Job Description

MetaWireless Early Stage Researchers
Telefonica Research (Telefónica Investigación y Desarrollo)
Barcelona/Madrid, Spain

Telefonica Research in Spain is seeking to appoint one high-calibre Early Stage Researchers (ESRs) to join the Marie Skłodowska-Curie Innovative Training Network on '**Future Wireless Communications Empowered by Reconfigurable Intelligent Meta-Surfaces** (MetaWireless)'.

Position	Early Stage Researcher
	- TID-1: Real-time engine for orchestrating the control plane in RIS-based wireless networks (RIS = reconfigurable intelligent surfaces)
Location:	Telefonica Research. Ronda de la Comunicación s/n, DISTRITO C. Madrid 28050, Madrid. Spain.
Working Time:	Full Time
Duration:	Fixed-Term (3 years)
Salary:	In agreement with the MSCA-ITN financial regulations (http://ec.europa.eu/research/participants/data/ref/h2020/other/guides_for_applicants/h2020-guide-appl-msca-itn_en.pdf)

About MetaWireless

Wireless connectivity has become a pillar of our society. The growth of wireless traffic is relentless, forecast to reach a staggering worldwide aggregate of 5,016 exabytes by 2030, along with bit rates of 1 Tb/s and new services related to sensing, localization, low-latency, and ultra-reliability. While the performance of wireless networks has improved phenomenally over the last decades, progress is by now pushing against fundamental limits and the mechanisms that have sustained these huge improvements are starting to falter. New evolutionary leaps are called for in order to ensure that the aforementioned forecasts can become a reality. To date, every wireless system has abided by the premise that the propagation radio channel is fixed by nature and cannot be tampered with, but only compensated through ever more sophisticated transmission/reception schemes. A potential evolutionary leap for 6G-and-beyond networks is to break free from the postulate that channels are uncontrollable factors. Serving such a vision, MetaWireless pursues the disruptive idea of designing wireless networks by treating the environment itself as a quantity to be controlled and optimized. Precisely, the manipulation of the wireless environment can be made possible by incorporating reconfigurable intelligent surfaces. These are planar structures, made of meta-materials and electromagnetically discontinuous, which do not adhere to conventional reflection and diffraction laws; rather, they can modify in a controllable fashion the phase and wavefront of impinging radio waves. If deployed to coat objects, walls, or building facades, they could allow customizing in real time the electromagnetic response of environments. Making this vision a reality requires the training of a new generation of researchers and a multidisciplinary effort involving wireless communications, physics, electromagnetic theory, and computational learning, which are the ingredients that define the MetaWireless project.

The Role

TID-1 will be hosted by Telefonica Research, with offices in Barcelona and Madrid, Spain. The ESR will be enrolled in the PhD programme of University Pompeu Fabra, in Barcelona, Spain, and will write their thesis

on a topic related to *"Real-time engine for orchestrating the control plane in RIS-based wireless networks"* (TID-1), under the supervision of Dr. Andra Lutu and Dr. Angel Lozano for the entire duration of their Ph.D. programme. TID-1 will benefit, in addition, of two secondment periods at other partners of the MetaWireless project (namely, CNIT and CNRS).

Further information about the Ph.D. project can be found in the following tables.

Position: TID-1
Title: Real-time engine for orchestrating the control plane in RIS-based wireless networks
Scientific context: Besides radio access components, MetaWireless aims at a system-level simulator that integrates specific modules for learning and orchestrating the control and data planes through data analytics, which are essential to make RIS-based networks an integrated platform for communications, sensing, localization, and computing. To quickly adapt to the environment, this ESR project views each sensing-enabled RIS as a knob that can be dynamically tuned, which however adds complexity and increases network overhead, since RISs are nearly passive with no on-board processing capabilities. A RIS-specific control plane is necessary, which, in contrast to current wireless networks, is not predefined but is learned by a real-time engine without human intervention. This is required because RIS-based networks will be used for a mix of diverse applications (communications, locations, tracking, etc.), which makes it not possible to statically analyze the network and then deploy the change. The network needs to be continuously monitored and learnt through the sensing capabilities of the RISs, in order to make sure that it runs efficiency and that each RIS is properly configured. To realize this vision, the proposed approach is to exploit data analytics and computational learning theory. Since the current Vienna System-Level Simulator does not possess these characteristics, the developed real-time engine that learns the control and data planes will be integrated in it by developing appropriate software.
Objectives: To develop a real-time engine for learning and orchestrating the control and data planes of RIS-based networks.
Expected results: A RIS-based wireless networks platform that integrates communications, sensing and location capabilities.
Acquired knowledge: Novel software orchestration and control techniques suitable for RIS-based wireless networks.
Planned secondment(s): CNIT (Italy), CNRS (France).

Duties & Responsibilities

1. Undertake postgraduate research in support of the agreed doctoral research project.
2. Work closely with the academic supervisors to ensure the compatibility of the individual project with the overall goals of MetaWireless.
3. Present and publish research in both academic and non-academic audiences.
4. Attend and participate to academic and non-academic conferences, events and seminars.
5. Attend and participate to all training events and supervisory meetings.
6. Be seconded to other network partners as necessary to fulfil the grant obligations.
7. Prepare progress reports and similar documents on research for funding bodies, as required.
8. Contribute to the delivery and management of the wider programme, including attending and participating in programme committee meetings.
9. Actively contribute to the public engagement and outreach activities as described in the grant agreement.

As job descriptions cannot be exhaustive, the ESR may be required to undertake other duties, which are broadly in line with the above duties and responsibilities.

Person Specification

1. An undergraduate degree and a postgraduate Master's degree (or equivalent) in electronic or electrical engineering, mathematics, electromagnetics, or a physical sciences subject.
2. Excellent mathematical skills and background.
3. High proficiency in python, R, or similar programming software.
4. Solid background on wireless communications (antennas, propagation, stochastic geometry is a plus).
5. Excellent written and verbal communication, including presentation skills.
6. Highly proficient English language skills.
7. Excellent organisational skills, attention to detail and the ability to meet deadlines.
8. Ability to think logically, create solutions and make informed decisions.
9. Willingness to work collaboratively in a research environment.
10. A strong commitment to his/her own continuous professional development.
11. Willingness to travel and work across Europe.

Eligibility Requirements

All candidates must meet the following requirements to be considered for this post:

a) Early-Stage Researchers (ESRs) shall at the time of recruitment by the host organisation be in the first four years (full-time equivalent research experience) of their research careers and not yet have been awarded a doctoral degree. Full-time equivalent research experience is measured from the date when a researcher obtained the degree which would formally entitle him or her to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the researcher is recruited.

At the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the three years immediately prior to the recruitment date. Compulsory national service and/or short stays such as holidays are not considered.

How to Apply

Applications must be submitted, to the attention of Dr. Andra Lutu, according to the following procedure:
1) Registration and submission of the application material to the MetaWireless recruitment website (https://h2020-msca-itn-metawireless.cnit.it/jobs/).
2) Registration and submission of the application material to the TID recruitment website: https://career5.successfactors.eu/sfcareer/jobreqcareer?jobId=168489&company=Telefonica

Informal enquires for further information about the positions can be send to Dr. Andra Lutu (andra.lutu_at_telefonica.com)

Note 1: Registrations and submissions need to be done to both websites.

Note 2: By registering on either of the two websites mentioned above, the applicants agree that the members of the MetaWireless project can access their personal data and application material.

Each application must include the following material:
a) A cover letter explaining the motivation for applying for the post.
b) A curriculum vitae setting out the educational qualifications as well as any additional scientific achievements and publications.
c) Evidence of English proficiency.
d) Copy of Bachelor's and Master's certificates.
e) Copy of Bachelor's and Master's transcripts.
f) Any additional material useful for the assessment of the candidate (e.g., recommendation letters, research project in agreement with the requirements specified in previous text).

Selection Process

The selection and recruitment processes of the ESRs will be in accordance with the European Charter and Code of Conduct for the Recruitment of Researchers. The recruitment process will be open, transparent, impartial, equitable, and merit-based. There will be no overt/covert discrimination based on race, gender, sexual orientation, religion or belief, disability or age. To this end, the following selection criteria for the recruitment of the ESRs will be considered:

1) Curriculum vitae
2) Academic performance (diplomas, university transcripts, etc.)
3) Research and industrial experience
4) Awards and fellowships
5) Publications and patents
6) Research, leadership, and creativity potential
7) English knowledge
8) Other relevant items based on the specific candidate

The recruitment process will adhere to the guidelines described in the Grant Agreement of the MetaWireless project. At the network's level, the recruitment will be coordinated by the Recruitment Committee of the project in order to guarantee gender- and sector-balance. At Telefonica's level, the recruitment will be coordinated by the host entity (Telefonica Research). More precisely, the recruitment and selection of the ESR will be executed by the Scientist-in-Charge of the MetaWireless project for TID (Dr. Andra Lutu), by the Head of Telefonica Research (Dr. Diego Perino), the Responsible of the Human Resources for TID, and other scientists involved in the projects.

The application deadline for the post is on **15th of December 2021**. Each application will be acknowledged electronically (e.g., by return email) and a unique ID number will be assigned to it. The applications will be analysed after the application deadline, and the shortlisted candidates will be invited to a teleconference interview. The selected candidates are expected to be recruited during the period **15th of January 2021 – 1st of February 2021**. At the end of the selection process, all the applicants will be informed of the outcome of their application by return email. Applicants interested in joining TID are invited to apply to TID-1, and to express their preference for the most suitable post (if any).

Further Information

For more information about the post TID-1, please contact Dr. Andra Lutu (andra.lutu _at_ telefonica.com).

Disclaimer

By applying for this position, the applicants give their consent to circulate their application and personal data within the members of the consortium.

By applying for this position, the applicants declare to fulfil the eligibility requirements defined by the MSCA.

By applying for this position, the applicants agree that they will comply with the secondment plan.

By applying for this position, the applicants agree that they will comply with the planned Ph.D. enrolment.