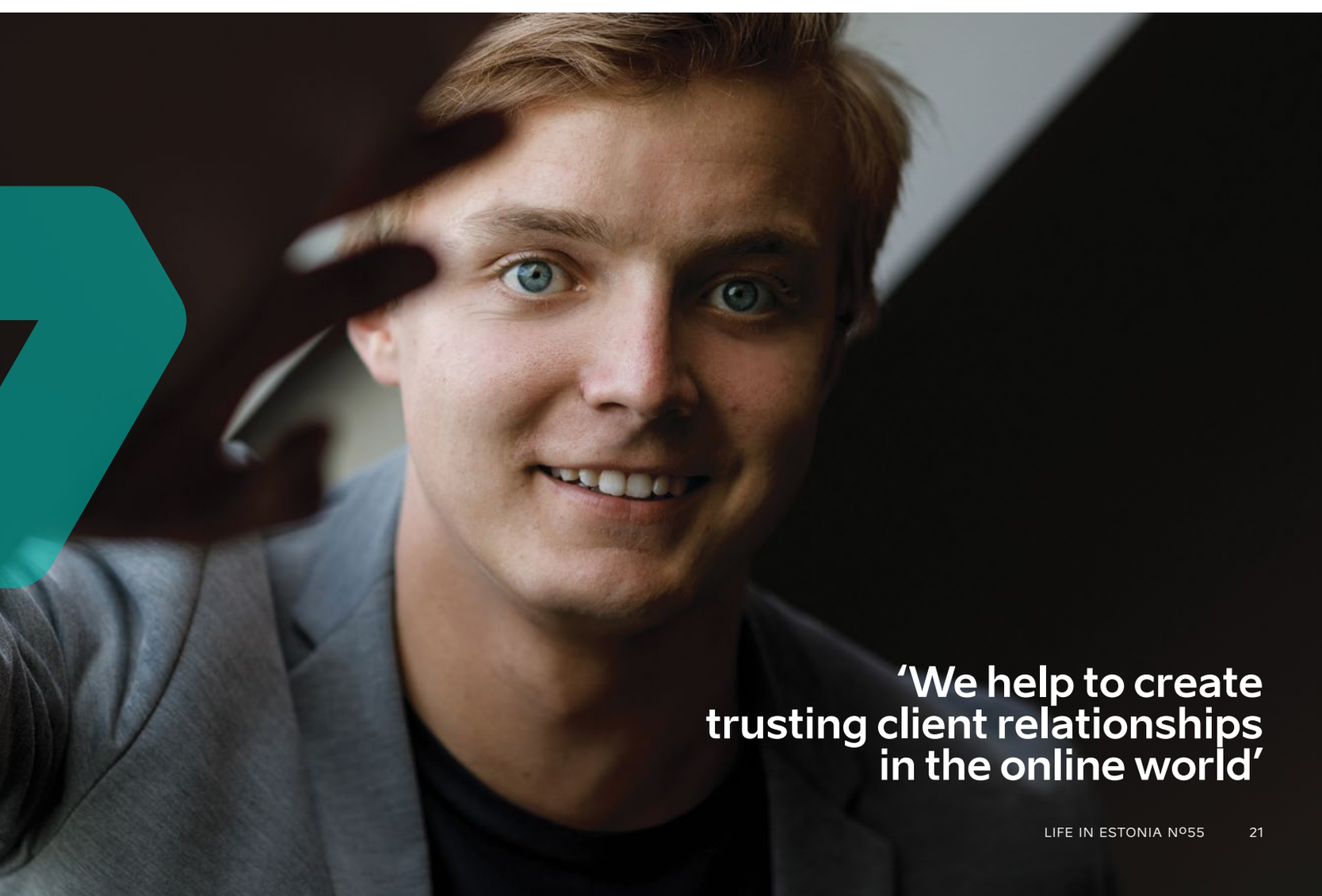


Photo by Jake Farra

Taavet Hinrikus

Co-founder of TransferWise

"Kaarel was doing a case study for TransferWise some 5 years ago. Because of this case study, he messed up his state exam in Math and failed to pursue medical studies that he had his heart set on. Even worse, he didn't get the job in TransferWise. But looking at it today, I am glad that things went the way they did. Kaarel, being a passionate guy, dedicated all his energy to developing Veriff and became a much bolder and hungrier version of himself. About 2 years ago, he demonstrated incredible persistence and creativity to seek me out again. We talked about Veriff and I saw great potential in the company. Looking at the amazing speed of development that Veriff has gone through during a short period of time, I can only imagine where he's going to be in 10 years with Veriff. Even though he still might be young and green, he learns fast and has all it takes to build great things. He's definitely on the right track."



'We help to create trusting client relationships in the online world'

Today, the company has people from over 34 different nations. “I really enjoy being in the office, learning new things from people who come with their novel ideas and offer a different approach,” Kotkas says. “Our ambition is to maintain this global reach,” he declares.

From banking to smart city projects

Most of Veriff’s employees are located in Tallinn and Tartu but, last autumn, the company also opened an office in New York to be closer to its global clients. You might be in a business where most things can be solved online, but you need to have face to face meetings with your potential customers — the businesses that offer services that need to verify their end-users — you have to be close to them.

Veriff started offering its services to traditional banks in Estonia, proving the concept. After that, it moved on to Fintech, marketplaces, the sharing economy and cryptofinance. However, the COVID-19 global crises accelerated digitalization and changed the IDV business a great deal. Now identity verification is an integral part of any online business that needs to verify the person at the other end of the line.

“We see a lot of possibilities and potential use cases in industries that will grow in volume over the next few years. These industries include telemedicine, education, video conferencing & communications and legaltech, just to name a few, where identity verification is going to be a vital part of the business,” Kotkas explained.

Last summer, Veriff partnered up with Berlin’s main public transport company **Berliner Verkehrsbetriebe (BVG)** when they launched their mobility app **Jelbi**, which covers Berlin’s entire public transportation system including scooters, bikes, ride-hailing and car sharing, as well as traditional taxis. Veriff comes in when people need to verify their identity and prove that they have a valid drivers’ licence. Veriff’s other global clients include the shared mobility provider **goUrban** from Vienna, the Fintech unicorn **TransferWise**, **Mintos**, **Blockchain** and more.

First we take Berlin, then we take Manhattan

Veriff can verify people from more than 190 countries, as well as over 8000 different document types, however, a lot of the verifications come from the US and the UK, so this is where Veriff sees the market potential. It is only natural that the company’s focus is moving in that direction.

“We are working more and more to be there for our US clients,” Kotkas says. “The first large-scale clients will need the most work, and later the others will follow and it should be easier.” During the last two years, he spent 8 months in the US, building a team there and working with customers. But it really does not matter where he is physically located, he has to work in both Estonian and American time zones anyhow. The price, obviously, is long working hours and not much sleep. Now, since the COVID-19 crisis hit in March, there’s been no travelling and all business has moved online.

The smallness of Estonia has been a necessary stimulus to think globally. “To fulfil our ambitions, we should verify every Estonian several times a day.”

Being from Estonia is a definite plus in IT circles, Kotkas says. Firstly, everyone knows **Skype.** Secondly, in the field of state e-solutions such as e-Identity, Estonia is a well-known pioneer. So, people consider it logical that a startup dealing with identity verification might come from there. “Estonia is much larger than it is physically,” he says. “It is a great opportunity but also a huge responsibility that we have to do our best to preserve.”

Veriff’s longer-term ambition is to create a single global identity for everyone on earth. “The more globally we work, the more we see that the security level of ID documents varies from country to country,” Kotkas explains. “We also see that, in many places, access to ID documents is more difficult. As we strive for a borderless world, we want to make sure that, with the help of Veriff’s identification, people get access to different digital services no matter where they are from.”



At heart, still a boy from Hiiumaa

You might be a global hotshot but that does not count for much among the people in Kotkas' native Hiiumaa. You can only become a true native by birth on Hiiumaa, no others will be considered native by locals. So Kotkas is understandably a bit troubled by jokes of his relatives who tell him that they will strip him of his local's status because he has been away for too many years. "I definitely want to go back there," Kotkas says. "When the ferry lands at Hiiumaa and you drive off the ramp, your heartbeat already slows down — you feel that you are at home."

Veriff was founded in 2015 by then 20-year-old Kaarel Kotkas. This year, Kaarel Kotkas was awarded the EY Entrepreneur Of The Year. His company is now one of the fastest growing startups in Estonia, providing web and mobile identity verification solutions that help reduce online identity fraud and theft. In July, Veriff announced a 15.5 M USD financing round that brings the total financing of the company to 23.8M USD.

Photos by Raul Mee



'Veriff's longer-term ambition is to create a single global identity for everyone on earth'

Entify cuts KYC report times from eternity to minutes

By Ronald Liive



One of the main missions of any business is to expand its client portfolio. Depending on the field in which the company is operating, the task in question could be very difficult. Not because there aren't any potential customers left in the market but rather due to anti-money laundering (AML) regulations and financial fraud prevention.

Neeme Org

Compliance with AML can be a rather hard task for small to medium-size businesses and costly for businesses of any size. Thankfully, there is a simpler solution in the form of the startup Entify, which promises to cut the time it takes to onboard international customers from weeks to minutes. Entify produces a Know Your Customer (KYC) report in just one click.

Entify's CEO and co-founder **Neeme Org** describes the service as an automated KYC service for businesses. According to Org, there aren't a lot of companies in the world that deal with AML, especially with a fully automated process.

"Broadly speaking, we are solving two problems, the first being compliance with legislation and AML regulations. This must be followed by regulated companies for example financial institutions, notaries, lawyers, etc. The other side is anti-fraud or the fight against criminals," describes Org.

Org and the team behind Entify have been either directly or indirectly involved with AML questions for over twenty years — well before AML regulations were officially put on paper.

"We founded the company a bit over one and a half years ago. We quickly raised series A funding and are actively raising another round in the near future. We have a desire to expand the business outside of Europe, mainly into the United States of America. Our service is global already but we are eager to focus on the US market and we are planning to open an office in the financial heart of New York: Wall Street."

One of the main reasons for Entify to expand into the States was the fact that about 60% of their potential customers were and are still located in and around Wall Street.

Entify has many different solutions for how their clients can search for information in regard to a company in question. The solutions vary in the needs and expertise of the customer. The system produces a report that includes information about the private persons who have stated their ties with the company at hand, shows whether the private persons or the company itself are under any sanctions, reveals whether the private persons are politically exposed persons (PEP) or have ties with PEPs, as well as whether there has been any negative press about any parties involved with the company.

The report can be produced in as little as 15 minutes. According to Org, their competitors take at least two weeks to produce a similar report. A report that takes only 15 minutes to produce can be given out for companies that are registered in Europe. For other parts of the world, the report takes a bit longer.

Entify does not state in the report whether the potential business partner is a risk for business or not. That difficult decision is up to their clients but the report will give an overview of the positive and negative aspects to consider in decision-making.

Although the Estonian Business Register is quite advanced and a lot of the given examples can be found from the registry in minutes, the same can't be said about other countries according to Org.

"We start with the Business Registry, but that doesn't give all of the information we are interested in. We gather information from various databases, the reports rely on the integration of different databases and the cross-opposition of the information gathered from them. Our mission is to give an option to small and medium-size companies not to hire an in-house AML compliance team, which is expensive to upkeep and hard to staff, as there aren't a lot of universities in the world producing AML experts."

Org gives the example of why one would want to produce their own sugary drinks in their office for the employees to consume when they could buy well-established brands drink from the shop.

In regard to PEPs and sanctions, it's understandable that the information is available through various databases, but how can Entify produce a company or person's negative press in a mere 15 minutes? The CEO assures that they do not only look for certain keywords but also use well-established sources to help them monitor bad press.

"Often, our clients find us after they have fallen victim to a scam or have been given many notices from regulators. Or when the companies finally realise that our service is not just a convenience service but a must."

Org doesn't want to disclose the number of Entify's clients, but he emphasises that they include Fintech companies, law firms, crypto-oriented companies and insurance companies in their portfolio. Right now, the core of their clients are companies that are focused on Estonia, Latvia and Lithuania, but during the COVID-19 situation their client-base has expanded outside the area.

He gives the example of one of their customers that stepped into business with a Ukrainian company from the food industry. Although the new business partner had a nice webpage and a Google search for information gave a lot of results, they did not pay for the delivered goods. Afterwards, it came to light that it was not a legitimate business.

How frequently reports are made is up to the customer. In practice, a report can be produced daily but Org doesn't see that it would be a reasonable option for all of their clients.

The need for Entify's service has grown during COVID-19, the CEO sees it as an opportunity. Before the pandemic, most of their clients were small to medium-size companies, but during these uncertain times they have gotten requests from bigger companies as well.

Entify got its start thanks to **Veriff**, another successful Estonian startup that offers an identity verification service. Org was an employee of Veriff when he came up with the idea of Entify.

"We do business in which it is very important that computers are better than humans. Let the computers work and leave the humans to do work where computers can't do it. Our main competitors are in-house compliance offices. So far as we know, there aren't any other fully-automated KYC compliance companies in the world," says the CEO in closing.

Visory turns your camera feed into data you can actually use

By Ann-Marii Nergi



Photo by Atko Januson

Did you know that by 2022 there will be over 44 billion cameras integrated into different appliances and environments in the world? Yet a large share of this incredible volume of collected data will be rendered useless, because nobody will manage to monitor or review those video streams, much less draw sensible conclusions from them or analyse them. The new Estonian artificial intelligence startup Visory aims to make this data work for our benefit, and it will do so by following the strictest data protection regulation.

Taavi Tammiste and Karen K Burns

The platform created by **Visory** works with anonymised video feeds, which are transferred by traffic- and security cameras, drones and other sources, in order to enable institutions and companies in the city to make data-based decisions in real-time.

The platform, which is based on machine-learning and machine-vision, analyses video- and photo footage and behavioural patterns in various environments (both city environments and interior environments), it enables the classification of traffic objects and mapping their trajectory and statistics dynamically in real-time. Every camera in the world can be connected to Visory and the setup is simple — camera owners can install it by themselves.

The creators of Visory emphasise anonymity and the principle that the data collected cannot be manipulated, should it come into the wrong hands. Co-founder and CTO **Taavi Tammiste** explains that their goal is to carry out analytics in a secure way. "Companies own their data — it's our responsibility to keep it secure. Before a video reaches us, we ensure that the details of objects cannot be identified."

Co-founder and CEO of Visory, **Karen K Burns**, emphasises that they began offering their platform in Europe, because the strictest data protection regulations apply here. If the service corresponds to the General Data Protection Regulation (GDPR) in Europe, it is consistent with the highest standards of individual protection currently in force in the world.

Last April, the company, which had been in existence for only a year, announced raising 250 000 euros from international investors via the Superangel Fund. Currently, the second round of investments is open; Visory will raise 1.5 million euros. "We will use the money to increase our technological capability and to expand the side of business development. There is enormous interest in our activities and we hardly have time to answer all inquiries. Therefore, we have to start employing data researchers and -analysts, and as our business is based on machine-vision and AI, we also need software developers," explains Tammiste.

One of the first target markets for the company is the United Kingdom, where the company already has a representative and negotiations are underway mainly in the real estate sector in addition to the public sector. Besides the UK, important countries include the Nordics, Germany and France, but the company is also preparing to move into Asian markets like South Korea, Japan and Singapore, which will be the next largest target market outside Europe.

Helping to fight the virus

Visory can also be utilised to monitor crisis situations, such as the current COVID-19 pandemic.

In the beginning of the fight against the spread of COVID-19, Visory offered free access to its platform for one month, so one could analyse its video feeds in real time: crucially, are people following advice and staying at home? How close together are they when outdoors or in shopping malls? And how does this correlate back to the data from your city or area on the spread of COVID-19?

With the Visory platform, it was possible to get movement analytics of people, stats and density detection. Visory's custom-built AI vision system is specifically trained to predict behaviours within urban technology environments. It helps to monitor maintaining social distance or hygiene behaviour and is thus one of the possible data sources for monitoring public health behaviour. Everybody knows that a picture says a thousand words — but Visory will multiply the 'thousand' many times.

One of the notable successes of Visory has been its participation in the prestigious **Dubai Future Foundation Accelerator** in the United Arab Emirates, where it was selected from more than 600 applicants. They worked together with the local Road and Transport Authority to create traffic statistics in Dubai. "We worked out a proximity solution — for example, we mapped places where car traffic and pedestrians were too close to each other. The pilot was successful. Due to COVID-19, the work of the accelerator was reorganised and we returned to Estonia, but the projects we started there and the contacts we gained will continue in the autumn in a slightly different format," says Burns.

There are numerous ways that Visory's technology can work for your company or the entire city. Karen Burns explains that during the spread of the Coronavirus, many owners of public property have approached them, whose concern has been to recreate a sense of safety for people.

"For example, in shopping centres, we can monitor live as well as by making predictions on the basis of previous measurement results showing how many people are in the shopping centre at a given time. Seeing the number on the display, each person is able to decide whether to go into the shopping centre in the current moment or return later."

A carpark management system has been installed in the Ülemiste City business park, where there are more than 1500 parking spaces in total. "People used to come to work at Ülemiste City in the morning and spend up to 15 minutes looking for somewhere to park! That is a lot of time that could have been put into better use by working. Now the cameras in the carparks use Visory and the displays show how many parking spaces are available and where." Visory can also be used for marina management, providing analytics and AI-powered real-time monitoring — computer vision AI automates and improves communication between the port and vessels.



Photos by Atko Januson

In the face of the current global challenges, many companies are reorganising how they conduct business, and digital identity is more fundamental than ever, for example, when offering secure online customer experiences, organising remote work for employees or allowing citizens to access secure government services.

These solutions are called Identity and Access Management solutions. For Martin Valler, they are his calling at Icefire.

Icefire helps companies create safe and seamless digital experiences

By Ronald Liive



Martin Valler

Icefire is a full-service digital transformation provider

Icefire's expertise lies in custom-tailored solutions for customers ranging from Fintech and telecom to e-government and healthcare. **Martin Valler** joined the team over four years ago, starting as a developer. He has been moving up the ranks over the years, reaching the position of Chief Technology Officer (CTO) just this past September.

Simply put, Icefire is a one-stop shop, from concept to final solution, while keeping the clients' business goals in mind. The company is engaged in business consultation, analysis, and development.

Icefire's clients include **LHV, Swedbank, Skype, Telia** and the **Tax and Customs Board** of the Republic of Estonia, just to name a few. Right now, two of the biggest projects that Martin himself is working on involve **Luminor Bank** and the private medical clinic **Confido**.

Person as a digital identity

One of the main subjects Valler is interested in right now is digital identity. Not in the sense of presence in social media but rather from the view of how to access e-services with one's digital identity.

"What we have seen over the years is that when a user wants to log in to a service there needs to be a so-called footprint about them in the system. The user needs to be described in the backend. The tricky part is when the user wants to use many different services. It's been common that a person has many usernames to access different services but, nowadays, it's more conventional to use a universal user across many different services," Valler describes.

How users authenticate themselves has changed over the years. It started off with simple passwords and has moved to multifactor authentication.

"Right now, the trend is toward a so-called adaptive authentication where a user's identity is being authenticated through their activities on a device. When did the user log in, where did they log in from, how did the login happen, how did the mouse move, how long did it take to type the password etc.? So, besides just asking for a password, the systems will look at those attributes and ask for multi-factor authentication only when their activity is not similar to their normal behaviour."

Users are more demanding

According to Valler, users have become more demanding in recent years, wanting to be logged in to any service that they would like to use after signing in to their computer. Facebook, Apple, Google etc. can provide these kinds of solutions, but those are not the right options for all e-services. For example, online banks are not eager to use them for privacy reasons.

As Icefire has worked on seven online bank solutions and is currently working on its eighth online bank, Valler can give good examples from that field.



Iwan Dijkstra, Account Executive for Nordics & Baltics, ForgeRock

ForgeRock – one platform, all identities, any cloud

ForgeRock, a privately held digital identity leader, helps people access the connected world. The company serves 1100 enterprise customers with the only full-suite, AI-driven identity platform for any cloud. Organisations select ForgeRock to help improve and scale all things identity, governance, and access management with push-button deployments that enable exceptional digital experiences with no-compromise security. The COVID-19 pandemic is impacting all parts of our lives. Businesses and governments alike are feeling the impact of a world gone online overnight. Systems are being tested — many companies are reporting traffic surges normally seen during World Cup matches. The effects are enormous and have put digital identity on the agenda inside boardrooms like never before. We are witnessing a shift in the way we live that will last for generations — none of us expect to go back to the old way of doing things. It's too convenient to shop online or see a doctor for a routine check via Zoom. The power of Amazon's 'buy now' button has trained us all to expect a purchase with one click and a package on your porch the next day. That digital experience is now the expectation of employees as well as consumers. Organisations have an opportunity to seize this moment and find their own path to offering their employees and customers an 'Amazon-like' experience. The ForgeRock Identity Platform can help organisations achieve that.

"Even though, after accessing an online bank the person thinks that all of the e-services are under one company and can be accessed right away, it is not always the truth. The leasing department could be under a subsidiary, which means the information about the user needs to move from one company to another. That means when data changes in one of them the data needs to change in the other one also. Can you imagine if, after accessing your bank online and while wanting to look for information regarding your home loan, you are asked to sign in again? Making it possible to access all of the services with one username you need to deploy a single sign-on (SSO) solution," Valler says.

When looking from the outside, it might seem that there are not a lot of e-services built upon multiple, smaller e-services, but Valler assures that, in the time of cloud solutions, more and more services work in the background while the user might not differentiate them right away. One example he gave was in regard to a potential customer Icefire was in talks with this year who had about 200 services they wanted to tie together with an SSO.

An SSO can be viewed as a convenience service for the user and a way to save money for the company; they don't need to operate many systems in the background in order to keep information about their clients.

DIY vs professional solution

"As security is something upon which the entire company relies, it has to be implemented correctly and using the most current capabilities. It is not something you would want to start creating from scratch as it covers development, integration, maintenance, upgrades and multiple other areas. Trying to do it on your own will lead to a situation where the company has no resources to do everyday business but has to concentrate mainly on the security solution," Valler says.

Valler's recent experience shows that it is a lot easier to use existing solutions on the market. For this exact reason, Icefire cooperates with **ForgeRock**, a company that provides a full platform for Identity and Access Management (IAM). As the large-scale project that Icefire and Forgerock are currently working on covers the Baltic market, the local digital identity solutions like Smart-ID and Mobile-ID were added to the platform to give the end-user the best digital experience.

Other parts of Europe have got catching up to do

Although Estonians, Latvians and Lithuanians are used to digital identity solutions, Icefire says it is hard to find a worker from one of their partner companies in Western Europe that has used their digital ID-card to access a service.

"People in Western Europe are not keen on using digital identity solutions because they fear what data is left behind and where the data ends up. In that regard, the Estonian e-Residency solution could be deployed worldwide, it offers an option to use digital identity. The technical capacity is there with e-Residency, the main questions will be: which states are eager to support it with legislation and are the people up for using it? People in the older parts of Europe are used to waiting in lines and filling physical forms. It doesn't need to be that way; there is an alternative. In Estonia, we managed to do it because the private and public sectors built digital identity together. Things that seem normal to us (Estonians) are still a future for others."

Valler sees the COVID-19 pandemic as a good example of how digital identity helped Estonians work from a distance. As all of the public and many of the private services are accessible online, there was no need to develop new systems for it. Other countries could have done the same but they would need to have a system for it.



Photo by Atko Januson

Guardtime turned trust into digital truth

By Ronald Liive

Trust is a vital part of society and has been made into a multi-trillion-dollar business. Audits, inspections, certificates and compliance measures have been developed to verify data. Guardtime solves the problem of trust differently and replaces it with digital truth.

Ain Aaviksoo

Guardtime has developed a system based on blockchain technology that can verify the correctness of data, networks, systems and processes with a mathematical proof called **KSI Blockchain**. With offices in Tallinn, Estonia and Lausanne, Switzerland, Guardtime has built 12 different enterprise products in the past 13 years, ranging from Telecom, Audit and Compliance, Cyber Range & Exercises and even Space and Health.

Guardtime helps to improve the European Space Agency's Cyber-Security capabilities

Having worked in various space-related positions in the public sector for years, **Marika Popp** joined Guardtime as the Head of Space Solutions about a year ago because "she wanted to sit on the opposite side of the table to see how private entities develop their technologies jointly with the **European Space Agency** (ESA)".

Roughly speaking, every project that Guardtime is working on in space is tied to the domain of space cybersecurity but each in its own specific way. For example, as software is today the integral part of every single satellite this has brought along new specific security challenges and dealing with those potential cyber-threats requires a completely different approach to those back on Earth.

To combat those threats, Guardtime was recently awarded a contract to leverage its cybersecurity expertise and technologies to improve the capabilities of ESA's **Cyber-Security Space Operations Centre (C-SOC)**. Popp said that Guardtime is currently mapping and evaluating the agency's cybersecurity capabilities while also identifying the future capabilities of what the C-SOC needs to address. This is the most palpable project that Popp has been working on with her team at the moment.

C-SOC is specifically designed and trimmed for the space sector. The centre will monitor ESA's space mission operations and assist in security incident response.

"The fact that Estonia has such a high ambition in the field of space cybersecurity is partly thanks to Estonian government's policy for ESA's membership. As an ESA member state for five years already, Estonia has had to decide which programs to participate in. Considering Estonia's background, cybersecurity has obviously been one of the priorities. In the foreseeable future, it's unlikely that Estonia would have the capacity to build orbital launch systems. However, if we talk about space data security, Estonia has a reference base that makes us a trustworthy partner for ESA and its member states," described Popp.

Having had several years of an active and successful collaboration with ESA has been a good selling point for Guardtime; for potential partners, it's proof that the company can be trusted and its technology does what it claims to be doing. Comparing Estonia with other ESA members that have colossal sums of money to invest, Popp says that Estonia's strength lies in carefully selecting its priorities and focussing on its existing strengths.

Space is a rather recent endeavour for Guardtime and Popp is looking for ways to actively extend Guardtime's product portfolio further to space. Its longest track record in this is related to the company's main products, a blockchain technology solution called KSI blockchain. Simply put, it's a technology that detects whether data has been manipulated by making hash out of the data and then comparing it to the original.

For example, the hash for "Life in Estonia" is 7f63138c4b2f999ca4acc6a4a73db229 but for "Life in e-Estonia" it would be 6ea00970ec07ffe6e01b6559ff9e3b39. As demonstrated, just with a small addition in the name the hash is totally different. Using a hash gives the confidence that no third party can see the data without authorisation.

This technology has the longest track record in collaboration between Guardtime and ESA to verify the integrity and provenance of ESA's Earth Observation (EO) data sets. Guardtime has a technology stack that can be used to upgrade and improve operational EO data archiving and processing systems and improve their cyber-security measures. In addition, Guardtime is also working on a prototype based on KSI to verify the satellite trajectory data for collision avoidance within the domain of Space Surveillance and Tracking.

Photo by Atko Januson



Marika Popp



Photo by Atko Januson

From space to health, KSI has a wide range of uses

The same KSI technology is also used by a team run by **Ain Aaviksoo**. He's been filling the position of Chief Medical Officer of **Guardtime Health** for about two years. Aaviksoo's career is admirable, he has worked as a physician at East-Tallinn Central Hospital, was a health policy researcher and consultant for the World Bank and dipped his toes into the public sector as Chief Information and Innovation Officer in the Estonian Ministry of Social Affairs. Due to his background, Aaviksoo is well-informed about what the public sector wants from the private sector and vice-versa.

The latest product Aaviksoo's team has been working on is called Real World Data Engine. To describe it, he says the engine provides aggregated reports across multiple health care providers in a privacy-preserving manner. To make it even more understandable, Aaviksoo states that the system makes health data queries from everyday health care institutions, such as hospitals and family physicians.

Guardtime's **Real World Data Engine** makes it possible to make the information behind the data available to the related parties without the specific data from moving outside of the medical institution. The producer of the drug can ask the engine how many patients achieved the promised outcome and complied with the conditions of the prescription. The data is based on actual data from real healthcare environment, as the name suggests, and the results are given in an aggregated form without any personal data processing being done at all.

Guardtime has already partnered with ten leading pharmaceutical companies led by **Roche** and **AstraZeneca** who will use the engine to cause a paradigm change in drug pricing with the ultimate aim of realising outcomes-based contracting. According to Aaviksoo, both the healthcare payers and pharmaceutical companies have been looking for indication-based and combination-based pricing systems, which would mean drugs no longer have fixed prices but change in every case.

To achieve this, Guardtime combines two of their technologies: a multi-party computation technique and the KSI blockchain. With these tools, Aaviksoo is certain his team can solve the two main hurdles that have prevented patient data privacy, scalability and sustainability.

"It is not always possible to actually achieve the results found in clinical trials. Patients in clinical trials are a very specific group. Most of those who actually start using the medicine have a variety of coexisting conditions and confounding circumstances that can affect the outcome of treatment. The usual prognosis is given by the group average, in real life it could be different. Right now, it's impossible to measure whether the outcome is achieved or not. Yes, the specific doctor sees the result but that information is kept from the pharmaceutical company and healthcare payer," described Aaviksoo.

For example, the same drug can be used for the treatment of breast and pancreatic cancer but it could cost less for one of the treatments because the impact/value of the drug is different. To use the indication and combination-based pricing system, there needs to be a system in place for the drug manufacturers to control whether the drug is used as prescribed and where the conditions are filled.

Luckily for Guardtime, pharmaceutical companies and medical institutions have understood that there is no point in having separate databases for every pharma. Thanks to COVID-19, awareness has been raised that data is needed in the health sector.

"In order to know which treatment method is most appropriate, it would be necessary to compare the actual treatment used in different groups, so that effective treatment would be better rewarded and it would reach more and more patients," said Aaviksoo. He adds that it is the main reason Guardtime is involved in this project. Pharmas have also found other possible use-cases for the same solution.

Yellow Card will see a digital transformation thanks to Guardtime

Another project Guardtime ventured into recently was initiated due to COVID-19. With the help of the World Health Organisation (WHO), the company is making the **Carte Jaune** (ICV) or **Yellow Card** digital. Not in the sense that the physical card, which carries all of the information about the vaccinations a person has, will be made obsolete; rather with the aim of restoring normality in the world.

Right now, Aaviksoo says that the card itself will remain as a physical card. However, one day in the near future, every person will have a unique QR code certifying whether they have received a Covid-19 vaccination or not. Looking at the travel restrictions put in place in many countries, having a certified vaccination when entering a country could be the new reality next year.

Due to the fact that WHO is involved with the project, Guardtime has to keep in mind that the system created needs to be simple enough to work worldwide aand operate in countries without sophisticated information systems that can house the information in question.

"The same system can be used to secure the supply chain, for example, if a vaccine is intended for sale in Estonia, it must not be sold anywhere else. Guardtime's system can detect the development of fake vaccines, meaning that their administration and sale to other countries becomes meaningless," said Aaviksoo.

Just like with the Real World Data Engine, Guardtime keeps privacy as the cornerstone while developing the digital version of ICV. Aaviksoo gives the example of entering a foreign country and being asked for the ICV: the border-guard will only get a simple yes or no to the question of whether the person is vaccinated from the document that the person is presenting. No digital queries or integrations to outside databases are needed.

How one meeting in Geneva opened doors for Guardtime and Estonia in general

On October the 5th, Estonian Prime Minister **Jüri Ratas** and Director-General of WHO **Dr Tedros Adhanom Ghebreyesus** signed a Memorandum of Understanding regarding cooperation in the fields of Digital Health and Innovation. With pride, **Marten Kaevats** can call himself the architect behind it: he was the person that started the chain of events that led to the signing of the memorandum.

Kaevats is the National Digital Advisor to the Government Office of Estonia. On one of his work trips to Geneva, Switzerland in spring of last year, he was introduced to Dr Soumya Swaminathan, the Chief Scientist at WHO. After networking, Kaevats visited her office the next day and made a two-hour long presentation about the e-solutions currently used in Estonia as well as those coming in the near future. After the meeting, on Swaminathan's personal recommendation, Kaevats joined the Digital Health Technical Advisory Group at WHO.

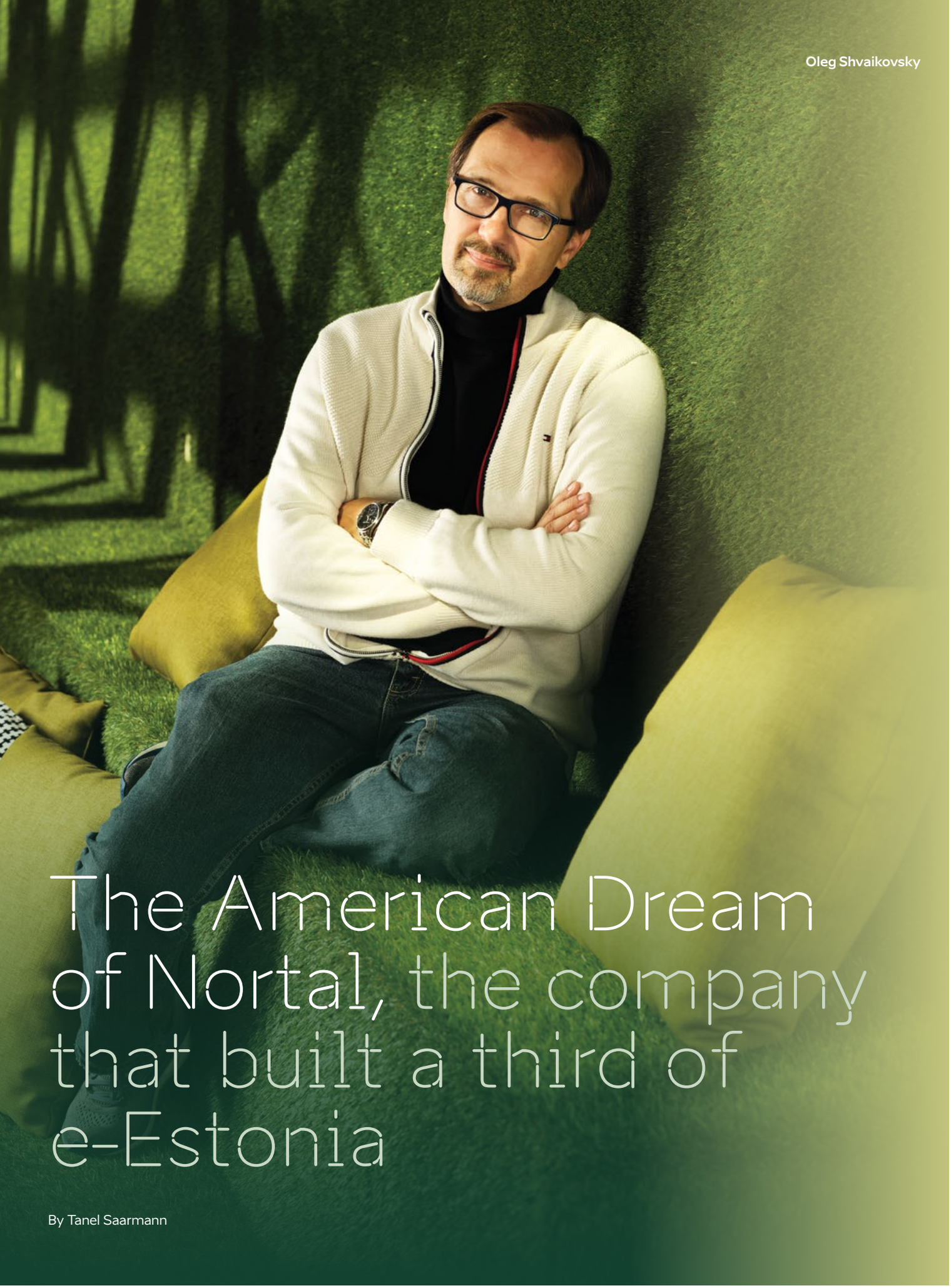
"WHO is looking for their role in the digital health field. They haven't had any big success yet. The high-level Advisory Group consists of top experts from all over the world, many of which are doctors. I was frank with them during our first meeting that I don't know anything about health as that's not my field of expertise but I do know about interoperability. Simply put, interoperability is like Estonia's X-Road. After our first meeting it was decided that I would lead the interoperability part of the Advisory Group," explained Kaevats with joviality and cheerfulness in his voice.

Anyone that has met Kaevats knows he is not the typical public sector employee. He is always energetic, often embellishes his business attire with bright yellow or red sunglasses and talks with officials and journalists like friends. But don't let the looks fool you, in just short years he has managed to prove to the government that self-driving cars need to be allowed on Estonian public roads and that Estonia needs to legalise Artificial Intelligence (AI).

In the Advisory Group, he started to work on the question of how to move health data cross-border, bearing in mind that WHO has 194 member states. To make it a reality, Kaevats made around 20 visits to WHO's office in Geneva up until February. He got to know the personnel there and organised many workshops to map out different use-cases. The one eventually selected for proof of concept (POC) was not initially at the top of the list but the COVID-19 situation suddenly made it the most important issue.

Kaevats hopes that the Yellow Card POC is a stepping stone for Estonia and will open many more doors for Estonian companies to collaborate on projects with WHO, some of which are already in the works.

Guardtime is not getting any monetary compensation from WHO or the Estonian Government for developing the POC.



Oleg Shvaikovsky

Photo by Atko Januson

The American Dream of Nortal, the company that built a third of e-Estonia

By Tanel Saarmann

Photo by Silver Gutmann



In 2017, Nortal touched down on the western coast of the USA. Today, they can boast several Fortune500 companies among their clients.

Three years ago, **Oleg Shvaikovsky**, one of the board members of **Nortal**, began travelling between Estonia and Seattle in the northern part of the US West Coast. The time difference caused some sleeping disturbances and, at the time, he was unaware of how right this move would turn out to be for the company. The IT-centre of Washington state is the mecca of world cloud technology. However, the first steps towards Nortal's American dream can be traced even further.

Shvaikovsky talks about **Elastic Path** — a large e-commerce platform provider and a good old partner of Nortal — which has its headquarters in Vancouver, Canada. Vancouver is a mere two-hour drive away from Seattle.

"We have been their long-standing partner in implementation and supporting services in Europe, especially in the Netherlands and Sweden. The company invited us to participate in an exciting procurement. It took us to Miami, Florida and to the largest cruise company in the world — Carnival Cruises," begins Shvaikovsky. Albeit a subcontract, it was the first contract on the large continent. The practical work was carried out by Nortal employees in Estonia and Lithuania.

The jackpot came in the form of a new client — one of the largest mobile operators in the USA, which back then ranked third in the United States but today is closing in as the market leader.

"Using the Elastic Path platform, we began to create a B2B e-commerce system and, later on, a retail customer solution for them. This has been an enormous project and our collaboration is developing and expanding," says Shvaikovsky.

Nortal's operations apply the following logic — after being convinced of the relevance of the service for local clients, you enter the market and set up a representation which you will develop whilst simultaneously hiring staff and looking for more clients. Subsequently, you will look for opportunities for organic growth on the road to M&A (mergers & acquisitions). Nortal's decision-makers understood quickly in the USA that one cannot create waves in the same way on a large market. In order to make the developmental leap, you need someone with the local know-how, team and customers. The aim was to acquire a strong and acclaimed player on the local market. After a long process, two companies made it to the final and the deal was made with **Dev9**. This was the step that put Nortal on the map.

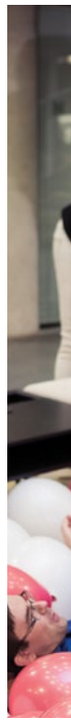
Nortal's DNA was taken to the USA

Today, the Seattle office has grown to nearly a hundred employees. Nortal believes in the synergy that their branches in different states are able to create. Dev9 was one of the leaders in the cloud transformation field in their country and this know-how has been transferred to Nortal's European offices.

"They are fantastic in that and they've always been a step or two ahead of their counterparts in Europe. Therefore, we have brought our US people to our offices in Finland in order to transfer knowledge. We exchange best practices and know-how," says Shvaikovsky.



Photos by Silver Gutmann



Tallinn office celebrating Dev9 joining the Nortal family

Shvaikovsky adds that, in turn, they took Nortal's way of doing business to the United States. An important principle is that nobody in the company is playing the role of the boss; a general hands-on approach applies to everyone. The second important keyword is 'entrepreneurship', which means the ability to improvise and to show initiative. They work on the so-called fast fail principle, meaning you will work from the basis of best knowledge and analysis, but if something is not working, you will find an alternative fast. The aim is always to find the best possible solution. "It does not mean that you are not good enough. It means probably that the approach was not right. What we learn from our attempts and how we move on are what matter," he says.

Seattle on the way up

Why did they choose Seattle as their landing place? Partially, it was chance because their important partner was active in Vancouver and their first client came from Seattle. At the same time, Seattle is a very exciting location. Shvaikovsky points out that albeit in the context of tech companies people only talk about Silicon Valley, Seattle is where many technology giants and other players are located. Among others, the headquarters of Boeing, Amazon, Microsoft, Starbucks and T-Mobile are based there.

"Seattle attracts cloud topics. It is the second ranking tech hub in the USA, but after the current crisis it may turn out to be the main location. The global giants Microsoft, Amazon and Google have chosen Seattle as the place where their cloud solutions are created," he emphasises.

As an Estonian company in the USA

Oleg Shvaikovsky admits that it is not easy for a company from a small and relatively unknown country to make it in the USA. Generally, Estonia has a good reputation in certain circles. Those who have dealings with Microsoft know about their connection with Skype. Nevertheless, Nortal has been an unknown name until now. Yet it is not general awareness that matters, but being known in a specific community and, in this field, it is the people, talents and inspiring experts that matter. They are the ones who make big projects happen and attract employees and customers. At first, Nortal's recruiters needed 30–45 minutes in order to introduce Nortal and Estonia to potential employees.

"Today, we are starting to make a name for ourselves. Estonia's reputation in e-state projects is strong. In the USA, we have a unique market — we do not have a single public project. This is likely to remain so in the near future. But our clients include several Fortune500 companies," says Shvaikovsky. This is indeed a great thing, considering that Nortal is not offering the cheapest price. The company works on the principle that they are working in accordance with local rules, they offer a top level service and, hence, also charge appropriate prices. This also means that expectations on them are as high as expectations of local companies.

"Our most impressive competitor in this area, which mostly works only in Seattle, has 7000 staff. Nortal, with its 1000 employees, is a small player," says Shvaikovsky. However, the company is growing organically together with the increase in clients.

Nortal has built many e-state solutions

Nortal, which gets its name from the words Nordic and Talent, offers the service of data-based simplification of business processes for both public and private sector clients. Nearly a third of the Estonian e-government solutions have been developed by Nortal and its predecessor Webmedia.

For example, in Estonia the company has created the operative system of structural funds for the Ministry of Finance and the employment information system for the Employment Board. Other significant goalposts have been the e-Tax Board and e-Health solutions for the country. The most recent e-state innovation — the proactive services of the Social Security Board — have also been created by Nortal. Since 2005, the company has gradually taken its know-how abroad and, today, already ca 75% of the turnover of Nortal comes from outside Estonia.

In Oman, where Nortal has been active since 2008, the company is helping to reform the state and create an e-state. This is not simply software development, but the application of a best practice from Estonia. Among other things, Nortal has created an e-tax system for the Oman Tax Board and the portal Invest Easy for entrepreneurs.

In Finland, Nortal works with large industrial clients like Neste, Boliden and Outukompu in addition to the public- and healthcare sector. This summer, Nortal launched an e-prescription pilot project in Hessen, Germany together with some partners. Those are just a few examples.



Estonian e-state expertise

At the moment, client companies in the USA are offered two main solutions. The first is e-commerce solutions and the second is cloud transformation. If a person visits the webpage of our large client in the US and purchases a phone or carries out another kind of transaction, they will do so in the system built by Nortal. The turnover in this field reaches billions of dollars. When you move your service into the cloud, you need to rebuild your applications. "This is where Nortal excels," says Shvaikovsky.

Although Nortal is also very strong in the field of internet security, they do not offer this service separately in the USA. Security is an important part of each project. Nortal designs its system to minimise vulnerability. This is where the Estonian e-state expertise comes in handy.

"A foundation of our e-state is the principle of data distribution. When Estonia suffered cyberattacks in 2007, they reached some sub-segments but could not take down the whole. This is the principle we always work with. I am a firm believer in security by design," explains Shvaikovsky.

Secret behind the success

It is no secret that Nortal's first years in the United States have been a real success story. A small company in terms of local market has grown rapidly, found clients and recruited talents. Shvaikovsky makes no secret of the fact that luck has also played its role in their success, but more importantly it has been solid consistency. He says that, from the Estonian point of view, the Seattle area with its 7 million people seems huge. In addition, there are the aforementioned company headquarters.

"In three years, we got the sense that in this sector everyone knows everyone. Just like in Estonia. In terms of GDP, it is equivalent to a larger European country. But the rule that 'people know people' is also relevant there. The message spreads that those men and women do quality work," Shvaikovsky explains that hard work and consistency is the basis for reaching one's goals.

Expansion plans

Nortal is also growing in Germany, which is about two years behind the States in this area. Nortal is large enough to be able to take risks and experiment. More interesting projects in Europe are planned.

Also, in the USA, they are not only staying in Seattle. Even during the Corona crisis, a large client was added to the portfolio and more staff was recruited during the most difficult times. In the next few years, they are likely to expand to the East Coast of the States. There are also talks about entering the Canadian market.

Shvaikovsky himself has recently moved back to Estonia from the USA in order to get a European project underway. An American remained in the States to lead the troops. After Finland, the USA has rapidly become the second largest market for Nortal.



Photos by Atko Januson

Cybernetica creates IT-solutions that (just) cannot fail

By Ann-Marii Nergi



Oliver Väärtnõu

The tokenless authentication system SplitKey, invented by an Estonian company, is unique in the entire world.

If we consider the birth of the software company **Cybernetica** to be 1997, when the public limited company of the same name was founded, we can say that it is an IT company with a long-standing history. However, the roots of the company reach back even further — into the 1960s, when the Institute of Cybernetics in Tallinn first began to develop this discipline of science. Back then, in the Soviet times, the focus was more on the automation of industrial systems (like factories). After Estonia restored independence, the research institutes were merged with universities, but the part of the institute dealing with applications and services fell into private hands.

Developing an e-society was already being considered in the 1990s in Estonia. There are not many systems operating currently that were created without the involvement of Cybernetica. The infrastructure of the e-state we have today is based on the topics of informational security and cryptography: the bread and butter of Cybernetica.

Today, there are around 170 people working at the company. **Oliver Väärtnõu**, Chairman of the Management Board of Cybernetica emphasises that their main goal is to create mission-critical software solutions for the clients. "This means that the solutions must be secure and must work under severe conditions."

That would be a worthy aim for any IT-company. But in the case of Cybernetica, the requirements are much higher — of the highest degree, even. For example, the company has developed the Estonian e-elections system, which has two controversial goals that it needs to achieve — it has to provide confidentiality (secrecy of the vote) and transparency (vote cast as intended) at the same time. They have also created various information systems of the Estonian Tax and Customs Board, Police and Boarder Guard, and played the most integral role in the creation and development of the famous **X-Road** data exchange layer. Today, Cybernetica has created a product version of the X-Road, which it distributes under the brand name of **Unified eXchange Platform**. The platform is in use in Japan, the USA, Ukraine, Denmark, and Tunisia.

One of the most recent and important breakthroughs for the company has been the creation of a new digital identity technology called the **SplitKey**. Once again, this is a totally unique technology in the world, which turns end-user mobile devices into secure authentication devices, equipping online service providers with a reliable and secure end user access management tool. The platform also enables end-users to digitally sign documents in accordance with European Union regulation. In Estonia and the other Baltic countries, the SplitKey technology backs the Smart-ID service and enables 3 million people to use it as a means of secure authentication with digital service providers.

Emphasis on research

"In addition to the development of services and applications, we carry out a lot of research and development related to information security, mostly in cryptography but also machine learning. As we say, R&D is in our DNA," says Väärtnõu. "After all, we have grown out of a research institute and we really live in accordance with those values."

In order to emphasise the significance of scientific research, Cybernetica gives out two different fellowships. The **Cybernetica Master's Fellowship** is intended for excellent students in the Masters in Computer Science and Masters of Software Engineering curricula at the University of Tartu. The fellowship provides students with research collaboration opportunities alongside the leading R&D-based IT company in Estonia. The second fellowship commemorates the former head of Cybernetica, **Monika Oit**, and supports information technology master's and doctorate students.

"It is important for us that, in addition to strong IT specialists, Estonia also has high quality IT science. Therefore, we encourage people to study and pursue research," explains Väärtnõu. Cybernetica also employs doctorate students who focus on research when working for Cybernetica (so-called industrial PhD's). Furthermore, every year the company also brings in around ten apprentices who often receive part-time employment, but ensures that they finish their studies.

Exchanging cyber intelligence

An important milestone, not only for Cybernetica but Estonia as a whole, was the contract signed between Estonia and the United States to build a joint platform for sharing cyber-threat intelligence between the two countries.

The system will be developed by Cybernetica and procured by the Estonian Centre for Defence Investment.

As one of the core asset of cyber defence is regular exchange of threat intelligence, the goal is to develop an automated system between the US and Estonian defence forces. "This is the first-ever joint capability developed in the cyber domain between the two countries," says Oliver Väärtnõu. He explained that if Estonia were attacked, the so-called attack signatures or information would be sent through a secure data exchange system to the Americans. Or vice a versa, if our allies discover a vulnerability in a system they use that is also used in Estonia, they can share this information securely. The contract was signed last year and currently the development work is underway. While the system will initially be used by Estonia and the United States, the parties are exploring the possibility of introducing this capability to other allies.



Cybernetica is one of the companies who has included their products in the flagship cyber defence exercise Locked Shields

Secure authentication typically requires the use of tokens (e.g. smartcards, PIN-calculators etc) in order to avoid identity theft or cloning of a digital identity. These devices are either expensive or inconvenient to use. Moreover, user registration typically requires a physical visit to whomever issues the relevant tokens. SplitKey's uniqueness comes from the fact that it is fully software-based and uses advanced cryptographic methods like threshold cryptography. It also complies with the highest security demands that European regulations have set for digital signatures and authentication appliances.

Väärtnõu says that with the spread of the Coronavirus, many countries have identified the need to become more digital. One of the first questions they usually ask is about identification of individuals in the cyberspace. If a government offers digital services to its citizens, how can it ensure that it is dealing with the right citizen for whom it has created the service? "It is quite simple — If we are unable to authenticate a person, one really cannot offer the service."

Väärtnõu is often asked how long it would take to build an e-government like in Estonia somewhere else. "I always reply that other countries would not benefit from exactly the same kind of e-government, because each country has its own systems, legislation, culture and ways of conducting business. But indeed, we can export the basic technologies from Estonia and apply them, usually with customisations elsewhere. I still want to emphasise that those technologies do not come in a box — something you just plug and play. Technology transfer is a process which requires strong local state leadership and a technology partner that is committed to transform (proven) technologies to the local needs," explains Väärtnõu.

Cybernetica is also involved in the development of the Estonian **Corona app HOIA** that was launched in August. In the case of this application, Cybernetica took the task of solving issues of privacy and security. The app notifies you if you have been in close contact with an infected person, but it does not tell you when and where you came in contact with an infected person, so it is not possible to identify the infected one. Väärtnõu admits that the app was launched slightly later than in some other countries but emphasises that it is built according to best practices. Unlike many applications launched, it does not track the activities or movement of individuals.



Photo by Atko Januson

Malwarebytes crushes cyber-threats and restores confidence

By Ronald Liive



Photo by Joanna Jõhvikas

The team of Malwarebytes in autumn, 2020

Infections have held Fernando Francisco on the edge for the past 20 years. Not the kind of infections that have been keeping the whole world anxious this year, rather the infections caused by cyberthreats.

Francisco is the Vice President of the American cybersecurity firm **Malwarebytes**. He heads the company office in Tallinn and is responsible for the corporate development and strategy of the company. The company has offices in Silicon Valley, Florida, Ireland among other places, but they established themselves in Estonia back in 2016.

Since then, Francisco has lived in Tallinn, the capital of Estonia, and has enjoyed both his personal and professional time in the medieval yet modern city. In an interview with *Life in Estonia*, Francisco talked about why the company decided to open an office in Tallinn, whether it was a good decision, what effect the pandemic has had on cyberthreats, and what the most common cyberthreats are at the moment.

Malwarebytes disrupted the thinking of how an antivirus should work

Fernando Francisco was born in Portugal and completed parts of his studies in Finland where he also laid the foundation for his professional career. Prior to joining Malwarebytes in 2011, he had worked for other cybersecurity companies, such as F-Secure and Lavasoft.

When Malwarebytes was founded, the most well-known competitors were McAfee and Symantec. Although Francisco was not at Malwarebytes when it was first founded, he knows the mission behind creating it — everyone has a fundamental right for a malware-free existence.

The competitors' products were failing to protect the user and Malwarebytes decided to develop technologies to disrupt the way people thought an antivirus should work. Compared to other antivirus software, Malwarebytes doesn't rely on samples from malware to remove them from a user's devices. Nowadays, Malwarebytes offers many different products against different types of cyber-threats. The client-base is split roughly 50-50 between corporate and consumers.

"The largest implementation that Malwarebyte's products run on consists of +500 000 computers. Without disclosing any names, I can say we have a wide range of customers from around the world in all sizes and industries. The companies come to us because we shine in our remediation technology. You can run Malwarebytes alone but you can also couple it with any other product. Even when using some other antivirus vendors, you still want to use Malwarebytes for the peace of mind," said Francisco.

Malwarebytes sees that the simplest, most effective cyberattack to deploy, is a phishing attack. Phishing is a type of social engineering attack often used to steal usernames, passwords and credit card numbers. It occurs when an attacker, masquerading as a trusted entity, dupes a victim into opening an email, instant message, or text message and the victim opens an attached file or clicks on a link that is infected with malware.

Ransomware attacks are the second-most popular attacks at the moment. These might start off like a phishing attack, the attacker tries to masquerade themselves as a trusted entity and, when they are successful, use special software to encrypt the victim's files. To decrypt the files the attacker asks for a sum of money, normally in the form of a cryptocurrency, to make it harder to identify the attacker afterwards.

There have been many ransomware attacks in recent years that got big press coverage. The latest was a ransomware attack targeting the American technology company Garmin. Just days before the attack, Malwarebytes was the first cybersecurity company to bring attention to WastedLocker, the malware used during the attack. Francisco could neither confirm nor deny that Malwarebytes and Garmin had any business relations, nor did the latter ask for any help to get rid of the malware during the attack. The attack ended with Garmin reportedly paying a multimillion dollar ransom to the attackers. Something anyone in the field of security advises against.

Office in Tallinn attracts talent from neighbouring countries

Malwarebytes has offices around the world but the main office is located in Silicon Valley. Back in 2016, they opened an office in Tallinn, Estonia because in Silicon Valley it became increasingly difficult to hire talent.

"In Silicon Valley, you are competing with Google, Facebook, Apple and everyone else. It became so expensive to hire talent. If you are not paying high wages, you don't get the best talent in Silicon Valley. The reason we expanded is because we could attract more talent to Tallinn. There is local talent here and talent from neighbouring countries such as Russia, Poland and Ukraine. Estonia makes it attractive and easy to relocate people. There were a number of factors combined for why we expanded to Tallinn," said Francisco.

To expand their business, Malwarebytes used a service called **Work in Estonia** provided by Enterprise Estonia (EAS). Work in Estonia is run by a team of people at EAS that help in the process of hiring foreign talent for Estonian companies. EAS has produced a step-by-step guide for foreign recruitment and an online portal at workinestonia.com, which provides a thorough overview for foreign specialists on matters concerning relocating to Estonia. Malwarebytes confirms that the Work in Estonia service helped them in many respects. It has been a win-win solution for Malwarebytes and Estonia in general.

"Big thanks to the Estonian government and the Work in Estonia service. Before the pandemic, we could relocate a person in just a week. Imagine when you send a job offer from the other side of the world and, in a few weeks, you are already sitting next to your colleagues at the Tallinn office. I think this is excellent. All of this combined made a huge difference for us. Tallinn, like Estonia in general, is a nice and safe place, close to other major cities. Estonia also has a good brand image in the world that our developers and engineers are keen on."

For the next six months, Malwarebytes is looking to hire around 30 new employees for their Tallinn office. The vice president does not hide the fact that the wages in the Tallinn office are not comparable to those in Silicon Valley, but that has not affected the quality of the talent hired in Tallinn.

Right now, the office in Tallinn houses around 70 employees, mostly consisting of engineers. Almost half of the office consists of Estonian nationals and the other half is comprised of many other nationalities.

Photo by Atko Januson



Fernando Francisco



Photo by Atko Januson

Just this past August, Estonia launched a new visa program specifically catering to digital nomads. Right now, Malwarebytes is looking into the program and ascertaining whether it is of any use to them when hiring new talent. The digital nomad visa gives the right to travel to Estonia, stay here as a tourist and continue to work for a foreign company or as a freelancer.

To get the visa, the interested party needs to physically apply for it at an Estonian embassy. As there were many travel restrictions around the world during the first month the visa program opened, Estonia managed to issue only five **digital nomad visas**. Before the pandemic, the projection was that around 1800 digital nomad visas would be granted yearly.

The pandemic has had an effect on cyberthreats

Recently, Malwarebytes surveyed more than 200 managers, directors and C-suite executives in IT and cybersecurity roles at companies across the US, finding out some concerning trends during the pandemic that affect cybersecurity when working from home.

Key takeaways from the research state that 24% of surveyed companies paid unexpected expenses specifically to address a cybersecurity breach or malware attack following shelter-in-place orders. 20% faced a security breach as a result of a remote worker, 18% admitted that, for their employees, cybersecurity was not a priority, while 5% admitted their employees were a security risk and oblivious to security best practices, and 28% admitted to using personal devices for work-related activities more than their work-issued devices, which could create new opportunities for cyber-attacks.

Francisco sees that during the pandemic there have been more attempts to take advantage of the most volatile people; Malwarebytes has seen that the threat landscape has been more active in the last months.

"There has been a lot of viruses, phishing attempts and other cyberthreats that use the word Covid. For example, emails with messages to click on a link to learn more about COVID-19. There have been many different kinds of threats around the pandemic."

Luckily for Malwarebytes, during the pandemic their business has been growing due to the fact that people spend more time at home on their devices and computers.

"Thanks to that, their devices are more likely to get infected and they start to Google how to clean up infections and end up with Malwarebytes. We've seen a growth in customers and revenue."

The so-called thematic threats are not something new. According to Francisco, the only new strategy of thematic threats is that they are now exploiting the pandemic, which just is the hot topic at the moment. Normally, Malwarebytes sees an increase in thematic threats during big global events like the Olympic games or the football World Cup.



Photo by Anni Suvi

How to secure cryptography against quantum computers?

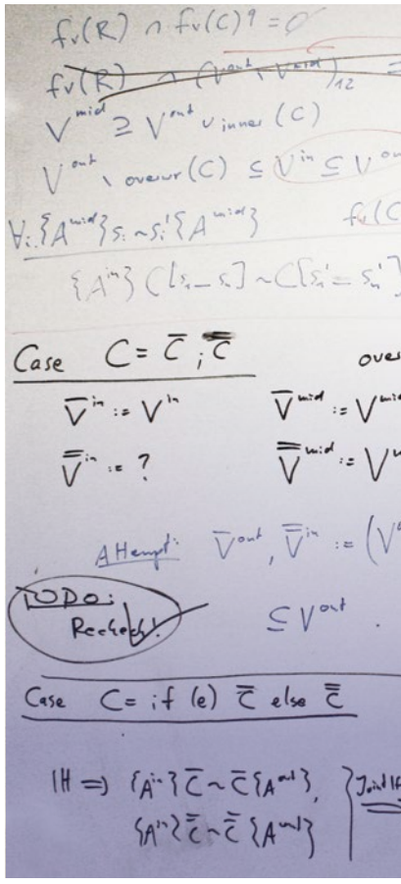
By Sven Paulus

Estonia has built an ecosystem wherein 99% of its governmental services are online. How can we ensure their security at a time when the development of quantum computers is in full swing? The solution is to improve quantum cryptography. *Life in Estonia* talked to Dominique Unruh, Professor of cryptography at the University of Tartu who is working on this task.



Dominique Unruh

Photo by Anni Suvi



There has been a lot of talk about quantum computers in recent years. How far are we from introducing and actually using them?

It is a question that is really hard to answer. There are a lot of parameters that one needs to meet. What everyone in the public hears about is the number of qubits and how big the computer is, but this is just one aspect. The other very important aspect is the amount of noise these qubits make in the computer: when you run the quantum computer and have noisy quantum bits, it means they make mistakes. There are technologies addressing how one could perform error correction to get rid of these mistakes in the computation, but for this the amount of noise needs to be below a certain threshold. So, we are not there yet, today's quantum computers cannot, for example, attack any cryptographic schemes. What we do know is that the technology of quantum computers has advanced a lot over the last years. We can assume that this progress will continue, but it is very hard to say how many years it will take.

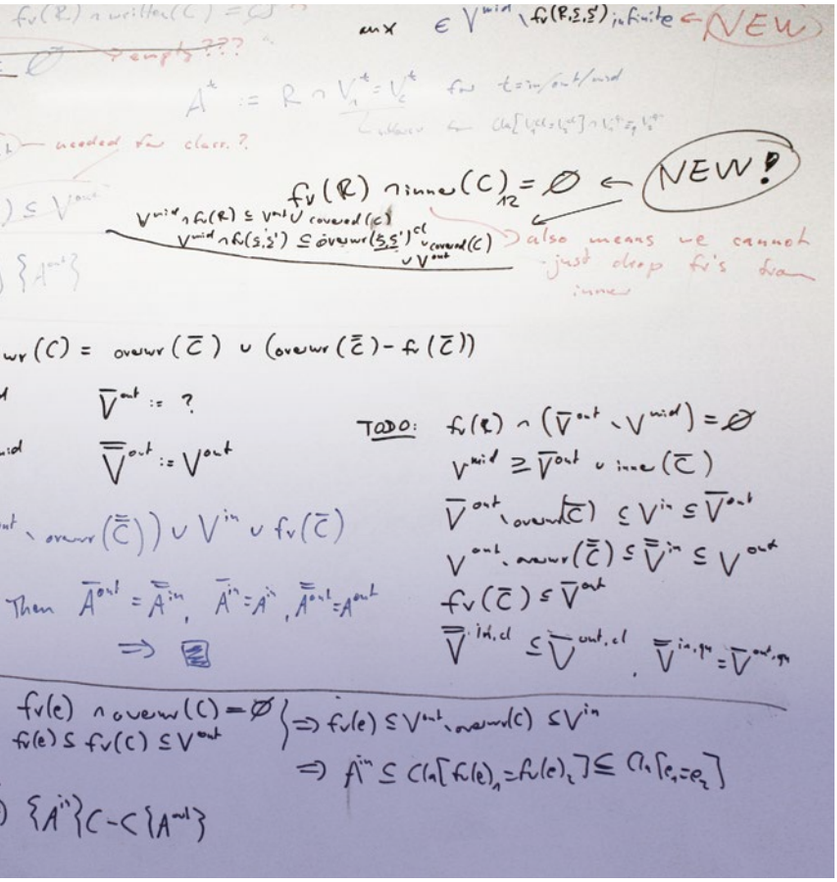
Who are the biggest developers of quantum computers?

The research on quantum computers is done both in universities and in big companies, for example at IBM and Google etc. I can't tell who is farther or doing a better job, because there are many different approaches on how to build it and only time will show which approach actually works out.

Your European Research Council (ERC) grant project "Certified Quantum Security" has 1.7 million euros in funding and lasts for five years. What is the scope and focus of it?

Our motivating question is what happens to cryptographic systems once there are quantum computers. With these, a lot of computations can be done faster. Unfortunately, some of the computations that will be done faster are computations that could be used to break many existing cryptographic systems. So, this is why there is a lot of attention towards creating cryptographic systems that are also secure against quantum computers, because we assume this will be the case at some point.

When we are designing a cryptosystem that is supposed to be secure against quantum computers then we also need to prove that it is secure, because cryptosystems tend to be quite complicated and difficult. It is usually done through mathematical security proofs, but there is still the problem that the proof is complex and there's a higher risk of human error. So humans write these proofs, they make mistakes and no one might notice these mistakes. We need to be really sure that the proof is correct and the focus of our ERC project is to use computers to verify these security proofs.



Your work is also supporting the standardisation of the next generation of cryptography, isn't it?

Yes, that is one of the aspects. There is a widespread and ongoing international effort to design new cryptographic schemes within the so-called NIST competition. This is a worldwide call for cryptosystems initiated by the **National Institute of Standards and Technology (NIST)** in the U.S. The goal is to find new standards for cryptosystems that are secure against quantum computers. It has been ongoing for some years already, there are various candidates and there is also a selection process for the final cryptosystems to be standardized. What we also want to do is verify the security of those particular candidates that are suggested for the NIST competition and, preferably, the candidates that will be selected in the end.

We have already done some research in that direction and we have recently written a paper that will appear at the Asiacrypt conference this year. The paper is about the verifying the construction of an encryption scheme very closely related to those in the NIST competition.

Basically you are trying to reinvent cryptography?

We want to be secure against quantum computers, which means that when analysing this cryptography, we need to take quantum mechanics into account, but we still want to be able to use this cryptography on normal computers. But there is also an alternative aspect: since we have quantum mechanics now anyway, can we use quantum mechanics to make our cryptographic systems more secure? That is also in the scope of the project, to analyse the security of such cryptographic schemes that use quantum mechanics. For example, in the past we have designed protocols with 'everlasting security', which means that your data is protected even if future technological developments break the cryptography used today. Or a protocol by which a file that has been transmitted to a recipient can be given back in a way that, provably, no copy can remain on the recipient's computer. Or a protocol with which a device can prove that it is in a specific location in space (e.g., to securely access location-based services). None of these things can be achieved with classical systems alone. Only quantum mechanics makes them possible. However, these are different from the developments that are happening within the NIST competition, because that competition is focused on cryptography that works on a normal computer.

Could quantum computers break through the current Estonian e-government security solutions within a short time?

The Estonian ID-cards are using signature schemes that are susceptible to quantum computers. If someone manages to build a quantum computer as we envision them, then on that quantum computer it would be a simple task to break the Estonian ID-card and, actually, most things that we use daily for encryptions and signatures.

Is Estonia in a more vulnerable situation when compared to other countries as we use so many e-solutions?

I am not sure if it would make a big difference in the impact. If someone could actually break all these encryption schemes, that would certainly have a very dramatic impact, but I think it would have such an impact in almost all countries. I'm not familiar with how deeply integrated e-solutions are in different countries, but we have to take into the consideration that not only these integrated government e-solutions would be affected, but also normal things, like any encrypted communication or online-banking. I think that Estonia is probably more integrated, but my feeling is that if there would be the possibility of widespread attacks that would be devastating in any country.

What kind of progress have you made with your project so far?

We have a prototype system for doing security proofs and we have made the first security proof of an encryption scheme that is very similar to what happens in the NIST area. I would say this is already a first step and shows that our approach works. There is still a lot to be done and this first proof included a lot of hard work. We need to improve the technology to make it easier and faster to do the proofs of the other encryption schemes. We envision that, in the end, it should be a reasonable amount of work to prove the security of normal cryptographic systems, unless they are extremely complex.



Photo by Atko Januson

Jaan Manitski turned a fishing village into an art hub

By Maris Hellrand

continues on p. 59

The 100 suitcases of the art project by **Kaido Ole** and **Marko Mäetamm** — **"100 John Smiths"** — have found their permanent home at the entry of Viinistu Art Museum. Originally created in 2004, the concrete suitcases were spread around downtown Tallinn and led to frequent alarmed calls to police. Manitski remembers: "This was a time when there were many acts of terror in Europe's cities and people were alarmed. The suitcases had to be brought here."

"As almost three quarters of the former inhabitants of Viinistu fled or were deported during and after the Second World War, this installation is interpreted by many visitors as a memorial to refugees. The small boats were overcrowded and often people had to leave their luggage behind. In the early days, an old man from a nearby village was shocked when he saw the suitcases and ran home when the workers teased him about whether he has packed yet."

Portfolio
Viinistu Art Museum



Jüri Arrak, Red Flight
Oil on canvas, 1990



Peet Aren, Red Sails
Oil on cardboard, 1923



Henn-Olavi Roode, Sea
Oil on canvas, 1962



Lepo Mikko,
Sea Landscape
Oil on Masonite, 1964



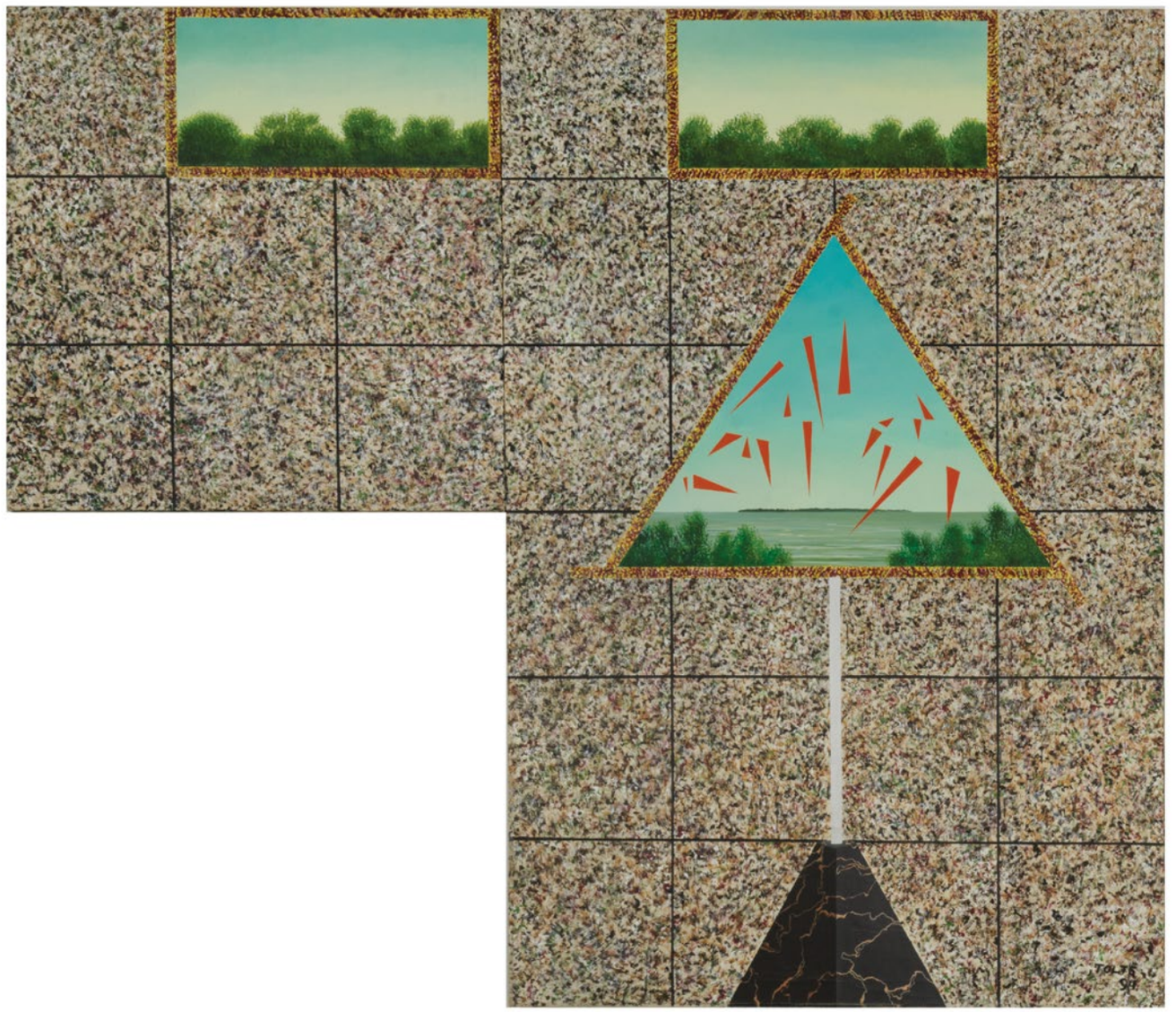
Konrad Mägi,
Vilsandi motif
Oil on canvas, 1913-1914



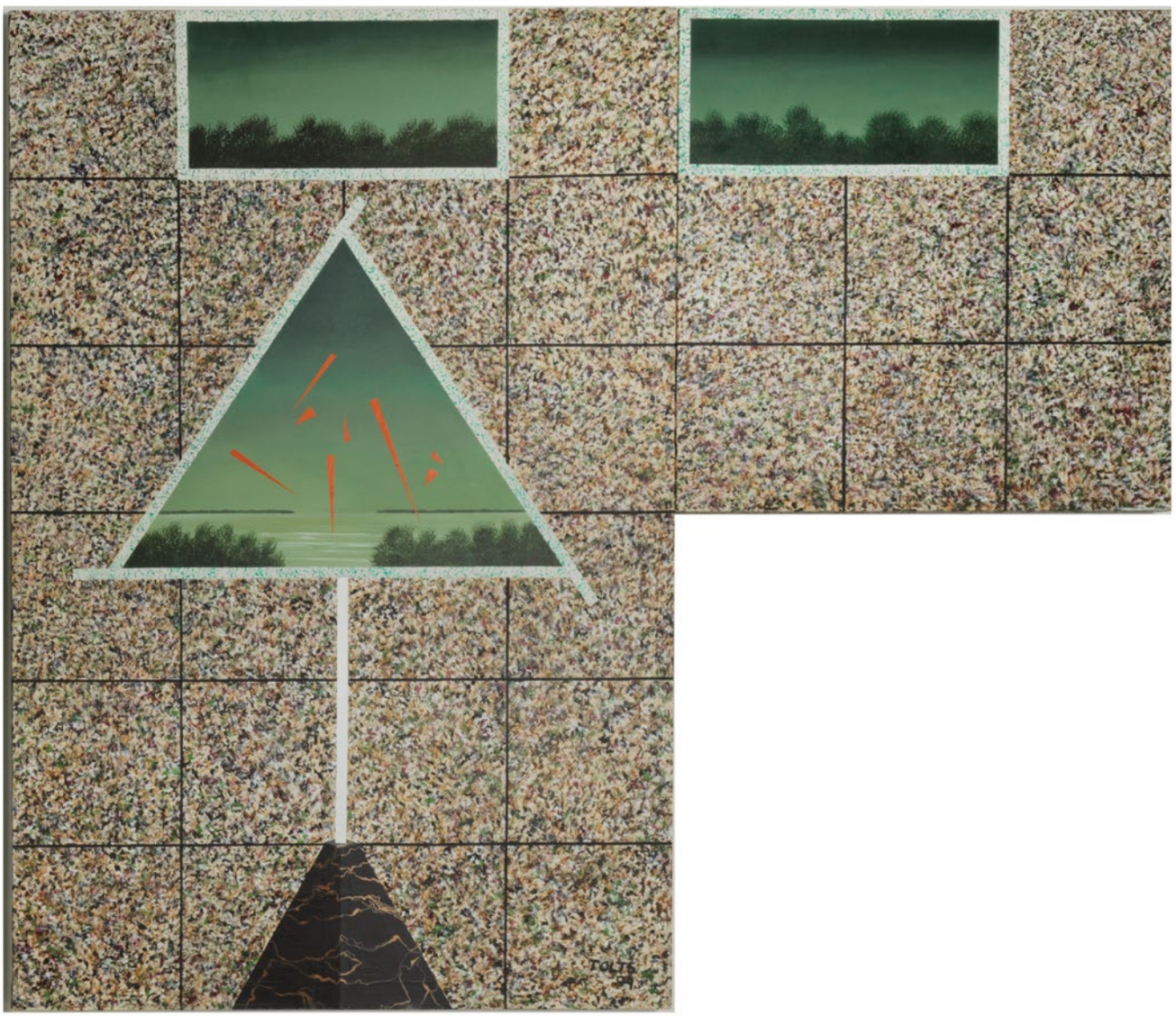
Aleksander Krims-Radava, Rocky Beach with Boat Harbour
Oil on canvas, 1930s-40s



Eerik Haamer, Outcast
Oil on Masonite, 1945



Andres Tolts, Morning
Oil on canvas, 1970s–80s



Andres Tolts, Evening
Oil on canvas, 1970s-80s



Tiit Pääsuke, Knots
Mixed media, 2010



Viinistu Art Museum has opened a new permanent exhibition with around 400 works by Estonian artists from the private collection of Jaan Manitski, who can be frequently spotted giving tours in the museum and around the premises of the former fish factory complex, which now also houses a hotel, restaurant, chapel, theatre hall and marina. Located 70 km east of Tallinn by the seaside, Viinistu has become a popular destination for art lovers.

Jaan Manitski was born in Viinistu in 1942 and fled Estonia with his parents during the Second World War in 1943, along with 80 000 other Estonians. He grew up in Sweden where he made a bright career as the investment director of the world-famous pop group ABBA. Manitski was one of the first exile Estonians to return to his country of birth when Estonia regained its independence in 1991. Manitski first served as Foreign Minister and later headed the privatisation agency. He bought the production facilities of the former Kirov fishing kolkhoz in his native village Viinistu and continued fish production there for several years.

Hundreds of workers were transported with buses from the nearby town Loksa, sprats were smoked, cured and tinned in the large halls until Russia closed its market to Estonian products in the late 1990s. Today, art lovers come to the former fish factory by the busload.

Manitski realised that a new approach was needed to keep the village alive: "We could not compete with Tallinn as a production location."

In 2002, on the 630th anniversary of the village, the former cold storage for fish opened as an art gallery. Over the years, the exhibition halls have expanded into the former pump house, giant water tanks and other former industrial objects. An old production facility was converted into a conference centre and hotel with rooms looking towards Mohni island across the bay. The former heating plant turned out to have excellent acoustics after it was cleared of boilers and pipes and has become a theatre and concert hall attracting performances throughout summers. A former storage building was turned into a charming non-confessional chapel by architect **Emil Urbel** and designer **Toivo Raidmets**; a giant window now forms an ever-changing seascape altar painting with Mohni island and a lighthouse in the background.





To make space for the collection, an annex was built according to plans by Emil Urbel and Manitski himself. The new part of Viinistu Art Museum includes large windows with a sea view that exhibit ever-changing artworks by nature itself. Manitski stops at one of the large windows where a large boulder can be seen in the water. He had heard legends about this boulder in his early childhood in Sweden: "Viinistu-people used to say that here babies are not delivered by storks like in many other places around the world but rather parents find their babies behind the 'baby-stone'." Now the 'baby-stone' of Viinistu has become part of the art collection of Manitski.

The Barrel gallery was built inside giant water tanks that were filled during the night and the water was used during daytime in the fish factory. "The rusty internal walls become alive in sunshine and could be artworks themselves — just put a frame around them," thinks Manitski out loud.

There is a bustling marina, village museum and sports hall with more ideas in the pipeline. Yet, with all the surroundings in constant development, it is obvious that the large art collection of Jaan Manitski is the heart and soul of Viinistu today.

How it all began

"At the time — late 1990s — I didn't have much knowledge of art. After fleeing to Sweden my parents were simple textile workers, there was no place for art in the factory flat. So, the first piece I bought was almost a coincidence. **Jüri Arrak** had invited me to his studio in Tallinn in 1997. He showed me one, and then another, and then a third piece of his work, but my taste in art was not very developed at the time. Finally, he took out a painting with a red bird on a blue background and told me that this

bird, which had been made to fly artificially by winding the key, symbolised the Soviet Union. It too would only fly until the wind-up mechanism lost its power. This is what sold it to me — the political message."

Manitski was smitten: "I discovered that art is a great way to educate myself — who is the artist? What's the story? Now I'm surprised myself that the collection has grown so big. Obviously, I had a lot to learn."

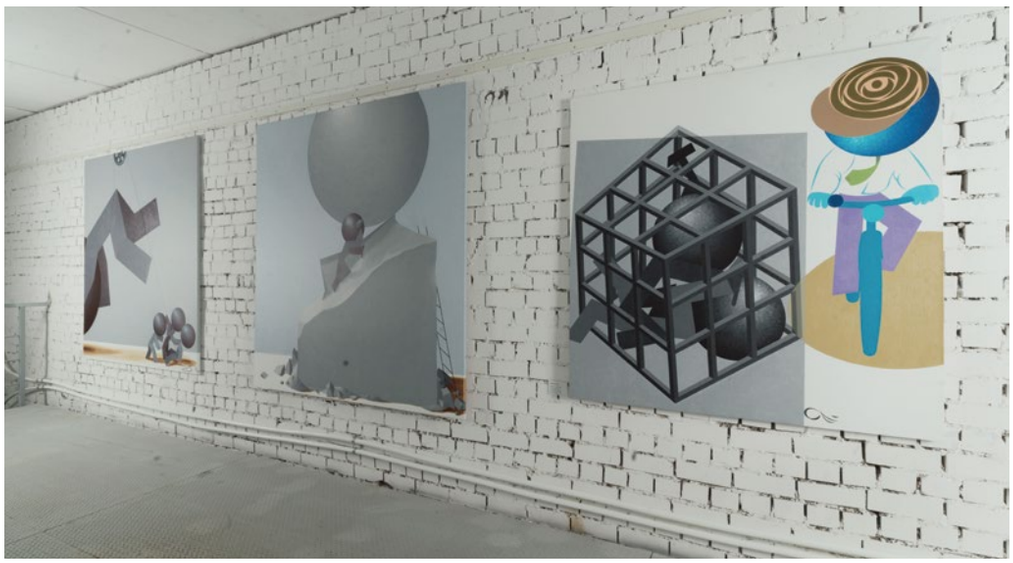
Many works in his collection have a story to tell. For example, **"Outcast"** by **Eerik Haamer** (see p. 55) who fled Estonia in 1944, rowing all the way from Vilsandi island to Sweden. Manitski later met Haamer's son in Sweden, who told him that his hands had no skin left and it took a whole year of recovery before he could hold a paintbrush again. "Outcast", painted in 1945, at first seems associated with the escape, but a closer look tells a grim story from Ruhnu island where the artist used to spend time before fleeing Estonia.

The tradition-bound community sends a single mother and her baby off to sea on a boat with no oars.

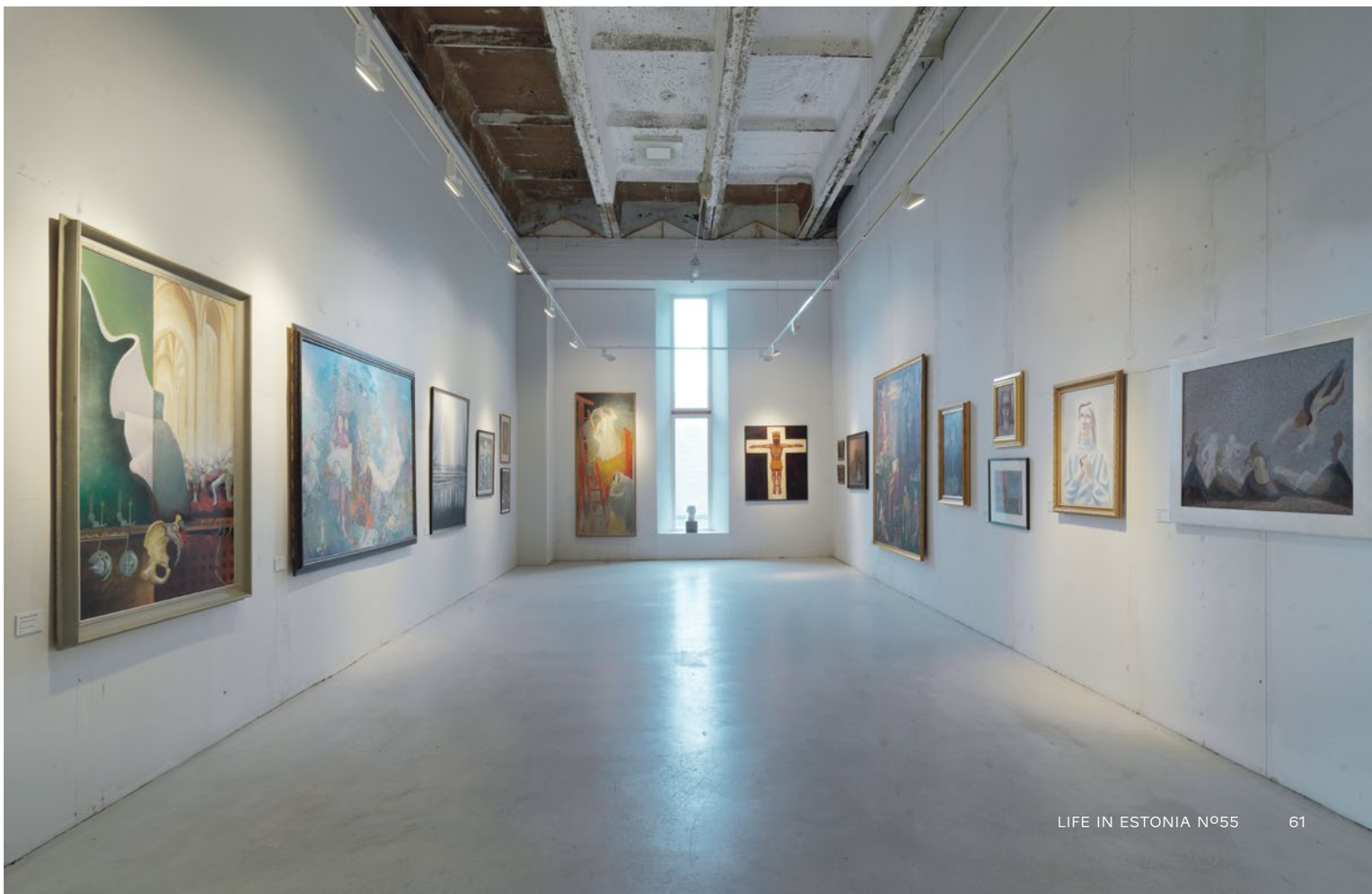
Or, the landscapes **"Morning"** and **"Evening"** (see pp. 56-57) by **Andres Tolts**, that once decorated the main lobby of the Olümpia Hotel in Tallinn. Jaan Manitski accidentally saved them from the rubbish container during the renovation of the hotel as these had just been broken to pieces and a corner stood out from the dump. Luckily the works were not broken beyond repair.

The collection consists of more than 1000 works by Estonian artists from the 19th century up to contemporary art, from Estonia as well as Estonian artists in exile during the Cold War era. Manitski admits that the collection grew fast and at times erratically. It was only organised in a digital catalogue by art students a few years ago. "One day, when I retire again, I will make a proper catalogue with facts and stories to each piece," says Manitski.

Works by Kaido Ole



View on the mythology section







Tiit Pääsuke, Boy and a Fish
Mixed media, 2002

Tiit Pääsuke, Altar
Mixed media, 1989 (restored 2016)

Curator's touch on the new expo

This new exposition is the first time the collection has been viewed and organised through a curatorial lens. As part of the Tallinn Biennial, curators **Mary-Ann Talvistu** and **Kädi Talvoja** created a concept that brings together top pieces from auction houses, contemporary street-art favourites and works by lesser-known artists. According to project manager **Andra Orn**, a few focal points became visible while working with Manitski's collection.

The new exposition has been organised in several distinct sections. **The Baltic German section** includes artists from the Düsseldorf Academy together with the first Estonian professional artists like **Johann Köler**, **August Weizenberg** and **Amandus Adamson**. The hall of **genre paintings** brings together relaxed still lifes, festive leisure moments and painful loss of the homeland by artists such as **Johannes Greenberg**, **Eerik Haamer**, **Richard Sagrits** and **Olga Terri**. Seascapes are represented by modernists like **Konrad Mägi** as well as contemporary artists like **Tiit Pääsuke**, who has depicted the symbol of Viinistu — the lighthouse on Mohni island.

A separate room is dedicated to rare sketches of **Eduard Wiiralt** that Manitski dug up himself in the drawers and back rooms of Paris antique shops. Many well-known pictures by the artist can be first recognized on the back of an envelope or a napkin.

The **mythology section** brings together motifs of the Estonian epic hero **Kalevipoeg** by **Evald Okas** and the religious symbols of Jüri Arrak, among others. **Landscape paintings**, which are popular among Estonian artists, form a season of their own in Viinistu. Among other works, you can find the scenes of spring-summer by **Elmar Kits** and **Linda Kits-Mägi**. The **tribune section** includes social and political messages from **Leonhard Lapin**, **Lola Liivat**, **Kaido Ole** and **Marko Mäetamm**.

The section of **portrait paintings** brings together autoportraits and dialogues with models. The flowers by **Malle Leis** presented in the middle can be seen as an allegorical reference to the artist herself. Indirect connections are also created in the section of **fantasy**

landscapes where the graphic art of **Tõnis Vint**, the paintings of **Jaan Toomik** and the photography of **Peeter Laurits** combine into a consistent whole.

The last section — **nudes** — presents pieces by **Olev Subbi**, the latest record-breaker at Estonian auction houses.

The newest masterpiece of the permanent exhibition was born moments before the opening when street artist **Edward von Lõngus** arrived to create a stencil painting **"PaperPlane"** on the white brick wall of the museum. The staff of the museum said that the artist was accompanied by a group of friends who all participated in completing the painting, hence the secret persona of Edward von Lõngus was not revealed in Viinistu.

The owner of the collection likes the new concept: "Earlier, it was an exhibition, now it's an art museum. It is thought through and designed professionally by Tiit Pääsuke, whom I trust.

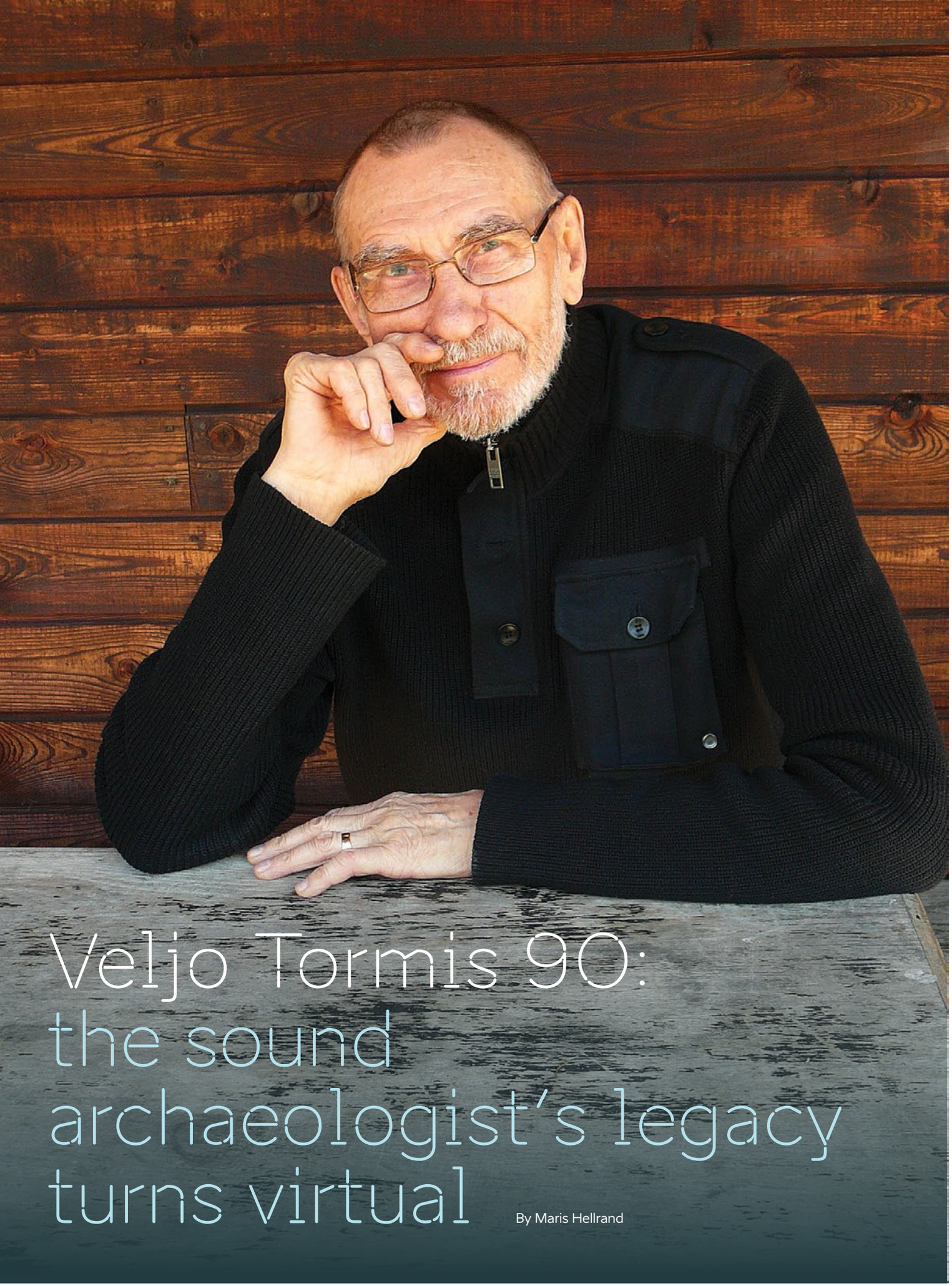
On the other hand, the old expo had a certain charm as well. And there are still some paintings that I think should be up there that were not selected by the curators. I might sneak them in once the curators are gone. Surprises still to come!"

Viinistu is by no means ready. Manitski says, he doesn't like to make plans ... but: "I hope to get on with the reconstruction of the 800 square metre, former factory/restaurant. It looks ugly now, but it is actually interesting architecture. I want to open the seaside wall with a huge window and create art studios in there. We have a few guest apartments, so artists could stay there and use the studio. Art residencies would be great here, it's a very inspiring environment to work."

Another idea being contemplated in cooperation with NOBA (Nordic & Baltic Art Centre) are house museums of Estonian artists in Viinistu — a studio setting of an artist will be recreated and the works exhibited in an intimate way.

Edward von Lõngus, PaperPlane, 2020





Photos by Tõnu Tormis

Veljo Tormis 90: the sound archaeologist's legacy turns virtual

By Maris Hellrand



Veljo Tormis had a large collection of shaman drums from all over the world

As the first rays of August sunrise wash over the glade in Kõrveaia, the singers of Vox Populi choir chant ancient melodies of the forgotten peoples to awaken the birds. It's the 90th anniversary of Veljo Tormis (1930–2017), the composer who brought the archaic, runic song of the Finno-Ugric people into the limelight and saved the ancient art from oblivion.

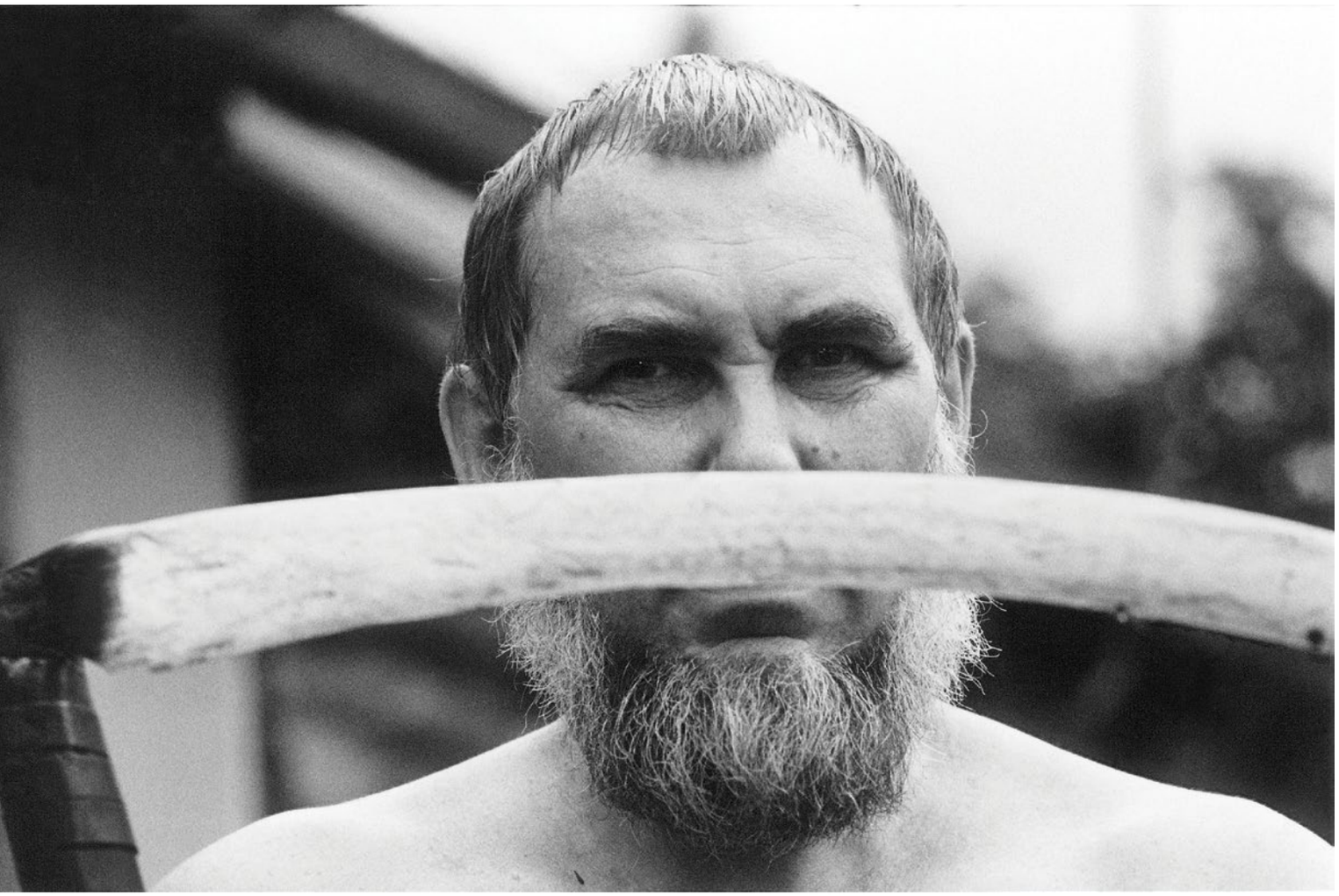
Kõrveaia farm, some fifty kilometres to the east of Tallinn, is the birthplace of the composer **Veljo Tormis** and one among many venues in Estonia that were filled with his music throughout August. Perhaps this was the most authentic place to grasp the depth of the music. The natural setting with the rising sun, morning fog, and birdsong teleported the singers and the audience into the timeless landscapes that surrounded the ancient tribes and communities that gave birth to the melodies a thousand years ago.

Tormis has been called a sound archaeologist — he excavated the ancient melodies and wrapped them in an artistic form with his own compositions, thus making the melodies accessible and giving contemporary singers and audiences a chance to dive into the roots of this music and identity. It's impossible to overestimate the role of Tormis in preserving folk music. In fact, he has considered it the most important part of Estonian culture: "I feel the duty to transmit the folk music itself, its core, spirit, meaning and form. I think that runic song is the most notable and original phenomenon of all time in Estonian culture. I consider it so important for our culture that I want to do everything to make it widely accessible and known."

Folk music with a strong message

No doubt, Tormis succeeded in his mission. It all began with his visit to the small island of Kihnu where he witnessed a traditional Kihnu wedding. This experience led to the writing of the cycle for mixed choir **"Kihnu Wedding Songs"** in 1959. A pivotal piece in his handling of runic song became the series **"Estonian Calendar Songs"** (1966-1967), which consisted of five cycles: **"Mardilaulud"** (Mardimas Songs), **"Kadrilaulud"** (St. Catherine's Day Songs), **"Vastlalaulud"** (Shrovetide Songs), **"Kiigelalulud"** (Swing Songs) and **"Jaanilaulud"** (St. John's Days Songs). This choral piece helped to develop Tormis' unique style. He himself has said "I do not use the folk tune; the folk tune uses me". This means that folk music was not a means of expression for him, on the contrary — he felt the duty to transmit folk music, its spirit, ideas and form.

Between 1970 and 1989, Tormis composed the six-part series **"Forgotten Peoples"** for mixed choir based on the perpetual melodies of six Finno-Ugric peoples (Livonians, Votic, Izhorians, Ingrians, Vepsians and Karelians) who, at the time, were all but forgotten by the wider world. By the time he finished the series, all of the folk singers whose songs



Photos by Tõnu Tormis

formed the core of the compositions, were dead. Many of the ancient Finno-Ugric languages have very few speakers left. By preserving the languages and stories within his compositions, Tormis has made them immortal. The double CD of "Forgotten Peoples" was released under the ECM label in 1992 by the Estonian Philharmonic Chamber Choir (EPCC) conducted by **Tõnu Kaljuste**, who has spent his lifetime ensuring that the music of Tormis is heard in the world.

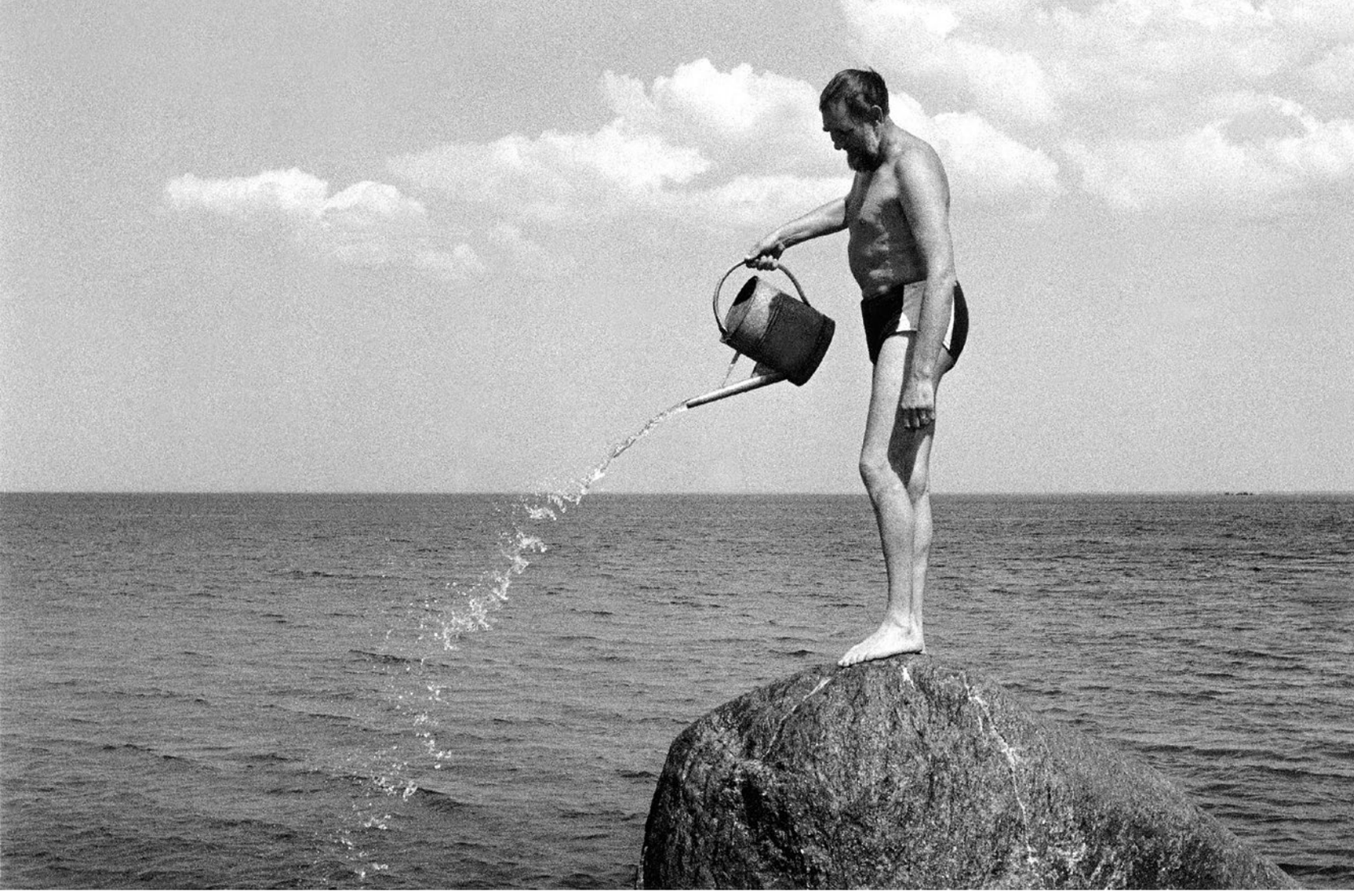
Tõnu Kaljuste, who has performed and also recorded most of Tormis' works for mixed choir with the EPCC, claims (with a touch of humour) that Tormis composed one of his best-known choral pieces **"Curse Upon Iron"** in 1972 while he was often forced to hear heavy metal music that his son listened to at home.

The piece is based on the Finnish epic Kalevala and it has been performed by countless choirs worldwide as well as the legendary Estonian ethno-heavy band "Metsatöll". Tormis has said that he carried the piece in him for seven years and he was physically shaking when he finally wrote it down. An emotion that performers and listeners alike have shared for decades. Yet, at that time the official Soviet music bureaucracy didn't value the piece much, offering a fee of 30 roubles for the composer's effort (worth a pair of shoes at the time). In 2011, Tormis said: "'Curse Upon Iron' and '**God, Protect Us from War'** draw attention to the actions of big powers that harm people. This was purposeful activity that I started in the 1970s. I wanted to resist. Today it's hard to grasp what the meaning of a few lines in a song can be."

The founder of Viljandi Folk festival **Ando Kiviberg**'s first encounter with the music of Tormis was as a singer in a boys' choir: "Tormis reached to the deepest roots of Estonia. He used choir music to promote runic song, something he considered to be a musical mother tongue." Kiviberg is convinced that, without Tormis, runic song would be a peripheral niche phenomenon: "He used the choir and song festival movement as a tool to create a joint runic song experience — the best and most effective way available in Estonia. Therefore, so many people in the music world feel comfortable with runic songs and carry the tradition."

From ancient to virtual

Tormis saw folk song as his life's work and he also began teaching it. He performed as the lead singer at many events and managed to make people feel the almost shamanistic magic of runic tunes. Tormis was well-acquainted with the presentational mannerisms of runic tunes and he also demanded this typical singing style from the performers of his compositions.



He has said: "Having developed throughout centuries, runic song is the most ancient, unique and complete creation of our people; the expression of our creative genius. The original rhymes, parallelisms and poetic images of our ancient runic song hide a magnitude of melodious chimes and shine, the beauty of word and thought, and a suggestive power which is born from the monotonous repetition of a runic tune." Tormis considered the words which have been used to describe one's mother tongue to also apply to the music: "The song of my people is the best, the most beautiful and the most valuable to me."

His body of work, now also widely accessible via the **virtual centre** **veljotormis.com**, includes hundreds of compositions for choirs but also instrumental, film and stage music.

Why a virtual centre?

According to the composer's son **Tõnu Tormis**, who is a professional choir singer and has been organising the conservation of his father's legacy, Veljo Tormis was very interested in a website that would bring together information about his creations and simplify finding sheet music, recordings and discography for many interested people. "The first attempts were the webpage created by **Alan Teder** in Toronto and my own 'Veljo Tormis databank'. But it soon became clear that the daily search for Veljo's concerts and coverage and the regular updating of this information is too much work to be done as a hobby. At about the same time over a decade ago, the music journalist **Immo Mihkelson** approached me with the idea of creating a modern website based on a database."

Iti Teder, project manager of the virtual centre, says that Veljo did not want a statue or a monument. A 'real' centre was never a topic with him. Also the folk music which Tormis as a composer used, has been preserved throughout centuries in the form of an idea. The most important building related to Veljo Tormis is his birthplace in Kõrveaia, which is located in the Aru village of Kuusalu county. Some interested people can visit there on the basis of former agreement with the Veljo Tormis Cultural Association and the present hosts.

For further interest see
veljotormis.com



Veljo Tormis and Arvo Pärt with Tallinn Chamber Orchestra and the Estonian Philharmonic Chamber Choir in 1999



Tõnu Kaljuste has spent his lifetime ensuring that the music of Tormis is heard in the world

The virtual centre was opened on the 90th anniversary of Veljo Tormis, on August 7th, 2020. The catalogues of discography and performances make it very clear that Tormis is a household name for choirs around the world, not just in Estonia. So, the virtual nature of the centre is a practical way to make the material accessible to millions of choir singers around the world. "Tormis is quite possibly bigger in the world than he is in Estonia. Therefore, the centre aims to collect and consolidate all available information about publications and performances. There are more than 700 records worldwide and counting. The recordings stretch to all continents and go beyond choir and classics," says Iti Teder.

With the help of this centre, choirs in the whole world can find music by Tormis easily. It also offers teaching materials to music schools and other institutions. The new centre hopes to involve and engage Tormis' fans from all over the world with a storytelling campaign where people can share their memories and experiences of Tormis' music. "The virtual centre should become a home for an international community interested in Tormis' music and promote even more performances. Now that the virtual centre is open, it will keep growing and will never be completed, as there will be new performances and recordings of music by Veljo Tormis," says Teder.

Photo by Atko Januson



The Estonian IT-sector is attracting an increasing number of experienced Brazilian female specialists

By Tanel Saarmann

Estonian companies are open to recruiting Brazilian talent who quickly go on to become valued employees and promoters of the Estonian experience.

Many of those professionals end up joining tech companies that service international markets and offer opportunities for career growth. And it has been a match made in heaven — the companies claim that their hires have turned out to be very hard-working and dedicated, as well as good communicators and team workers.

Albeit the tech field is stereotypically associated with mainly male talent, several Brazilian female specialists that have moved to Estonia prove that there is more than enough space for anyone that is prepared and dedicated.

The following four stories of brave Brazilian women, who changed their (and their whole families') lives in order to continue their careers in Estonia, illustrate just that.



Choose the company, not the country

Gabriela Strautmann studied tourism in Brazil and has worked in the field of customer support for thirteen years now. In 2017, after having returned to Brazil from a four-year-stay in Ireland, Gabriela began to look for new employment opportunities abroad.

She quickly stumbled upon the company **TransferWise** and her mind was made up — Gabriela, her husband, and 11-month-old baby were going to move to Estonia. "As a matter of fact, I did not choose Estonia but the company I wanted to work for. I targeted companies which I thought might offer more opportunities to grow," she explains.
At TransferWise, Gabriela took on the job of Portuguese-language Customer Support Agent. It did not take long for her to be promoted to specialist, first, and then even further to Team Lead sometime after that.

Gabriela's husband Pedro, who is a construction engineer, found a job shortly after moving to Estonia as well. "Pedro said he would send out his resume to a few places. The following week he already received three invitations for job interviews and was basically immediately employed as a construction engineer by an Estonian company," Strautmann is happy to report.

What is it like for a woman to work in Estonia? Gabriela says that it is quite similar to Scandinavia. "There is gender equality," she says. "You see men pushing prams on the streets, doing household work and fathers who stay at home with their children so that their wives could return to their careers."



Former teacher has it all in Estonia

Quite like Gabriela, **Diana Cavalcanti,** who has a PhD in software engineering, found herself in Estonia by coincidence. She was a teacher in the field of technology, dreaming of international experience as a software developer. Then, in 2018, she saw a video on YouTube about Brazilians who had travelled to Estonia.

"I knew nothing about Estonia or its employment market at the time, but got interested and started to research it," explains Diana. Soon after, she started applying for jobs with Estonian companies, when finally, in November 2019, she accepted an offer from the company **GameSys**.

"At first, it was all new and unfamiliar. Estonia is not a place people usually go to. But I was not only looking for a job, I wanted new experience and to explore a new culture," she explains.

Today Cavalcanti works as a software engineer and, overall, her experience has been positive: "I have everything here — a safe environment and a job I like and feel challenged by."

Diana admits that there are mostly men working in her company today, but more 'talented girls' are set to join the company as testers and developers soon. "Women take on challenges and follow through. They do not want to fail, and they always try their best," she claims.

What Diana likes most about living in Tallinn, is the fact that the services here are of high quality but it is still a small and cosy town by world standards. In her spare time, she likes to enjoy Estonian nature and culture. Diana was surprised by the high level of public e-services, the fresh air and clean nature. In addition, life in Estonia is affordable, the architecture diverse, and the package terminals of the post service 'very cool'.

What Diana misses the most, however, is getting more integrated in Estonian society. Currently, she worries about not easily meeting people and making friends.

Nevertheless, Diana has a clear and simple message for Brazilians — come and work in Estonia, you will not regret it. Fortunately, more and more of her fellow citizens are discovering it.



More time for personal life

Milena Nogueira Apolinário Armando, a supply chain professional from the state of São Paulo, took similar advice to Diana's from a friend that visited her and her husband Fabiano in 2017. Her friend happened to live in Tallinn at the time. This visit changed Milena and Fabiano's lives.

"We wanted international experience, but we were not brave enough to leave our jobs," admits Milena who already had 15 years of work experience at the time. Her friend's detailed account of Estonia, however, made the couple very curious. "We thought, now is as good as ever!" she recalls.

Milena then applied for jobs in Estonia via Glassdoor and was hired as customer support by TransferWise. She arrived in Estonia two months later and became team leader within seven months. Milena's husband Fabiano also quickly found work in the IT field in Estonia. Today, Milena has returned to her original area of expertise — supply chain — working for **Jeld-Wen**, a multinational industry in the building products sector.

"Here in Estonia, I can plan my own work and have more time for my personal life," Milena says. She is currently the company's Northern-European demand planner. Her main task is to lead the demand planning process. Together with colleagues, she analyses data from the past, market trends, competition activity, the status of economies, etc. to determine the company's sales forecast.

"I really like living in Tallinn. It is a beautiful town. We feel safe here. There is a great selection of bars, restaurants, pubs, cafes and, in addition, you are surrounded by nature. It is a privilege to live in the city and at the same time so close to the natural environment," she says. Milena also likes the changing of the four seasons that she can experience in their full beauty in Estonia.

The only thing that bothers Milena, since she really misses her family, is the fact that there are no direct flights from Tallinn to Brazil. She has thought about moving closer to her homeland but changed her mind every time.

Milena says she recommends Estonia to Brazilians, but that the latter need to have an open mind since it is a fact that we are very different. "That being said, it is in Estonia where I feel more comfortable to work and where my intellectual freedom is respected."

"I find it great that we are different, even opposites," she says. "Estonians usually have a full plan ready to go, whereas Brazilians are always ready for surprises with a plan B up their sleeve. So, when we work together, we can move mountains," she adds. In addition, laughter and humour are guaranteed.



Raquel Pontes

Pipedrive employs 24 Brazilians

For the Estonian company **Pipedrive**, Brazil has been among the three largest markets over the years. It is therefore no wonder that they also employ many Brazilians — 24 in total — and 10 of them work in the Tallinn office. Among them, there are developers, customer support staff and Brazilian Portuguese language content producers.

Mariliis Beger, Communication Manager of the company says that the Brazilians in Estonia have a very unified and supportive community. As their hearts beat in the rhythm of football and they cannot live without good quality meat, they organise various joint football evenings and grill parties.

"The biggest cultural difference between Estonians and Brazilians is perhaps the fact that, at meetings, Estonians greet each other and proceed to the topics on the table, whereas Brazilians first talk about their families, weather and weekend activities. Only then does business become relevant. But, on the whole, they are very hardworking people and always put their hearts into everything they do," says Beger.

Raquel Pontes, who has worked nearly two and a half years at Pipedrive as Content Manager of Portuguese language markets, found the job by chance in a Facebook group for translators.

"At first, Estonians and Brazilians are totally different people and it is complicated to see any similarities. Whereas it is common in Brazil to be friends after five minutes, sharing details of private lives; this does not easily happen with Estonians and this in itself is not bad at all. Estonians need time 'to melt' and, when you get to know people better, you'll realise that they are in fact very warm and friendly people," she says.





Bringing more women into IT

In **Amanda Souza's** case it was her husband **Victor Nogueira**, a software engineer and game developer, who found work in Estonia first. However, Amanda, who had worked for years as a software developer in Brazil, received an offer to become DevOps engineer at **Veriff** a mere two weeks later. To date, Amanda has moved on to the **Microsoft Development Centre Estonia** where she works as Site Reliability Engineer.

"I come from a very poor family where my mom had to work very hard in order to earn a tiny salary. I took the responsibility of taking care of my brothers," Amanda says. Nevertheless, education was always a priority. "My mother always said that studying hard would give me the best chance to achieve success one day," she recalls.

And so it has. Now, in addition to her full-time job, Amanda actively participates in projects linked to bringing more women like herself into the IT world.

"At one point, during my studies, I changed my IT-course to nursing, because I believed the IT industry was only for men," uncovers Amanda the reasons behind her mission. "But after a semester in nursing school, I decided to come back to IT and change this mindset," she adds.

"Some mindsets need change to break down the unconscious gender bias and promote further equality of women in IT," she says.

"I also joined Microsoft through a project which helps women to enter the field of IT," adds Amanda. More women feeling empowered and entering the tech sector is definitely a welcome and globally growing trend in her opinion.

Increased interest on both sides

According to Work in Estonia's Client Relations Manager **Grete Soares de Camargo**, a growing number of Estonian companies welcome skilled specialists, both women and men, to their teams. Brazilian IT specialists are a great example of those that have done really well here. "The cultural fit is quite good, Brazilians are hardworking but also great communicators," explains Grete. "According to Estonian employers, the recruited specialists have proved to be skilled, flexible and ambitious professionals, while also approachable and easy to work with as people."

"What is more, we have noticed that there is growing interest among Brazilian talent to find out more about Estonia, what it is like to live and work here. Good news travels fast, the positive experiences that professionals like Gabriela, Milena, Amanda, Diana and many others have had here definitely serve as examples and further inspiration to other capable talent from around the world looking for a new professional challenge, good quality of life and overall opportunities for themselves and their families."

The Work in Estonia initiative is the connector that helps the talent and Estonian companies find each other more easily.



Photo by Margus Pahv

Estonia pulls off miracles in hosting the restart of the WRC series. Ott Tänak makes history







Ott Tänak and his co-pilot Martin Järveoja on the podium as champions of the historical rally in their native Estonia

Estonia has made the impossible happen. In two and a half months, the FIA World Rally Championship round was organised in Southern Estonia.

The Coronavirus era gave Estonian racing fans a dream scenario to take solace in. Out of the blue, the organisers of Rally Estonia received a proposal to become part of the WRC series. This was not just another rally competition. The race restarted the WRC series on Southern Estonian roads after a five-and-a-half-month pause.

A true fairy-tale: **Ott Tänak** and his co-pilot **Martin Järveoja** became champions of the historical rally in their native Estonia. In addition, it was the first win for the current world champions whilst driving for Hyundai. A beautiful moment during problematic times.

Urmo Aava, the chief organiser of Rally Estonia, and his team accepted a huge challenge in early summer. They had just two and a half months to organise a top-level competition. Regardless, they did not give up on their main motto — to organise the best rally in the world. Comparing various rallies is a subjective undertaking, but there is no doubt that the Estonians pulled off a supreme job.

Passions already in winter

"The feedback I have seen is that the level they were able to achieve is really, really incredible — it's a top-level event for WRC and they only had a few weeks to do the job," said FIA rally director **Yven Matton** in praise of the Estonians. "It's not only that they organised a rally at WRC level, but it's also that they have to put in place all this COVID process which had a lot of complications. It's also important the help they received from the government to re-start the WRC at such a high level."

The passions around Rally Estonia were running high already last winter. In February, it transpired that the organisers of the rally and the Estonian Autosport Union were at loggerheads over finances. The arguments became heated over the union's wish to raise the competition registration cost to 100 000 euros. Yet, at that point, there was no hope that the 10th Rally Estonia could become a WRC rally. It was just planned to be a strong rally which, like in previous years, the teams would use as their preparation for the Finnish rally.

No solution to the argument was found and both sides stubbornly kept to their demands. In the beginning of March, the rally organisers announced the cancellation of the event.









Photos by Margus Pahv

Due to the Coronavirus pandemic, one rally after another in the WRC season calendar got cancelled. FIA was faced with the necessity to look for alternative options. Therefore, a proposal was made to Rally Estonia — which had carried the status of a WRC series promotional rally until then — to become a WRC rally.

Of course, the Estonians grabbed the opportunity. Governmental support gave an important impetus. The state allocated 2.5 million euros to help organise the high-level event. In addition to securing additional private sponsorships, the organisational team of Rally Estonia put in an incredible amount of work. The collaboration between the Estonian state and the organisers led to the start of the first WRC rally on Estonian soil on September 4th, 2020.

Strict regulations due to Coronavirus

The conditions for the organisation of such a large-scale event were far from ideal. In the era of COVID-19, it was not possible to let an unlimited amount of spectators watch the special stages. Under normal conditions, the spectator numbers would have reached about 100 000. Now the organisers had to be satisfied with 16 000. The spectators were also divided into groups of one thousand and everyone was allocated their own specific viewing spots.

The different groups did not have any contact during the rally. The spectators also had no access to the rally park, which is a real attraction for true rally fans. In order to prevent the possible spread of the virus, people had to wear masks next to the track. The same requirement applied to the team members in the rally park. Truth be told, the risk of the rally taking place without spectators was there until the very end.

Implementing the regulations of the Corona era was just a warm-up. The main precautions took place during the two days — the rally was slightly shorter than normally — at special stages. The final result of the rally, which offered many dramatic highlights, was worth all the effort. It was the best reward. What else can be said about the victory of Tänak and Järveoja...

Yes, the Estonians were the favourites. After all, they raced on home soil and it is difficult to find a match for Tänak on very fast rallies. But the entire rally world knew that such roads were more suited to Toyota cars. Therefore, a fight was expected between the three Toyota drivers and Tänak. The reality was very different.



Once again, Tänak proved that he is the best car tuner among top rally drivers. In 2017, he managed to speed up the Ford Fiestas of the **M-Sport Team**. After changing teams, it took him half a season to turn the Toyota Yaris into the fastest car in the rally world. In the second season, he reached the World Championship title in that car. For years, Hyundai has been in trouble at fast rallies. Tänak joined their team this year and at Rally Estonia he was the fastest in their team car.

Tänak tolerated heavy pressure

In rally sports, the result is dependent on many details. In order to be fast, you need the skill to tune your car, but also to tolerate pressure. After the first three rallies of the season at the beginning of the year, Tänak had not reached full potential. His big competitor, the six time World Champion **Sébastien Ogier** was starting to slip away in the points table. Hence the driver from Saaremaa was worn down by many duties.

"I was under heavy pressure and stress," Tänak admitted. "The first WRC rally in Estonia... I had the duty to win. I also had to win for Hyundai and complete the race. Sounds complicated. You cannot take unnecessary risks or make mistakes, but you need to be fast. And finally, we had the chance to win back points from Sébastien Ogier. We pulled it all off." Tänak's action on home soil was smart. He did not attempt to win all stages at any cost. On the contrary, Ogier and the Finnish wonderchild **Kalle Rovanperä** won five special stages, Tänak only three. But it was those stages that put him way ahead of the competitors.

In terms of the whole WRC season, Rally Estonia was just a puzzle piece in the larger picture. For Estonians, however, it has made history. Of course, it is hoped that the WRC series will come back to Estonia. Estonians have received a lot of praise, but there is no final answer to that question. "For sure, we can say that in a normal situation, what they have achieved could give them the right to be on the list of potential events that have the right to join the championship," said Matton. "We know we have less slots than events, but at least it would give them the right to be on the list for events that potentially join the calendar."

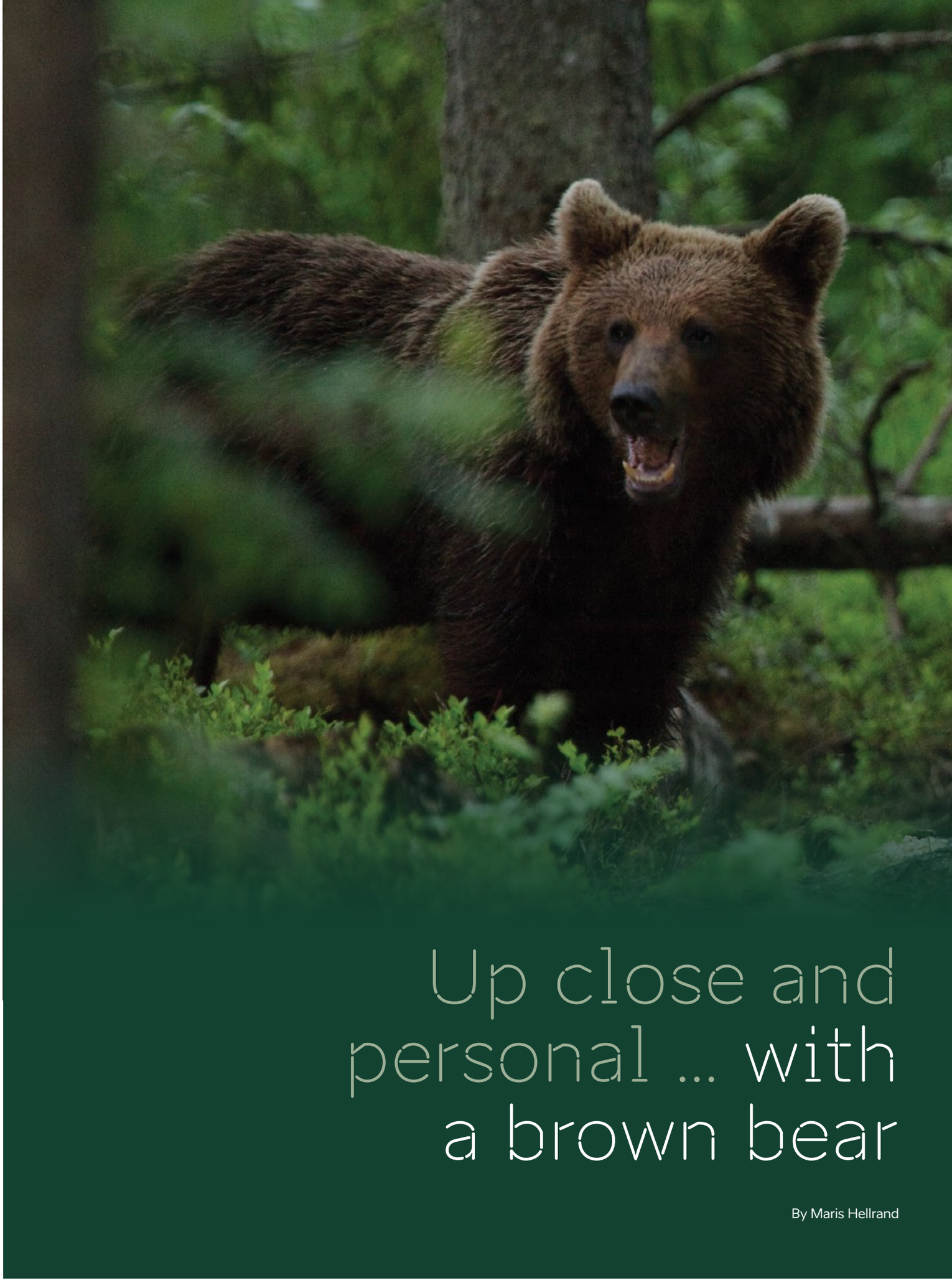


Photo by Jarek Jõepera

Up close and personal ... with a brown bear

By Maris Hellrand







The young male bear appeared on the clearing just before 8 pm, sniffing around the forest's edge at first, then working his way closer to the hut. By this time, we had spent two hours in the bear-watching hide-out of **NaTourEst** in Lääne-Virumaa, observing a few raccoon-dogs, red squirrels and birds.

The bear — as if aware of his role as the leading act of the night, seemed relaxed and happy; he just kept wandering around, wading in the stream, scratching his back against the tree-stems, disappearing in the woods and returning to the clearing on either side of the hut throughout the evening. He didn't take notice of any human observers while the raccoon-dogs respectfully kept their distance, only appearing when the bear was busy elsewhere. The bright Estonian midsummer night allowed great views of the animals until well after midnight.

Bert Rähni's company NaTourEst has been offering adventure and nature holidays in Estonia since 2008 and now owns 85 ha of wilderness, approximately 150 km east of Tallinn. It's located at the western end of the Alutaguse region where about half of Estonia's 800 brown bears live. Once arriving at the meeting point, there is a bear nature trail to learn about the habits of brown bears, recognize signs of them in the surroundings, and also dismiss myths — like bears sleeping in caves! In Estonia, they actually mostly make a 'nest' under a thick fir tree during the months of hibernation. The number of bears and the frequency of twin and triplet cubs is a sign that the population is healthy and doing well. When people spot a mother bear with more cubs of different ages, it may well be that she has also 'adopted' a young one from the previous season. Female bears are compassionate and sharing. It's the young males who make trouble, "just as in most species", comments Rähni. In spite of the size of the population, bear attacks are extremely rare in Estonia and there is no record of a person being killed by a bear.

After the 'bear basics', a guide takes the guests to the hut. It's a hike of 2 km through the woods, a great last chance to stretch the legs before staying inside until the next morning.

The two huts — the only bear-watching facilities in the Estonian wilderness — have space for 9 people each, and cater to groups as well as individual nature lovers. The huts have windows in two directions, chairs, bunk beds and a toilet. There's no plumbing and no electricity but, of course, there is WiFi! Rähni developed the huts in a way that they would offer basic comfort and avoid disturbing the animals with light, noise and smells. One lovely feature is a sound system that brings outdoor sounds into the hut, so the guests feel truly immersed in wilderness, yet completely safe.

As the Coronavirus shut down international tourism during the most popular animal-watching season, local Estonians are starting to discover it. Until now, nature adventurers from Germany, Switzerland, Netherlands, the UK and Austria have made up the majority of clients for











NaTourEst. They were the first company to receive a group of nature tourists from Germany in May, just after the travel restrictions were lifted. Their services include all-round nature adventures, from kayaking trips to islets around Hiiumaa, to bog-walks, birdwatching, cycling tours etc. 2020 has hit the tourism industry hard worldwide. It seems, that nature travel might be a safe option during the pandemic — spending time in fresh air, with no crowds other than wild animals. Still, travelling to Estonia by airplane or ferry is the least safe part of the journey according to clients of NaTourEst. Therefore, Rähni has noticed an unusual upsurge of people travelling to Estonia all the way from Germany or the Netherlands by car. For the company, it's been an extraordinary summer, as Rähni comments: "Foreign tourists have started to return slowly but there are more and more Estonians. April and May gave us a big blow and now we hope that the virus doesn't flare up again. Right now, we have to administer an incredible amount of cancellations and new bookings at the same time."

But, back to the bear hide-out.

There is no guarantee for bears to visit the spot each and every night. In order to avoid the animals getting used to humans and dependent on feeding there is no bait apart from a few smells and small pieces of fish or a handful of grain: just enough to make them curious. So, luck is part of the authentic experience.

It is also a surprisingly calming experience. At first, it felt as though you had to be quick to see the animals, but after a little while a slow-down mode settles over the observers. You wait quietly and when you see an animal, there is no hurry — they don't run off scared. They are not being chased and just mind their own business quietly. We were lucky to already see the bear early in the evening and extensively. Nevertheless, you won't feel like leaving the hut in the middle of the forest with a young male bear in the vicinity. The rule is — you leave the hide-out at 8 am. So, when the dusk finally settles over the clearing, it's time to slumber in your sleeping bag to the lullaby of the birds.

More information at
natourest.ee

Events calendar: Highlights from October to December

Life in Estonia recommends



Tartu City Marathon @ Tartu
3rd of October

The Tartu City Marathon track, which runs on the streets of the historical university town, is considered one of the most exciting marathon courses in Estonia. The following distances will be open: marathon (42 km), half-marathon (21 km) and 10-km distance. The Nordic Walkers are also warmly welcome.

www.tartumaraton.ee/en
Tartu Maraton
Tartu Maraton



World Film Festival @ Tartu
5th — 11th of October

World Film Festival is an event dedicated to documentary cinema. The festival cultivates interest in an anthropological, analytical approach to cultures and societies, welcoming film entries from all over the world. Our film program turns attention to cultural exchange as well as cultural representations of everyday life around the world.

www.worldfilm.ee/en
worldfilmfestival
worldfilmfest



Saaremaa Rally @ Saaremaa
9th — 10th of October

The rally takes you across Saaremaa, Estonia's largest island — come enjoy the speed and colours of autumn.

www.saaremaarally.eu
Saaremaa Rally
rallysaaremaa



Jazzkaar Festival @ Tallinn
8th — 15th of October

The largest jazz festival in the Baltic states is coming again, this year in October. This 8-day festival features the hottest local and international jazz talents, filling the whole city with great sounds and activities.

www.jazzkaar.ee
jazzkaar
jazzkaar



Bocuse d'Or Europe @ Tallinn
15th — 16th of October

First held in 1987 and inspired by the atmosphere of sports competitions, Bocuse d'Or has been named the most important gastronomy competition in the world. The biggest names in the field will be present, and the combination of mastery, creativity, and flavours will lead the top ten to the finals in France early next year.

www.bocusedor.ee



Tallinn Restaurant Week @ Tallinn
1st — 7th of November

In the first week of November, Tallinn restaurants celebrate good food and the city becomes a foodie heaven. Tallinn Restaurant Week offers the opportunity to enjoy world-class restaurants serving quality cuisine at attractive prices.

www.tallinnrestaurantweek.ee
Tallinn Restaurant Week

Events calendar



PÖFF @ Tallinn
13th — 29th of November

Tallinn Black Nights Film Festival (PÖFF) is the largest, most distinctive film event in Northern Europe, and is considered among the leading film festivals in the world. The festival embraces a cluster of events, accommodating three full-blown sub-festivals: PÖFF Shorts, Just Film and Industry@Tallinn & Baltic Event.

poff.ee
festival poff
tallinnblacknightsff



Black Food Festival Tallinn @ Põhjala factory
21th of November

Having set out its stall in Berlin, London and New York in the last 12 months, the festival is now coming to the Põhjala factory in Tallinn. The aim is to open the door to culinary creativity and experimentation under the umbrella of an enjoyable city festival during some of the blackest nights of the year. Taste-wise, there'll be something for everybody!

www.blackfoodfest.ee
Black Food Festival Tallinn 2020
blackfoodfestival



Christmas hike @ Southern Estonia
25th of December

Every year on Christmas Day, a group of enthusiasts conquer the 20 highest hill peaks of Southern Estonia. The 7 to 10 hour walk along a 25km trail helps to make new friends every time. For the past few years, the participant count has reached over 200 people. It is a truly wonderful, out-of-the-box way to spend one the darkest days of the year.

www.ekstreempark.ee



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