A photograph of two young women with dark hair, looking upwards and slightly to the right. They are in a dark environment, possibly at night, with warm, out-of-focus lights (bokeh) in the background. The woman on the left is holding a small, glowing green object in her hands. The overall mood is hopeful and aspirational.

Imagine a world where limitless
connectivity means limitless possibility



This is Ericsson



Employees worldwide

101,300

27,400 dedicated to R&D
28,000 managed services

BSEK in R&D budget

42

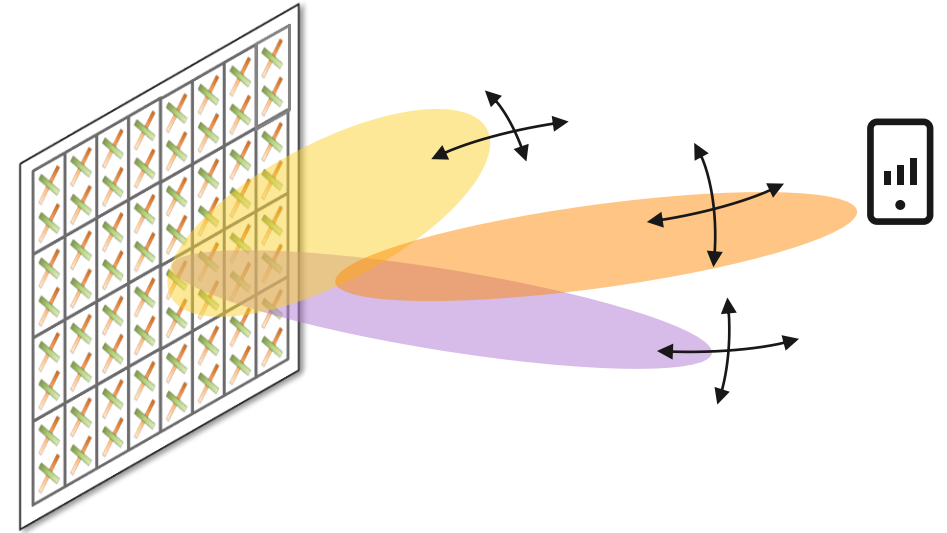
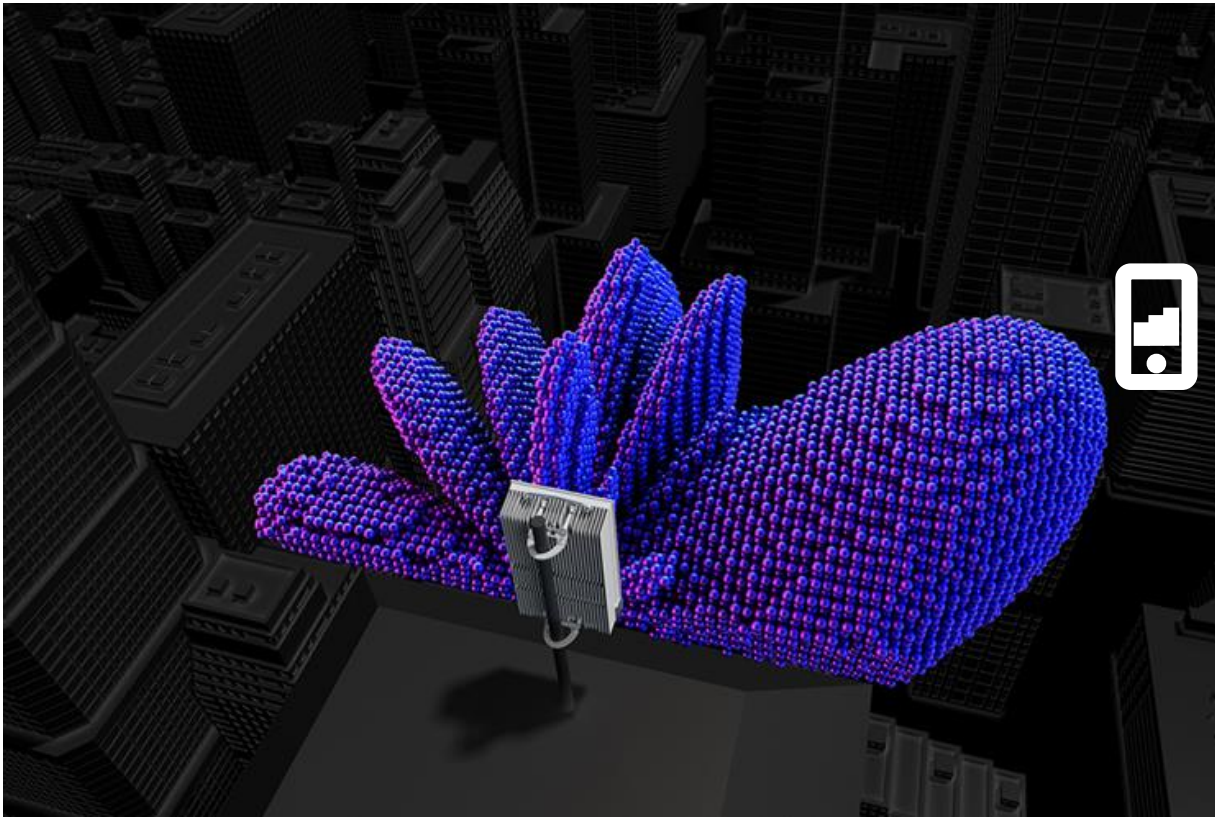
60,000 granted patents

BSEK in sales

232

more than 180 countries

MIMO Systems



The physical radio channel from base station to user is a MIMO LTI system.

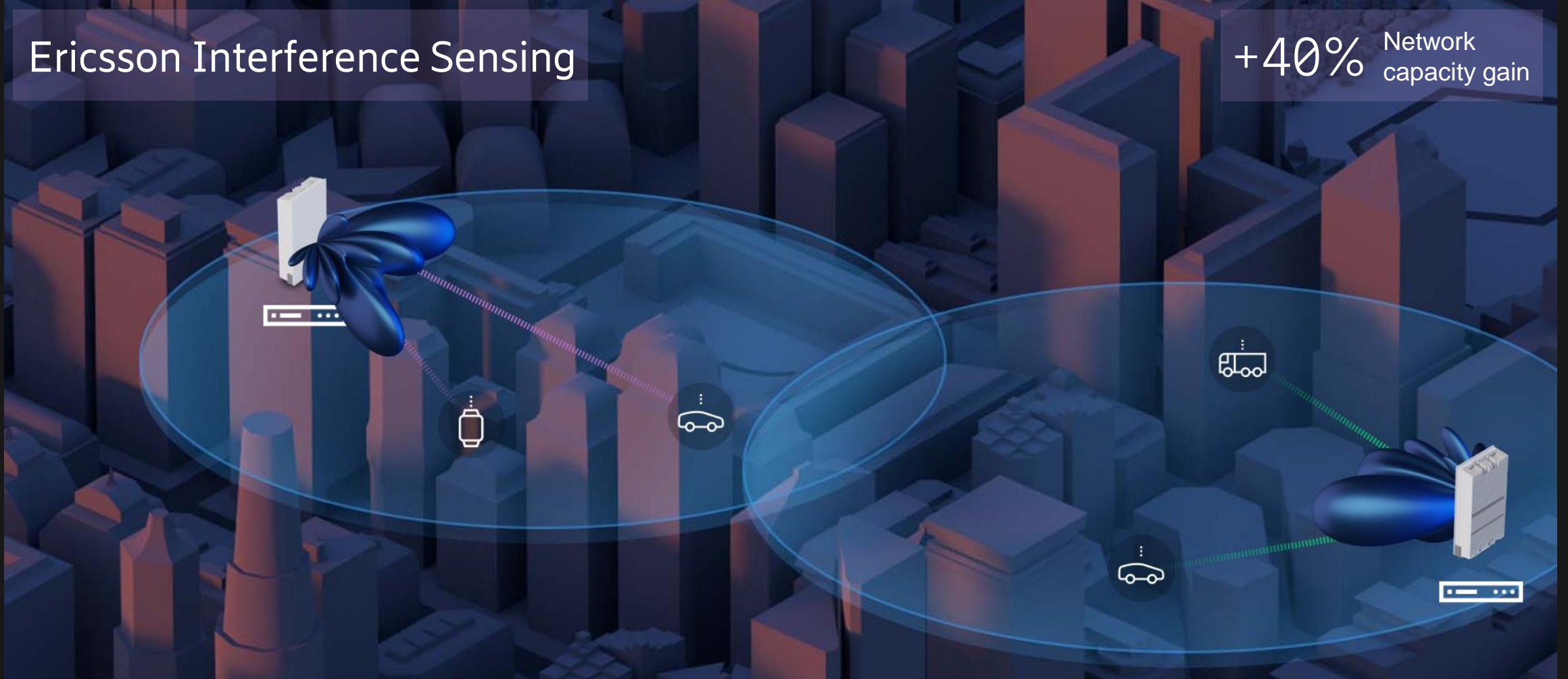
$$\begin{bmatrix} G_{11}(s) & G_{12}(s) & \dots & G_{1,N_t}(s) \\ \vdots & \vdots & & \vdots \\ G_{N_r,1}(s) & G_{N_r,2}(s) & \dots & G_{N_r,N_t}(s) \end{bmatrix}$$

Many control challenges!

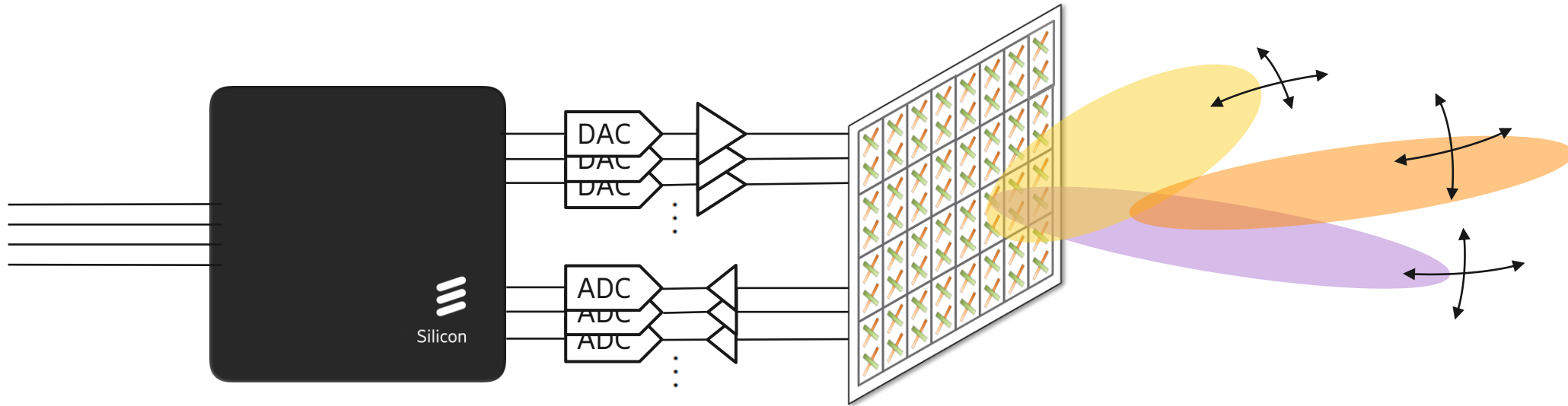


Ericsson Interference Sensing

+40% Network capacity gain



MIMO Processing



Demanding and massively parallel computations:

- Filtering
- Correction
- Calibration

- ➔ [Power-optimal algorithms for next-gen mmWave](#)
- ➔ [Advanced optimization for 5G radio algorithms](#)
- ➔ [Nonlinear system identification of multistage power amplifiers](#)

AI/ML-Based Positioning from Channel Estimates



Every possible user position has unique radio channel to the base station – a “fingerprint”!

Thesis objective:

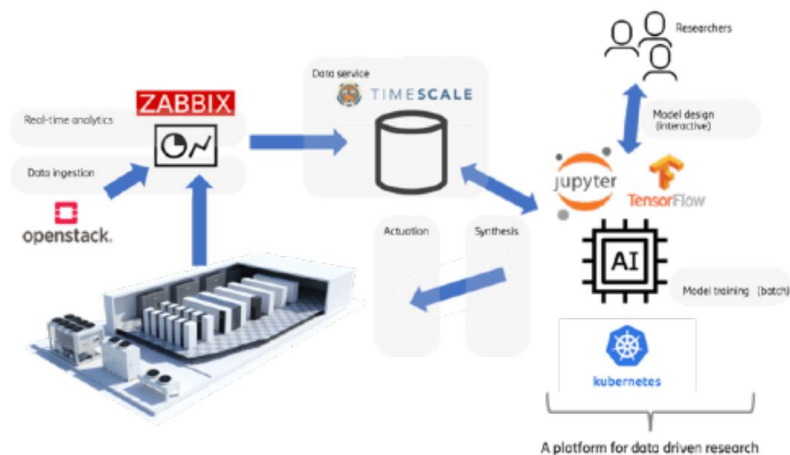
Configure, train and evaluate an AI/ML network predicting the user location from real radio channel estimates



→ [Synthetically trained AI/ML network for mobile positioning](#)

Operations Data Portal – Background

Collaboration with Ericsson Research, Umeå & Lund University



10-20 GB/day - Log data and metrics



- [TV Interview about energy-efficient data centres on SVT](#) (January 2022)
- [TV Interview about energy-efficient data centres on TV4](#) (January 2022)
- [Interview / article on Energy Efficient data centres in Forskning & Framsteg](#) (February 2022)
- UmU press release on energy efficiency research.

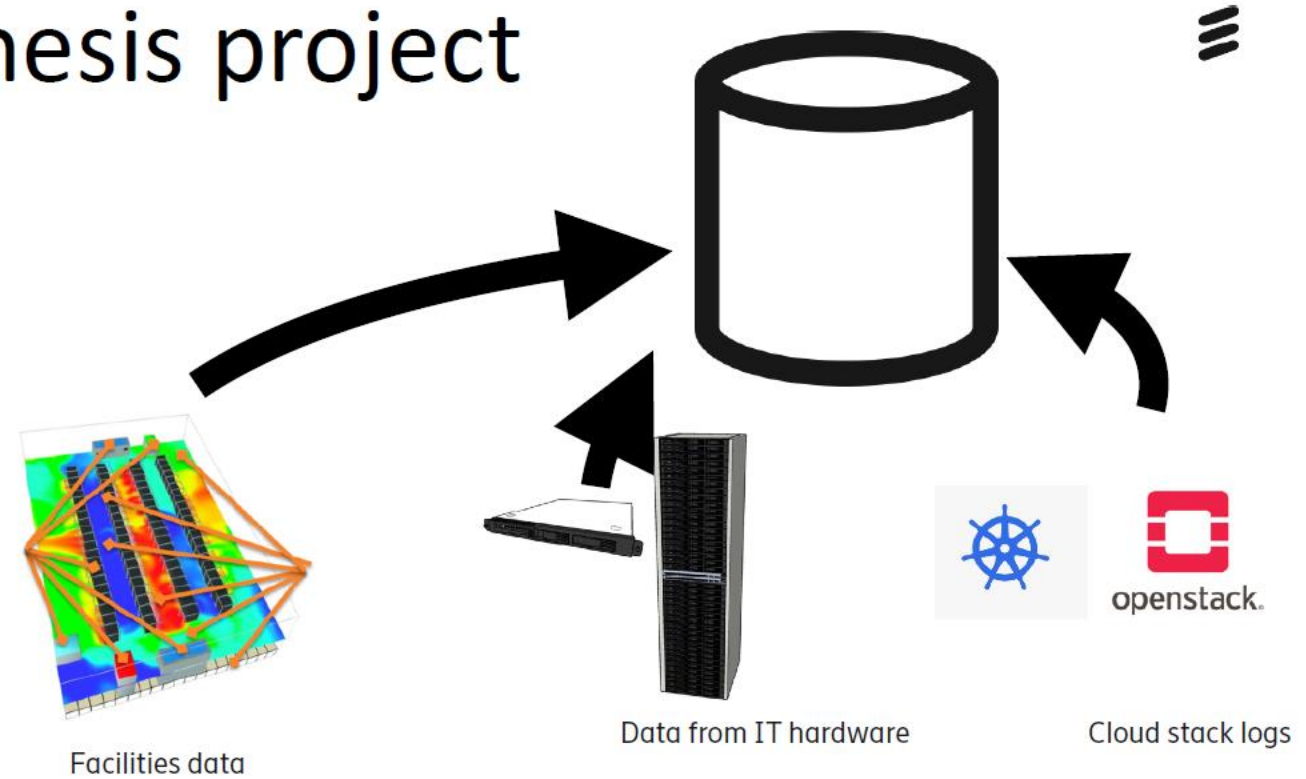
➔ Contact person: Joakim Persson <joakim.m.persson@ericsson.com>

Operations Data Portal - Thesis project

Ericsson Research,
contact person: Joakim Persson <joakim.m.persson@ericsson.com>

6G networks are expected to be highly automated and data-driven operations will be required to make this a reality. Technology components such as AI and ML will be key in these large and complex systems. However, for efficient AI/ML systems large datasets for training are required. To this end Ericsson Research and Umeå University has set out to create a community around operations data. The first step was the WCIB project (<https://www.umu.se/en/research/projects/wcib-wara-common-information-bridge/>) where we created one of the largest open repositories of live operational data.

This made the news both at SVT and TV4. Now we are making it bigger and we are inviting external partners to share their data on the WCIB data portal. However, this is not trivial and a new design is needed. Data is possibly sensitive and leakage is not acceptable. In this thesis project you will be providing the architecture for a cloud platform for secure storing and data sharing. This includes, supporting integration of modules for data anonymization, fine-grained access control, and integration with some compute and analysis framework. You should be interested in prototyping large scale AI system and have a good understanding of Linux, Python and preferably also NodeJS.





contact: olof.troeng@ericsson.com



Imagine Possible

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