

DC05

Individual Research Project title - **mm-Wave positioning and sensing for aerial-user Applications**

Lead beneficiary (place of employment) – **TAMPEREEN KORKEAKOULUSAATIO SR** (Tampere University, TAU), KALEVANTIE 4, 33100, TAMPERE, Finland and **ALTYS TECHNOLOGIES (ALT)**, AVENUE PARMENTIER, CENTRAL PARC II, TOULOUSE 31200, France

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 (TAU), Prof. Mikko Valkama (TAU); Industry: Fathia BEN SLAMA (ALT); Mentor: Prof. Jose A. López-Salcedo (UAB)

Project tasks and objectives - This project will propose novel integrated positioning and sensing/imaging algorithms with advanced mmW cellular signals (5G/6G) and UmMIMO at the base station side. The performance under fixed base stations (e.g., installed in airports or on the roof of the buildings) will be compared with the one with mobile base stations installed on-board of aerial vehicles to provide environment surveillance such as malicious-node sensing. Novel LOS/NLOS detection mechanisms will be provided based on mmW and UmMIMO.

Expected Results - Accurate integrated positioning and sensing solutions with low complexity burden on air traffic management infrastructure; novel mmW and UmMIMO positioning and sensing algorithms; new LOS detection methods to increase robustness in airport and aerial users.

Planned secondment objectives - to work on joint waveform design and theoretical performance bounds.

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/month–

At TAU, Finland (first 18 months)

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.

At Altys, France (the next 18 months)

3 350€/ for a fellow without family

3 840€ for a fellow with family (e.g., married/in recognized relationship/with children)

Working and living conditions –

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

Detailed information about France: <https://www.oecdbetterlifeindex.org/countries/france/>

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

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>

ALTYS TECHNOLOGIES is an international engineering company committed to providing dependable digital CNS and business intelligence systems to industries around the globe. Headquartered in Toulouse, France, and with a US subsidiary based in Florida, the company has a sound expertise in the aerospace sector, and is dedicated to designing airborne and ground communications systems, robust monitoring solutions, and data analytics in support to a safer, more efficient airspace use with reduced operational costs. Since 2000, ALTYS Technologies has been fully involved with all major European and U.S. data link programs, consistently delivering its solutions to major actors in the aerospace and civil aviation sectors.

Website: <https://altys-tech.net>

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