

# LUMI AI Factory

## Service Portfolio

*Aleksi Kallio, Director, LUMI AI Factory Service Center*

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# Time to place our bets: Europe's AI opportunity

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[Jan Mischke](#), and [Guillaume Dagorret](#)



Boosting Europe's competitiveness across the AI value chain.



Services to unlock  
research, development and  
innovation potential in AI

# Services: **TALENT**

**LUMI** AI Factory



## Training the latest skills & technology

- **Co-create with AI centers**
- Provide **structured training paths** for AI and HPC
- **Tailor training** for different domains



## Consultation with company focus

- Remove friction with **starter pack & feasibility analysis**
- Weave AI Factory into **existing networks and ecosystems**



## Focus on AI adoption

- Offer **time-limited interventions** to step up AI adoption in companies' RDI
- **Long-term access** to the platform, support and training
- Support in applying for **large resources** & providing **fast lanes**



## AI Factory Hub: engage the next-generation talent

- **Co-working hub** on grounds of Aalto University & ELLIS Institute
- Network of satellite hubs & virtual co-working space
- Running & supporting **hackathons, challenges and accelerators**

# AI adoption showcases on LUMI

# LUMI AI Factory

**LUMI**

MACHINE VISION / MACHINE LEARNING

## AI-powered biometric identification

**CANDOUR IDENTITY** developed an identification method based on facial recognition. Candour's technology tried to find a balance between speed and reliability. The application had to be pleasant to use, meaning identification had to be easy and fast – but errors could not occur.

**IMPACT:** AI-Model accuracy improved by tens of per cent. Recognition improved significantly and errors were reduced. Using the LUMI supercomputer significantly reduced product development time and made it easier to bring the superior technology to customers.



👉 [Read whole story behind the QR code.](#)

**FINISH START-UPS HAVE AN EXCEPTIONAL COMPETITIVE ADVANTAGE. THIS IS SOMETHING THAT SHOULD BE ANNOUNCED MORE LOUDLY.**

**Hari Koskimäki, COO:**

Originally Oulu university-based start-up company, which foundation lies in three decades of academic research in machine vision and machine learning.

**CANDOUR IDENTITY, a global online identity verification company.**

**LUMI**

MACHINE LEARNING

## Improving the efficiency of healthcare client encounters

**GOSTA LABS** has developed an AI assistant to automate clinical note generation and streamline documentation in healthcare and social care. They emphasize high-level data protection with strict controls on language model training. Gosta Labs contributes to the European healthcare AI ecosystem, their machine learning models were trained using the LUMI Supercomputer.

**IMPACT:** Gosta Labs improved models' performance and resource efficiency, while also offering an environment-independent alternative to closed large language models from a data protection perspective. They achieved the scalability needed to produce the necessary European data sets for training and to train models for multiple European languages.

👉 [Read whole story behind the QR code.](#)

**Heidi Verhulst, CEO:**

Our development efforts have been praised by data protection teams in healthcare organizations.

**GOSTA LABS** is a Finnish healthcare and social care technology company that develops machine learning models to improve patient care and medical practice.

The company's flagship product is the AI assistant Gosta Aide.




**LUMI**

MACHINE VISION / MACHINE LEARNING

## AI-based Data Analysis of Satellite Images

**ICEYE** makes the radar signal computationally visible and produces analytics of what the images show. The company has imaged and investigated, among other things, floods and wildfires. Datasets with lots of testcases are typically a challenge considering the data transfer, storage and the memory capacity need with computing.

**IMPACT:** ICEYE's cost-efficient computing and data storage and the great computing speed enabled ambitious experimenting even with the most demanding AI-models to get the best automated image interpretation of the satellite images.



👉 [Read whole story behind the QR code.](#)

**Timo Pitkärä, Senior Machine Learning Engineer:**

The very best experts supported us in the deployment process. I was able to move on to doing things that are part of my core competences.

**ICEYE** is a space technology company whose microsatellites deliver real-time radar (SAR) images from anywhere, at any time of the day and under any weather conditions.

ICEYE operates internationally with offices in Finland, Poland, Spain, the UK, Australia, Japan, UAE, Greece, and the US.

**LUMI**

MACHINE VISION / MACHINE LEARNING

## AI technology for people counting

**SUPERIGHT** developed its machine vision model with total privacy protection. The solution is a mobile phone, a supercomputer, and a working AI model. A large scale processing of visual datasets and development of advanced artificial intelligence models require the simultaneous processing of huge amounts of data. Parallel computing speeds up the training of neural networks to develop an AI model.

**IMPACT:** Superight significantly accelerated the testing and modification of its AI model and achieved 99% accuracy for people counting. The AI model is now the most accurate in its industry worldwide.



👉 [Read whole story behind the QR code.](#)

**Elina Penttinen, CEO:**

Everyone in this field needs to look ahead to maintain and further develop competitiveness. So do we by utilizing LUMI.

**SUPERIGHT** is turning smartphones into ready-to-use smart sensors. The solution provides the highest level of precision, cyber security and privacy protection.

They developed an AI model with 99% accuracy in people counting and with total privacy protection.

**LUMI**

MACHINE VISION / MACHINE LEARNING

## Human posture estimation technology

**TOP DATA SCIENCE** is a partner in the ASA project (AI for Situational Awareness). The company used state-of-the-art human posture estimation technology. Posture estimation application areas include e.g. remote healthcare and elderly care fall detection, security cameras and autonomous vehicles. The process required hundreds of video clips from which human posture estimation can be extracted for training the neural network of the skeleton.

**IMPACT:** Many computationally demanding tasks were outsourced to the LUMI supercomputer and successfully created a human body trajectory dataset that is utilized in the ASA project. LUMI is ideal for performing multiple parallel tasks on GPUs.



👉 [Read whole story behind the QR code.](#)

**Essiina Huhtala, Lead Data Scientist:**

Everything went smoothly. LUMI exceeded expectations in terms of functionality and ease of use. The documentation was a great resource.

**TOP DATA SCIENCE** is a company specializing in artificial intelligence, machine learning and related software engineering services.

The company develops and implements solutions based especially on computer vision technologies that use video or image data.

**LUMI**

MACHINE VISION / MACHINE LEARNING

## Developing the future of engineered wood products with AI

**RAUTE** helps its customers to make the most efficient and effective use of wood raw materials, so that the industry can make better use of renewable and carbon-storing wood based materials. They use machine vision to identify the properties of wood materials. Teaching machine vision is computationally intensive work.

**IMPACT:** Real calculation results – one calculation round on the LUMI was performed ten times faster than with normal methods. Raute's high-level research on a world-class LUMI supercomputer, and the results can be used by their customers around the world, increasing competitiveness worldwide.



👉 [Read whole story behind the QR code.](#)

**Joona Edlinen, Head of Marketing and Communications:**

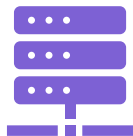
LUMI is a natural fit for us, as we share the same values and goals that contribute to our common climate work.

**RAUTE CORPORATION** is a global group that develops and supplies technology and services to the wood industry.

Raute is the market leader in veneer, plywood, and LV manufacturing technology and the only company in the world able to offer customers a complete mill-level solution.

## Services: COMPUTE



### Computing capacity never seen before

- Globally **leading AI training with massive GPU capacity and fast & large data storage (shared & dedicated)**
- **AI model serving at scale for "every open model out there"**
- **Customisable environments** with virtual clusters to match every need
- API-based access and recipes for **automation and public cloud integration**
- **Quantum capacity** for next-level QC-AI

## LUMI AI Factory



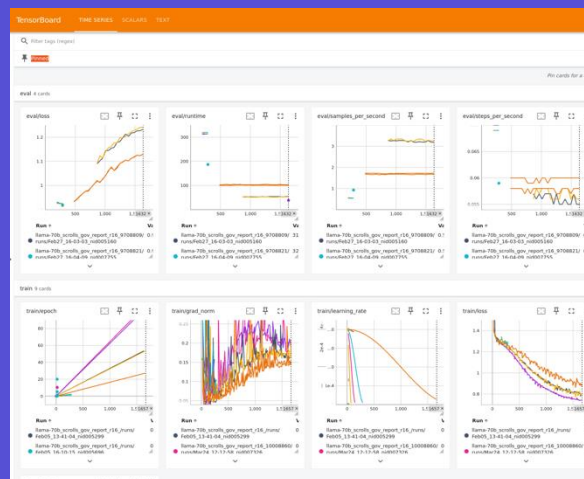
### Expert support all the way

- **Friendly human support** for getting started and all the way to deep AI methods and scalability
- Accelerated adoption with **self-service environment, thorough documentation and AI assistants**
- Supported **MLOps environment** and recipes

# Showcasing the AI environment

The LUMI dashboard interface includes the following sections:

- Pinned Apps:** A grid of application icons including Home Directory, Compute node shell, Login node shell, Desktop, Cloud storage configuration, Disk quotas, Project view, Active Jobs, Jupyter, Jupyter for courses, Julia-Jupyter, MATLAB, MLflow, TensorBoard, and Visual Studio Code.
- Notifications:** A section with a search bar and a button to "Show all hidden warnings (1 warnings)".
- Usage metrics:** Two large circular progress indicators showing "CPUs allocated" at 183179 and "GPUs allocated" at 17481.



The interface shows a "Ready!" status with a progress bar indicating the following steps: "Waiting in the queue", "Allocating resources", "Preparing folders", "Pulling container image", "Starting session", and "Ready: Operating session". Below this, there is a "Jupyter" button and a card for "Aito - LLM inference" with a description and an "OPEN" button.

## Services: DATA

**LUMI** AI Factory



### Data access is the priority

- Make data manageable with **cloud-like data environment**
- **Datasets-as-a-Service:** previously inaccessible datasets made available
- Remove data access barriers with **sensitive data services and access authorisation mechanisms**
- Direct connections to **data spaces and data repositories**



### Data support that goes the extra mile

- **Data team for sourcing, negotiating and curating high-value datasets**
- Help with the necessities: data wrangling & data engineering
- Support **streaming data** into the supercomputer



# Showcases of unique datasets

**LUMI** AI Factory



## OWI Stats

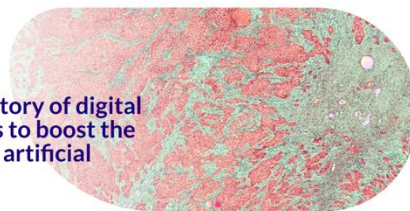
<b>4.02</b> Billion URLs crawled	<b>185</b> different languages	<b>28</b> Million Hosts	<b>755.00</b> Total TiB crawled
<b>1</b> TiB crawled per day	<b>147</b> WARC Datasets	<b>17.48</b> TiB Size of Open Web Index	<b>28.83</b> TiB Size of WARC Datasets
			<b>346</b> Public Datasets



# Destination Earth



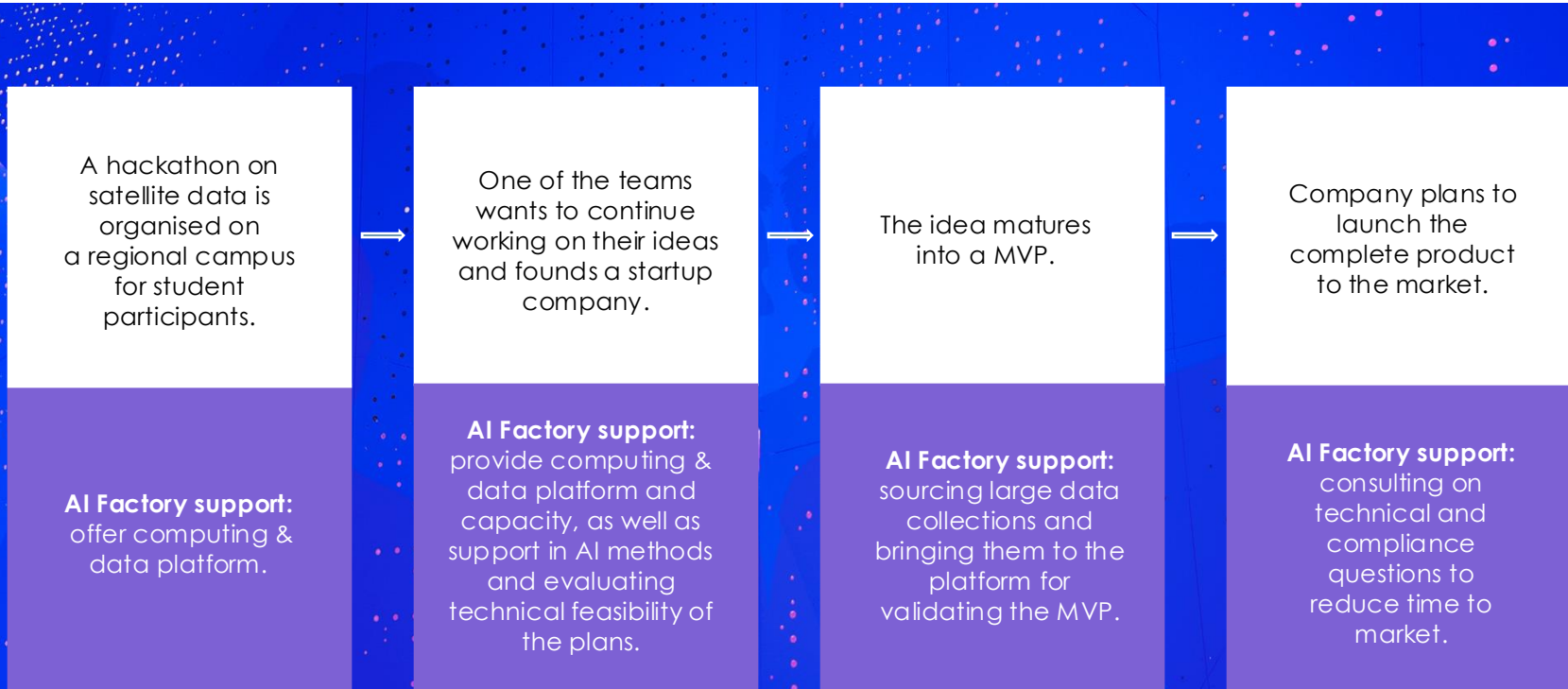
A central repository of digital pathology slides to boost the development of artificial intelligence



# How are services offered?

- Services for **Research, Development and Innovation (RDI) purposes only**.
- **Basic principle: services (capacity, training, consultation) free of charge for startups, SME's, research and public sector.** For large companies services are fee-based.
- **Initially using LUMI access rules and next adopting AI Factory access rules (more support for AI innovation)**
- Large computing resources are granted through **access calls with expedited processing**. Most calls require certain level of opening of results.
- Looking to continue collaboration with **Business Finland and corresponding national mechanisms** for allocations to company use with fully closed results.

# Customer journey into one-stop-shop



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**LUMI** AI Factory

Manufacturing company looking to automate quality control with AI.

**AI Factory support:**  
Starting with consultation and crash course on AI methods for key personnel. Following with a support intervention to help launch RDI project.

SME working on autonomous vehicles identifies collaboration potential with an academic group working on computer vision. Unique dataset of snowy, rainy and slushy dashcam images is collected.

**AI Factory support:**  
Capacity is provided to train world-leading open foundational model for adverse weather photos. Work continues to develop tailored closed models on AI Factory capacity. Finally, application prototyping is supported with model serving platform.

A medical research group is looking to work on sensitive large imaging datasets.

**AI Factory support:**  
Providing data, and computing services for developing novel methods. Evaluating them on new datasets (sensitive model serving) for several stages of evaluation and productisation.

Sometimes AI Factory services are best offered from another one-stop-shop, support center or network.

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# LUMI AI Factory

Contact us through [lumi-supercomputer.eu](https://lumi-supercomputer.eu)



**EuroHPC**  
Joint Undertaking



**EUROPEAN UNION**  
European Structural and Investment Fund

