PostDoc Position - Revolutionizing 6G Networks: A Machine Learning-Based Digital Twin for Seamless Teleoperated Driving Experiences

Short description

This Postdoc is proposed in the context of the European project 6GTWIN "Integrating Network Digital Twinning into Future AI-based 6G Systems" accepted in the second Horizon Europe call under the Smart Networks and Services Joint Undertaking (SNS JU) program. More details about the project : https://6g-twin.eu/

This project involves more than ten European partners between academics, industrials and research organisms. It aims to provide a new 6G Network architecture driven by AI-based Digital Twin (DT) models at physical, network and application layers. The DT technology consists in creating a replication of a physical world component based on the simulation of its behaviour and the analysis of data collected from different sources (sensors, recorded history, etc.). The aim of a digital twin is to provide a reliable tool to ensure behaviour prediction, collaboration and decision making for the most complex real-world systems. The first DT models have been proposed in the manufacturing sector. This concept gains popularity in many other domains such as the communication networks where the advent of the 6th generation of mobile networks will encompass new upcoming challenges relevant to RAN (Radio Access Networks) heterogeneity, complex and dynamic topologies and automated management solutions.

In this context, we situate this postdoc, which aims to propose 6G-compliant AI-based Network Digital Twin (NDT) models for the specific case of the "teleoperated driving" application. Teleoperated driving is identified as the pivotal application around which the major experiments of the 6GTWIN project will be conducted.

Job main activities

- Attend project events, including teleconferences, physical meetings, dissemination events, etc.
- Prepare documentation required by the European Commission (EC), such as technical and project management deliverables, mid-term/final reports, etc.
- Collaborate with the internal technical team in the lab, consisting of 1 PhD student and 2 permanent staff members, dedicated to the project.
- Lead a technical activity within the project, such as proposing new AI-based models (including native machine learning, graph-based, or deep learning) primarily for the network and application layers, aligned with the "teleoperated driving" application. In the context of Network Digital Twins (NDTs), AI models should be integrated with simulation frameworks to predict network behavior, facilitate decision-making, reduce human intervention, and minimize the risk of human error.
- Disseminate findings in top-tier networking venues.

Keywords: AI, Machine learning, Digital Twin, Simulation, Knowledge Distillation, Federated Learning, 6G Networks, vehicular networks.

PhD location: This postdc will take place in the premises of DRIVE Lab in Nevers (Bourgogne, France).

Expected starting date: asap and before the end of 2024.

Contacts:

Pr. Sidi-Mohammed Senouci, University of Burgundy, Nevers, France.

Dr. (HDR) Inès El-Korbi, University of Burgundy, Nevers, France.

Expected Profile:

- PhD degree in wireless communications or a closely related field in Electrical and Computer Engineering is required

- Good understanding of Machine Learning theory and techniques

- Fluent in English and good communication skills, team player

- Availability to travel

How to Apply:

Application process (deadline **October 15th, 2024**)

If you are interested: send your CV and motivation letter to as attachments of an email, whose subject will be "Application for PostDoc position at 6GTWIN", which must be addressed to Sidi Mohammed Senouci (sidi-mohammed.senouci@u-bourgogne.fr) and Ines El-Korbi (Ines.El-Korbi@u-bourgogne.fr)

The position offers:

Hands-on training in 5G/6G mobile networks, digital twins and AI models

Exclusive chance to collaborate with European leading partners in the domain

Participate in a dynamic, cooperative, culturally diverse, and English-speaking environment.

Opportunity to publish research findings in top-tier networking venues.