

DC10

Individual Research Project title – **Positioning and tracking of non-connected objects for vehicular safety with mmW frequencies**

Lead beneficiary (place of employment) – **OY L M ERICSSON AB** (ERF), JORVAS, JORVAS 02420, Finland and - **TAMPEREEN KORKEAKOULUSAATIO SR** (Tampere University, TAU), KALEVANTIE 4, 33100, TAMPERE, Finland.

Secondment at - **UNIVERSIDAD AUTONOMA DE BARCELONA (UAB)**, EDIF A, CAMPUS DE LA UAB BELLATERRA CERDANYOLA V, CERDANYOLA DEL VALLES 08193, Spain,

Supervisory team - Academic: Prof. E. Simona Lohan, Prof. Mikko Valkama (TAU); Industry: Julia Vinogradova (ERF); Mentor: Prof. Gonzalo Seco-Granados (UAB)

Project tasks and objectives - Propose sensing-based positioning enhancements of non-connected vehicles when sensing is done by the cellular network, based on UmMIMO and backscattered mmW signals, and positioning is done either at the vehicle side, or at the network side, or both. Parameter estimation and tracking of relevant parameters (Doppler, angle, etc.) will be performed to support and enhance the positioning performance in vehicular scenarios. Besides, collision detection and prevention metrics will be developed based on mmW sensing.

Expected Results - Advanced sensing-based models for accurate positioning and tracking of vehicles; novel parameter estimation algorithms; collision detection and prevention mechanisms based on sensing the vehicular environment.

Planned secondment objectives - to work on parameter-estimation theoretical bounds and to collect relevant data in UAB living lab.

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 Finland 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. Note: for the selected candidate, an English certificate in accordance with TAU regulations is needed for the PhD enrollment at TAU (see [admissions webpage](#)) before the contract can start

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

Trial period – 6 months

Target degree - PhD degree from — **TAMPERE UNIVERSITY (TAU), TAMPERE, Finland.**

Approximate gross salary –

3 250€ for a fellow without family

3 700€ for a fellow with family (e.g., married/in recognized relationship/with children)

In addition to this, the fellow will get yearly holiday bonus and increments based on the labor agreement.

Working and living conditions –

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

Detailed information about Spain: <https://www.oecdbetterlifeindex.org/countries/spain/>

OY 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>

TAMPERE UNIVERSITY 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. One of the research spearheads at TAU deals with new enabling technology for future wireless networks, with specific emphasis on 5G evolution and future 6G networks.

Website: <https://www.tuni.fi/en> and <https://www.tuni.fi/en/about-us/communications-engineering-and-radio-systems>

UNIVERSIDAD AUTONOMA DE BARCELONA is a public university mostly located in Cerdanyola del Vallès, near the city of Barcelona in Catalonia, Spain. As of 2012, the university consists of 57 departments in the experimental, life, social and human sciences, spread among 13 faculties/schools. All these centers together award a total of 85 qualifications in the form of first degrees, diplomas, and engineering degrees. Moreover, almost 80 doctoral programs, and more than 80 other postgraduate programs are offered. UAB has more than 40,000 students and more than 3,600 academic and research staff. UAB is a pioneering institution in terms of fostering research. There are many research institutes in the campus, as well as other research centers, technical support services, and service-providing laboratories, and the ALBA (synchrotron) located in the Barcelona Synchrotron Park is very close to UAB. UAB is the best university in Spain according to the 2023 QS World University Rankings, which ranked the university 178th overall in the world. Its subject rankings were: 27th in Veterinary Science, 72nd in Education & Training, 73rd in Linguistics, 78th in Sociology and 88th in Economics & Econometrics. The UAB is also a degree-awarding body of the prestigious Institut Barcelona d'Estudis Internacionals (IBEI).

Website: www.uab.cat