

CALL 18-2022-1 Pre-Doc Research Position at The Sustainable Artificial Intelligence Research Unit

The recently established Sustainable Artificial Intelligence research unit of CTTC invites applications for an **early-stage researcher (ESR)** at pre-doctoral level. The contract will be funded by EU-MSCA-GREENEDGE project, see <https://greenedge-itn.eu/>. For more information about Sustainable Artificial Intelligence Research Unit [click here](#) and <https://supercom.cttc.es/>

ESR Project title: End-to-end communication/computing resource management for low-latency beyond 5G MEC [GREENEDGE ESR14]

Contact names: Dr. Paolo Dini (paolo.dini@cttc.es) and Dr. Sandra Lagén (sandra.lagen@cttc.es)

Application deadline: June 10, 2022

ESR Project Description: This project focuses on the design of end-to-end wireless network architectures and communication/compute resource management techniques for enabling high-capacity low-latency communications through a cost-effective and energy-efficient use of the wireless spectrum. Within the framework of next generation Open Radio Access Network (O-RAN) architectures, several radio/compute access techniques will be derived, which can be dynamically adjusted to the computation and communication requirements of different latency-critical scenarios (such as Industry 4.0 and vehicular scenarios) through novel mobility, interference, and computing management schemes. The concepts of semantic compression and communication as well as strategies like convex optimization and machine-learning will be considered to optimize the available communication, networking, and computation resources to meet the requirements of future low latency services, while considering the challenging mobility, propagation, and traffic conditions of future scenarios.

Expected Results: Develop new end-to-end wireless network architectures and radio/compute resource management techniques based on theoretical analysis and system-level simulations. Theoretical analysis to assess the achievable gains of the proposed architectures and schemes, along with their fundamental performance limits. Machine-learning-based optimization of network configuration and critical system parameters. System-level simulations to compare theoretical performance limits with practical implementation's performance.

Supervision and Mobility Program: Once hired, the candidate: i) will work at CTTC, performing full-time research under the supervision of Dr. Paolo Dini and Dr. Sandra Lagén. ii) will be enrolled in the PhD program at Universitat Politècnica de Catalunya (UPC), under the supervision of Mario Garcia Lozano. iii) will additionally pursue two secondments at CEA (Grenoble, France) and Nokia Bell Labs (NBL) (Stuttgart, Germany), for a respective duration of 5 months.

What do we offer? :

- **We have great benefits for employees:** conciliation measures (33 business days of vacation, teleworking plan, flexible hours); We complement leaves for temporary disability, tax-free benefits (restaurant ticket, childcare center, commute and medical insurance), continuous training.
- Annual gross salary according to the profile of the candidate
- Full-time contract: 7,5 h/day. Flexibility
- CTTC category: R1 professional category
- The duration of the contract will be 33 months and easily extendable for a total duration of 36 months (3 years)
- Expected starting date between June and July 2022.
- The contract is subject to the rules of EU-MSCA-GREENEDGE Grant Agreement (including salary). You can find the details at: <https://greenedge-itn.eu/phd-hiring-call/>

Qualifications and Experience

- Required: At the time of recruitment, the applicant must not have lived in Spain for more than 12 months in the previous 36 months (3 years).
- Required: No more than 4 years spent in research/work activities after the achievement of the MS degree.
- Preferred: A Master's degree in Telecommunications, Computer Science, Data Science or equivalent.
- Preferred: Knowledge on mobile networks and edge computing.
- Preferred: Very good communication skills in oral and written English.
- Preferred: Ability and motivation to conduct high-quality research, including publishing the results in relevant venues.
- Desired: Knowledge of Optimization Theory (convex and non-convex optimizations) and Machine Learning (reinforcement learning and deep learning) is an advantage.
- Desired: Programming skills (e.g., Python, TensorFlow, Keras, PyTorch, SciKit, NumPy, R) and/or experience with system-level simulations (e.g., ns-3) is an advantage.

Required, means mandatory to pass the eligibility check.

Preferred, means highly welcome and recommended.

Desired, means additional, not strictly needed, but still very much appreciated.

How to apply?

All applications must include:

1. A complete CV, including a list of publications and the contact details of two potential referees
2. BS and MS degree
3. Cover letter stating the motivation and suitability of the candidate.

The application documents must be submitted in pdf format through this online application.

ONLY APPLICATIONS VIA WEB <https://www.cttc.cat/talent/careers/job-openings/> WILL BE TAKE IN CONSIDERATION.

CVs and any other information gathered during this process will be handled confidentially

Who are we?

- The Center Tecnològic de Telecomunicacions de Catalunya (CTTC) is a non-profit **public sector** research institution dedicated to fundamental and applied research activities, focused mainly on technologies related to the physical, data link and network layers of communication systems and Geomatics.
- CTTC has been working towards implementing the points of the [Charter and Code \(C&C\)](#), fulfilling the requirements of the “Human Resources Strategy for Researchers (HRS4R)” (<https://www.cttc.cat/talent/hrs4r/>).
- The CTTC is located in the beautiful [Mediterranean Technological Park of Castelldefels](#), a science park that houses the Polytechnic University of Catalonia, research institutions, innovative companies and startups. The PMT-UPC is located 10 minutes' walk from the beach and the city center of Castelldefels, also close to childcare centers, public schools and the best international schools. It can be reached by car, train (RENFE) and various bus lines.
- We have 2 buildings on campus, with state-of-the-art facilities, comfortable work spaces, meeting rooms, and multipurpose spaces, as well as social spaces.
- The institute has a **multicultural environment** with more than 130 members (scientific, technical and administrative staff) from all over the world.

CTTC offers and promotes a diverse and inclusive environment and welcomes applicants regardless of age, disability, gender, national origin, race, religion, or sexual orientation.

The CTTC seeks to increase the presence of women in those areas where they are underrepresented and therefore explicitly encourages them to stand as candidates.

It is also committed to increasing the number of people with disabilities in its workforce and therefore encourages their applications.