

DC14

Individual Research Project title – **Machine learning based environment awareness for enhanced communication and sensing**

Lead beneficiary (place of employment) – **LUNDS UNIVERSITET (LU)**, PARADISGATAN 5c, LUND 22100, Sweden

Secondment at – **TAMPEREEN KORKEAKOULUSAATIO SR (TAU)**, KALEVANTIE 4, 33100, TAMPERE, Finland and **ERICSSON AB (ERS)**, TORSHAMNSGATAN 23, STOCKHOLM, 164 80, Sweden

Supervisory team - Academic: Prof. Ove Edfors (ULUND); Industry: Dr. Anders Berkeman (ERS); Mentor: Prof. Mikko Valkama (TAU)

Project tasks and objectives - Address environmental awareness based on a combination of ray tracing and network measurements. Map data will be used to provide an initial model for the local environment and this will be successively refined by measurements in the network itself as well as between user equipment and the dense distributed UmMIMO antenna elements.

Expected Results - A ML framework for environmental awareness, where the initial model comes from ray tracing simulations and where the environmental model is successively improved based on in-situ measurements by the wireless network itself.

Planned secondment(s) objective -: to train, evaluate and tune ML networks and refine raytracing models using existing channel data from measurements and raytracing models, both representing the same geographical area and to generate new channel data from measurements with their network equipment and from their 3D-maps and ray-tracing tool. And to analyze transfer learning methods to generate a first site specific model based on ray tracing from a single generic network model.

Eligibility: - University master's degree and be eligible to enroll in a PhD program. Knowledge in fields related to Telecommunications (or closely related disciplines) is appreciated. A high level of English language is required. International experience is appreciated. Research experience and good communication skills are appreciated. Not have resided or carried out their main activity (work, studies, etc.) in Poland for more than 12 months in the 36 months immediately before the recruitment date. Non EU-candidates should have preferably an EU working permit.

Evaluated criteria –

- Study records, including Bachelor and Master
- Work & research experience
- Motivation
- Letters of recommendation
- Positive attitude, previous mobility experience, good communication skills
- English proficiency and other languages

Preferred starting date- June 2024 (as soon as possible)

Trial period – 6 months

Target degree - PhD degree from – **LUNDS UNIVERSITET**

Approximate gross salary –

The gross salary includes monthly allowances of EUR 3.400 (living), EUR 600 (mobility) and EUR 660 (family, if applicable), in agreement with the MSCA Doctoral Network financial regulations. These allowances are subject to compulsory deductions under national law, such as employer and employee social security contributions and direct taxes and also a country correction coefficient applies to the living allowance in order to ensure equal treatment and purchasing power parity for all researchers. Please check the applicable deductions in the respective country of the beneficiary

Working and living conditions –

Detailed information about Sweden: <https://www.oecdbetterlifeindex.org/countries/sweden/>

Detailed information about Finland: <https://www.oecdbetterlifeindex.org/countries/finland/>

LUNDS UNIVERSITET was founded in 1666. There are about 45,000 students and more than 8,000 employees in Lund, Helsingborg, Malmö and Ljungbyhed. We are united in our quest to understand, explain and improve our world and the human condition. Lund University is regularly ranked as one of the world's leading universities. Lund is one of the country's most attractive study locations, and have one of Scandinavia's broadest educational offerings based on boundary-crossing and leading research. Turnover amounts to SEK 9.9 billion, of which two-thirds goes to research and one-third to education. The university has a clear international profile with partner universities in around 75 countries.

Website: <https://www.lu.se/start>

TAMPEREEN KORKEAKOULUSAATIO The Tampere Universities community comprises Tampere University and Tampere University of Applied Sciences. Together we are building a new model for higher education and research in Finland. Tampere Universities came into being at the beginning of 2019 when the University of Tampere and Tampere University of Technology were merged to create the new foundation-based Tampere University that maintains close collaboration with Tampere University of Applied Sciences.

Website: <https://www.tuni.fi/en>

L M ERICSSON AB is a provider of networking and telecommunications products and services. The company offers services, software, and infrastructure in the areas of mobility, broadband, and cloud. Ericsson's products and services assist telecom operators and other businesses improve operational efficiency. The company's primary offering includes network infrastructure for mobile and fixed communication, such as 2G, 3G, and 4G radio networks, and IP core and transport networks. Ericsson also offers learning services, support services, network roll-out, device and network testing, core and cloud consulting, and digital transformation consulting services. The company has business presence in Europe, North America, Asia-Pacific, Latin America, Africa and the Middle East. Ericsson is headquartered in Kista, Stockholm, Sweden

Website: <https://www.ericsson.com/en>