Research Engineering Position (M/F)
(Reference: CS_JH_ENG_5G_V2X_070119)

Research topics
LTE/5G-V2X Prototype/Emulation architecture on OpenAirInterface SDR Platform.

Department
Communication Systems

Publication date
01/07/2019

Start date
ASAP

Duration
Fixed Term Contract 18 months

Description
EURECOM’s Communication System Department invites applications for a full-time, 18-month research engineering position (M/F) to work on an LTE/5G-V2X prototype in the context of Connected Automated Trains and Rolling Stocks.

Future rail and rolling stocks will integrate 5G technologies for partial replacements of Train Backbone network (TBN) or Consist Network (ECN). The LTE/5G-V2X technology is of particular interest as enabler for future consists virtual coupling or train platooning, and 5G slicing concepts will allow strict resource sharing between various critical and non-critical rolling stock services. With the completion of the LTE-V2X standard, the Rail industry is eager to develop and test operational prototypes.

The objective of this position is to work on the 5G platform OpenAirInterface (http://openairinterface.org/) and extend the LTE-V2X architecture toward full hybrid prototype & emulator: completing the LTE-V2X networking architecture and completing the emulation architecture by integrating mobility and channel and traffic abstractions. This would lead to prototype tests, contribution to standards and publications. The topic will also evolve toward 5G-V2X, by adding new functionalities New Radio (NR) and Time Sensitive Networks (TSN).

This work will be carried out in the context of a large EU-wide rail project called Safe4RAIL 2 (https://safe4rail2.eu), including all European leading train industry, the candidate will have occasions to interact with them. This work will also be conducted in close cooperation with 3GPP.

Specifically, the focus of this position will be primarily to: (i) integrate and analyse the LTE-V2X mode 3 and 4 scheduler on OAI, (ii) develop a methodology for abstracting the access/channel layers and emulate LTE/5G-V2X communications on OAI, notably supporting mobility traces from SUMO, (iii) adapt of the ETSI C-ITS stack and ITS messages into OAI.

EURECOM is an English-speaking school that enjoys a special status within the group of French Ivy League schools, or “Grandes Ecoles”, as it is the only engineering school in France with a full English language curriculum. Besides teaching at the MSc and PhD levels, EURECOM’s activities mainly revolve around research in the domains of networking, computer security, data-science and mobile communications. It has some 150 employees, including 125 scientists.

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 (WLAN, LTE/5G, Internet). Knowledge in C-ITS technologies, V2X (LTE/ITS-G5) communication and networks is highly appreciated.

Languages / systems: Good experience in C or C++ programming is required. Knowledge in simulators (ns-3, Omnet++) is highly appreciated.

Other skills / specialties: ITS standard knowledge

Other important elements: Strong communication skills and keen to operate in a multidisciplinary team. Fluent in English (speaking, writing), French not required.
Application

The application must include (I, II and III):

- I-Curriculum Vitae
- II-Motivation letter of two pages also presenting the perspectives of research and education
- III-Names and addresses of three references

Applications should be submitted by e-mail to secretariat@eurecom.fr with the reference: CS_JH_ENG_5G_V2X_070119

Postal address

CS 50193 - 06904 Sophia Antipolis, France

Contact

secretariat@eurecom.fr

Fax number

+33 4 93 00 82 00

EURECOM is specifically encouraged to apply with a view towards increasing the proportion of female researchers.

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EURECOM is a French graduate school and a research center in digital sciences based in the international science park of Sophia Antipolis, which brings together renowned universities such as Télécom ParisTech, Aalto University (Helsinki), Politecnico di Torino, Technische Universität München (TUM), Norwegian University of Science and Technology (NTNU), Chalmers University (Sweden) and Czech Technical University in Prague (CTU). The Principality of Monaco is a new institutional member. The Institut Mines-Télécom is EURECOM's founding member.

EURECOM benefits from a strong interaction with the industry through its specific administrative structure: Economic Interest Group (kind of consortium), which brings together international companies such as: Orange, BMW Group Research & Technology, Symantec, Monaco Telecom, SAP, IABG.

EURECOM deploys 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 is recognized across Europe and contributes largely to its budget.

Thanks to its strong ties set up with the industry, EURECOM was awarded the “Institut Carnot” label jointly with the Institut Telecom right from 2006. The Carnot Label was designed to develop and professionalize cooperative research. It encourages the realization of research projects in public research centers that work together with socioeconomic actors, especially companies.