2018-00409 - [Campagne Post-Doctorant 2018/CRI LILLE] - Communication paradigm based on Terahertz band (M/F)

Contract type: Public service fixed-term contract  
Level of qualifications required: PhD or equivalent  
Fonction: Post-Doctoral Research Visit

About the research centre or Inria department

The Inria Lille - Nord Europe Research Centre was founded in 2008 and employs a staff of 360, including 300 scientists working in sixteen research teams. Recognised for its outstanding contribution the socio-economic development of the Nord - Pas-de-Calais Region, the Inria Lille - Nord Europe Research Centre undertakes research in the field of computer science in collaboration with a range of academic, institutional and industrial partners.

The strategy of the Centre is to develop an internationally renowned centre of excellence with a significant impact on the City of Lille and its surrounding area. It works to achieve this by pursuing a range of ambitious research projects in such fields of computer science as the intelligence of data and adaptive software systems. Building on the synergies between research and industry, Inria is a major contributor to skills and technology transfer in the field of computer science.

Context

Main Objective

The main challenge we wish to tackle on this topic, is the investigation of the specific features of data transmission in this portion of the spectrum and the exploitation of these characteristics to achieve very high data rate transmissions by ensuring then coexistence and interoperability with the existing communication technologies (e.g. WiFi).

Assignment

Missions:

The recruited person will join the FUN Team at Inria Lille. The mission of the group is to work on Future Ubiquitous Networks. A way to pursue the ubiquitousness of systems, is to be able to exploit different portions of the frequency spectrum in order to improve the connectivity and rate of the networked system. Among the most important requirements for the Future Beyond the Fifth Generation (5G) mobile networks offer very high throughput per device, the capability to handle a huge amount of data with a low delay, in a heterogeneous context (i.e. connected heterogeneous devices) with different resource capabilities, equipped or not with mobility [1], [2], [3]. This topic is traversal and pertinent to several projects, both national and international that are being developed at FUN Team. Moreover, this is a very hot topic, which is attracting attention from the scientific community, industry, etc.

Job offer description

Since “traditional” MAC and routing approaches suitable for lower frequencies cannot be directly reused in the THz context, the research will mostly focus on the design of new Data Link Layer implementations. In particular, it has been shown that the THz waves are strongly sensitive to the distance changes, which requires highly adaptive MAC protocols in order to achieve high data rate. Furthermore, opportunistic error correction techniques could be applied by taking into account the specific transmission environment. The solutions developed will be implemented through network simulation tools and possible proof-of-concept based on real test bed will be developed.

Main activities

Main Activities:

1) Deeply review of the state of art concerning TeraHertz communication techniques;
2) Identification of the main features of TeraHertz waves and exploitation of these characteristics in a communication context;
3) Design of new adaptive Data Link Layer protocols;
4) Interoperability with other communication technologies (e.g. WiFi, Bluetooth, VLC)

Skills

Technical skills and required level:

The ideal candidate should hold a recently obtained PhD in computer science or more generally a field closely related to the subject of this post-doc (wireless networking, MAC). During his/her PhD, the candidate has published original research in top conferences or journals in the field of Signal Processing, Terahertz Band and MAC layer for wireless networks.

Ideally the candidate should have a good level of programming experience with Electromagnetic Tools, C/C++, Matlab. A strong theoric background in mathematics and physic is required.

Languages: English

Social Skills:

- Sense of organization, autonomy, rigor
- Listening and communicating with non-technical contacts
- Teamwork taste

Additional skills appreciated:

- Multidisciplinary approach

Benefits package

Benefits

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Sports facilities
- Flexible working hours

More information about Lille:

http://www.lille3000.eu/portail/
http://www.lillemetropole.fr/mel.html

Remuneration

Remunerating

The gross monthly salary is 2653€