ESA's 2025 Big Data Foundations for Earth Observation Training Course

Turning EO Research into a Viable Product or Service

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European Commission | researchLatvia Value Through Knowledge | Ministry of Education and Science Republic of Latvia | esa academy

Outline

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Kaupo Voormansik, CV

- Earth Observation company KappaZeta, co-founder (2015) and CEO (2019).
- Married, father of a son.
- PhD in Synthetic Aperture Radar applications (2014, University of Tartu).
- Double masters: computer science (2009, Uni. Tartu) and space studies (2009, International Space University).
- Systems engineer of 1st Estonian satellite ESTCube-1, 2009-2013.

Kaupo Voormansik, CV

- Trainee in DLR Microwave and Radar Institute (2011-2012 and 2014) – being the stupidest person in the room can be a good feeling.
- Head of Remote Sensing department in Tartu Observatory, 2015-2017.
- Estonian delegate in ESA Earth Observation programme board, 2014-2016.
- Space projects manager in AS Regio 2009-2013.
- 1179 citations according to Google Scholar, not bad, taken that science has not been our focus since 2017.

Your expectations

- for the lecture?

- for the day?

Why Earth Observation research?

- Fascination of maps and geography since childhood (from my father).
- Exact sciences nerd in school.
- To space topics thanks to Mart Noorma – inspiration and treating people well.

Why Earth Observation research?

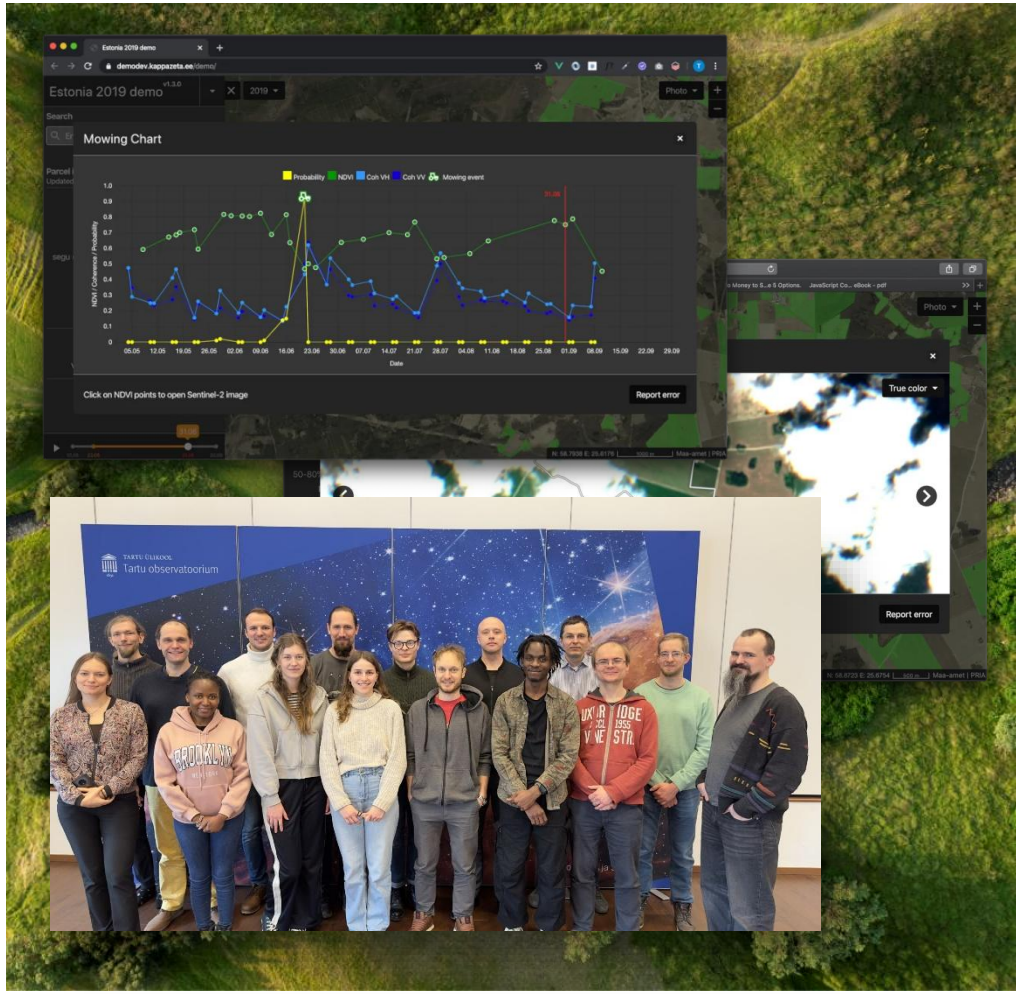
- Curiosity to understand things to the “bones”.
- Deep belief that there are no complex things, each “complex thing” can be decomposed into a finite number of extremely simple concepts.
- Fascination to synthetic aperture radar.

From EO research to EO services business, why?

- Being a young scientist: conferences, workshops, research papers, experiments…
- So much talented people willing to do the research. Applications looking 15 years ahead.
- So few willing to do the hard work to make the applications really work for the benefit of people.
- “Non-noble and boring” admin. and organizing work.
- Willing to see the change (somebody else should do the applications?) – be the change.

KappaZeta - Self-sustainable Earth Observation company

- 1.5-2M€ turnover in 2025
- ARR from Estonian and Danish gov. (via subcon. with DHI)
- Coordinator of a 6M€ European Defence Fund project
- 28 people team



Republic of Estonia Agricultural Registers and Information Board

Ministry of Food, Agriculture and Fisheries of Denmark
Danish Agricultural Agency

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Republic of Estonia Environment Agency

From Tartu Observatory SAR research group to KappaZeta

- Successful applied research about grassland monitoring and mowing detection.
- Seeing that Sentinel-1 repeat pass coherence works “so well”.
- Agricultural subsidy checks with satellite data - demand and job for a company not for a research institute.
- Born by a need for a service.

KappaZeta timeline

- 2012 – Kaupo Voormansik & Tanel Tamm meet 1st time, Tanel: “We should cooperate”. Tanel joining SAR research group.
- 2015 summer – breakthrough results for mowing detection with Sentinel-1 coherence.
- 2015 October – establishing KappaZeta (by Kaupo Voormansik, Karlis Zalite, Kalev Koppel and Tanel Tamm).
- 2017 May – first ESA project for applied research and pilots – KappaZeta starts to operate on its own budget, founders quit previous jobs.
- 2017-2019 – 5 people company, hard work for mowing detection service development.
- 2019 – Karlis and Kalev leave KappaZeta.

KappaZeta timeline

- 2020 – taking part in start-up accelerators, most notably the Superangel one with Kurt Lewin leadership and communication training by Gil Crosby.
- 2020-2025 – fast growth from 5 people to 28 people, revenue from 170k€ to 1.5M€.
- 2023 – agricultural monitoring service provider to Danish government (via subcontract with DHI), 2nd gov. client.
- 2023 autumn – Martin Jüssi joining KappaZeta (ex. head of space dep. CGI Estonia) - faster development for the 3D-SAR satellite mission.
- 2025 – coordinator of a large 6M€ European Defence Fund project.

How to make a successful Earth Observation company?
What we did right?

- Strong client and clear need for your work.
- “Sick optimism” – characteristic to all entrepreneurs.
- Resilient team, willing to do universalist work.
- Consistency.
- Good relations in the team. Take time for one-to-one and team meetings, it is part of your work.

How to make a successful Earth Observation company?
What we did right?

- Good relations with your clients and funding providers.
- Large scale testing. Long way from “works perfectly in 20 test fields” -> “works well in country-wide multi-season conditions”. Lots of hard work in early days, need for large representative training data sets.
- Manage the expectations of your client (previous point), can do even better than we did.

How to make a successful Earth Observation company?
What we did right?

- EU market is protectionist – make friends and go to sell with local partners.
- Avoid the trap of doing only ESA and other R&D projects – can be easier money, but whose service is actually better?
  Facing the real-world problems and client expectations.
- Sales and client relations development is a special work – it also needs talent and funding – is equally important with engineering and production.

How to do better than KappaZeta?
What we did wrong?

- Avoid doing everything on your own. Rely on partners and team members, who are better than you in certain tasks and roles.
- Don’t underestimate the communication and people management aspect. In the early days we did.
- Rely on good social science and “golden principles”:
  - With greatest pleasure people implement their own plans.
  - Nothing replaces good will.

How to do better than KappaZeta?
What we did wrong?

- Don’t underestimate the importance of networking.
  Go out of your office to find clients, develop partnerships, find future employees. Can be bigger impact than 2 extra hours of content work.

Problems in European EO business as of 2025 and ideas for solutions

Problem	Solution ideas
Too few procurements, many pilot & R&D funding options.	More B2G procurements, less grants! How to find strong leaders in public sector for B2G procurements? …
Fear of taking risk. What happens if a service procurement or a mission fails?	Adapt the concept of “failing forward”. Learn from mistakes and iterate to get better. More effective and faster progress than trying to foresee all possible risks. …

Problems in European EO business as of 2025 and ideas for solutions

Problem	Solution ideas
Impact of EO business is too often measured only in revenue. Consider a service that is offered for free as a public good, “0 revenue” but millions of users? For many EO services that is exactly the case.	Provoke a public debate. Together with talented economists propose good metrics for “fair” socio-economic impact measurement for EO services. Adapt the fair metrics in public debate. …

Problems in European EO business as of 2025 and ideas for solutions

Problem	Solution ideas
How to give fair reward for EO services and science that help to solve climate change and model our future with digital twins of Earth for more conscious and better decisions? Enormous benefits, humankind future is at stake, terribly underfunded. People want to buy and invest in things that contribute to their personal wealth. “Somebody else should do it! That is the problem of the state!” Show me a VC willing to invest in solving climate change. See next slide.	…

"Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders."

Source: https://x.com/Benioff/status/549339156854214656

Thank you!

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Questions?

Photo: Indrek Sünter 2021