

Internship proposal M/F (6 months)

Waveform Evaluation for Millimeter Wave Communications

(CCI012019)

Supervisor

Mitsubishi Electric R&D Centre Europe:

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Overall context

5G networks, expected to be commercially launched in 2020, will bring a new generation of faster and more reliable mobile connectivity and will act as a real booster for vertical markets such as automotive, transportation, factory automation and many more. In this context, Mitsubishi Electric R&D Centre Europe is involved in the design of the next generation radio systems, being an active member in the 3GPP standardization activities for the development of the 5G radio access technology, also named New Radio (NR). 3GPP NR Rel.15 standard currently defines a physical layer interface to be used for carrier frequencies up to 52.6GHz.

Internship subject

Millimeter wave communication is one of the key enablers of 5G technologies due to the availability of large amounts of spectrum allowing the use of very large channel bandwidths. A key challenge is that, at very high carrier frequencies, transmission must cope with harsh propagation conditions and severe hardware impairments. For these reasons, the waveform design is a fundamental issue. The purpose of the internship is to evaluate different waveform designs suitable for mmWave communications at very high frequencies, potentially above 52.6GHz.

Detailed objectives

- Bibliographical survey of 5G waveforms for mmWave communications
- Study and comprehension of current 5G NR technologies for mmWave communications
- Design of a link level simulation environment for comparing different waveforms, potentially integrating building blocks from pre-existing NR simulators
- Link level evaluations, analysis of obtained results by taking into account performance, implementation complexity, practical constraints
- Reporting of the obtained results

Prerequisites

- Solid knowledge in digital communications and signal processing
- Interest in research work
- Previous experience with Matlab
- Autonomy
- English: written and spoken

Duration: 6 months

Period: From beginning of 2019 (depending on the school)

Contact: Magali BRANCHEREAU (jobs@fr.mercede.mee.com)

Please provide an application letter and your CV mentioning the reference of the internship (both in Pdf versions).

The signature of an Internship Agreement with your school is mandatory.