
PhD Position (M/F)

Reference: CS/JH/NKN/0622

Research topics	Named Knowledge Networking in Vehicular Networks
Departement	ComSys
Publication date	07/06/2022
Start date	ASAP
Duration	Duration of the thesis

Description

EURECOM's Communication System Department invites applications for a PhD position (M/F) in the area of Named Knowledge Networking (NKN) in the context of cooperative connected automated mobility (CCAM).

Vehicular networks evolved from exchanging data between vehicles to information generated by vehicles. With the recent popularity and impact of AI mechanisms either to improve vehicular network itself or being used for CCAM directly, vehicular networks need to again evolve to exchange and share knowledge between vehicles. In a previous study, we formulated a conceptual framework for Vehicular Knowledge Networking¹ and focused on vehicular knowledge creation and naming, leading to a first semantic description of AI models.

The objective of this position is to extend this work, focusing this time on networking aspects. The goal is to model and analyze the impact of NKN to locate, store and efficiently retrieve knowledge in vehicular networks. Information-centric mechanisms, such as Named Data Networking (NDN), Named Function Networking (NFN) or Named AI Networking are expected to be key promising mechanisms to be investigated. Distributed storage/caching as well as distributed ledger technologies are also expected to be complementary mechanisms to support NKN.

The work will be carried out in cooperation with an automotive industrial partner, the candidate will have the opportunity to closely interact with it.

Specifically, the focus of this position will be around the topics of: (i) abstraction, modelling and analysis of networking mechanisms to locate and retrieve knowledge, (ii) methodology for optimal knowledge storage according to its context, (iii) investigate pertinent solutions to secure the creation, exchange and sharing of knowledge.

Finally, this thesis has also an experimental aspect. First, the evaluation of NKN will be conducted on simulators adapted to CCAM. As function of the pertinence, NKN integration in a 5G architecture could be envisioned and evaluated on the EURECOM experimental 5G platforms OpenAirInterface.

Requirements

- Education Level / Degree : Master-level degree or equivalent
- Field / specialty: Computer Science , Electrical or Telecommunication Engineering
- Technologies: A very good background in Wireless and/or Wired Networks (IP, 5G). Very good analytical skills is highly appreciated. Knowledge in AI as well as semantics is appreciated.
- Languages / systems: Experience in C++ or Python programming. Knowledge in simulators (ns-3, Omnet++) is highly appreciated.
- Other skills / specialties: knowledge in C-ITS or Information-centric networks
- Other important elements: Strong communication skills and keen to operate in a multidisciplinary team. Fluent in English (speaking, writing), French not required.

¹ Duncan Deveaux, "On the networking of knowledge in vehicular networks", PhD Thesis, Sorbonne University, 2021.



Application

The application must include:

- Detailed curriculum,
- Motivation letter of two pages also presenting the perspectives of research and education,
- Name and address of three references.

Applications should be submitted by e-mail to secretariat@eurecom.fr with the reference : **CS/JH/NKN/0622**

Important Dates

Screening will start immediately.

Deadline to apply: ASAP but no later than **June 30th 2022**

About EURECOM

EURECOM is a graduate school and a research center in communication systems located in Sophia Antipolis, a vibrant science park on the French Riviera. EURECOM is ranked among the world's top universities in the QS World University Rankings® 2019, considered one of the world's strongest universities in Computer Science & Information Systems and ranked 551/600 worldwide.

Organized as an Economic Interest Group (kind of consortium), EURECOM brings together in its consortium prestigious universities such as the schools from the Institut Mines Télécom group (Télécom Paris, IMT Atlantique, Télécom SudParis, etc.), Aalto University (Helsinki), Politecnico di Torino, Technische Universität München (TUM), Norwegian University of Science and Technology (NTNU), Chalmers University of Technology (Sweden), Czech Technical University in Prague (CTU), ITMO University (St Petersburg), University of Liège (ULiège) and EDHEC Business School, as well as industry members such as BMW Group, IABG, Orange, SAP, NortonLifeLock and the Principality of Monaco as an institutional member.

EURECOM has developed its expertise around three major fields: Digital Security, Data Science and Communication Systems. EURECOM is particularly active in research in its areas of excellence while also training a large number of doctoral candidates. Its contractual research, in which its industrial members actively participate, is widely recognized in Europe and contributes largely to its budget. It's strong links with various industries has enabled EURECOM, with the Institut Mines Télécom, to obtain the Carnot label, a label granted to research organizations which put partnership research at the heart of their strategy.

All of our positions are open to people with disabilities. EURECOM has a disability referent to accompany, advise and provide support if necessary. EURECOM, as part of its gender equality plan, encourages female applications for positions in IT/new technologies, traditionally occupied by men. EURECOM carries out positive actions within the framework of its CSR policy.