

DC15

Individual Research Project title – **User Equipment aspects of ultra-massive MIMO**

Lead beneficiary (place of employment) – **ERICSSON AB** (ERS), TORSHAMNSGATAN 23, STOCKHOLM, 164 80, Sweden

Secondment at – **UNIVERSIDADE NOVA DE LISBOA**, having its registered office or based in CAMPUS DE CAMPOLIDE, LISBOA, 1099 085, Portugal and **LUNDS UNIVERSITET** (LU), PARADISGATAN 5c, LUND 22100, Sweden

Supervisory team - Academic: Prof. Liang Liu (ULUND); Industrial: Dr. Henrik Sjöland (ERS); Mentor: Prof. João Guerreiro (UNL)

Project tasks and objectives - Analyze multi-antenna solutions for UmMIMO within wireless devices (UE). Evaluations of antenna configurations and signal processing requirements for different device form factors. Both communication and sensing use cases will be studied. Understand and quantify the potential benefits of using multiple antennas in an UmMIMO UE operating at carrier frequencies up to the mmW range. Develop efficient signalling and signal processing methods with a minimum of power consumption and signalling overhead.

Expected Result - Characterize benefits of multiple antennas in terms of increased performance for mobility and relaxed requirements on network frequency synchronization. Development of the required signalling, signal processing methods, and antenna configurations.

Planned secondment(s) objectives - to analyse the potential benefits of using multiple antennas at the UE and work on low complexity algorithms for joint communication and sensing at the UE side. And to study single-carrier options for the uplink transmission.

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 Portugal: <https://www.oecdbetterlifeindex.org/countries/portugal/>

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>

UNIVERSIDADE NOVA DE LISBOA, popularly known as "a Nova" (The New), is a public law institution, created in 1973, within the framework of a policy of expansion and renewal of studies university students in Portugal. It is based in Lisbon. The UNL is a federal university, encompassing the following federated study and research units.

Faculty of Sciences and Technology;
Faculty of Social and Human Sciences;
Faculty of Medical Sciences;
Faculty of Economics;
Faculty of Law (FDUNL);
Higher Institute of Statistics and Information Management;
Institute of Chemical Technology and Biology
Institute of Hygiene and Tropical Medicine;
National School of Public Health.

The rectorate and several units of the UNL are installed on a campus and other buildings located in the municipalities of Lisbon, Almada and Oeiras. The Monte de Caparica campus, in the municipality of Almada, where the faculty of science and technology is located, is one of the largest campuses in Europe.

Website: <https://www.unl.pt/en>

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>