MASTER IN PHOTONICS – PHOTONICS BCN
EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: April - > 6 months

Laboratory: Nokia Bell Labs campus
Institution: Paris-Saclay Nokia Bell Labs campus
City, Country : Nozay (91620), France

Title of the master thesis: **Nokia Bell Labs internship in statistical inference applied to ultra-high speed fiber optic communications**

Name of the master thesis supervisor: Director @ Nokia Bell Labs + Jose A Lazaro (UPC)
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Summary of the subject (maximum 1 page) :

Company

Bell Labs is the research arm of Nokia. It employs worldwide around 1000 researchers who investigate breakthrough solutions in telecommunications networks (wireless, optical, fixed) and related areas (computation, algorithms, electronics, machine learning, cloud computing…).

Project

The internship will take place in Paris-Saclay Nokia Bell Labs campus under the ION Lab (IP and Optical Networks Laboratory). The ION lab has developed over the years innovative solutions in fiber optic communications that contributed to product portfolio of Nokia (former Alcatel-Lucent). The ION lab is the world-leading research group in fiber optical communications and is home of several recent breakthroughs such as: coherent detection with signal processing for 100 Gb/s transmission, spatial mode multiplexing, etc.

Currently, one of the investigated topics is the increase of bitrate per channel (towards 1 Tb/s) as well as increasing the spectral efficiency of fiber optic systems. This can be achieved by the combination of optical system careful design, high-speed electronics and state-of-the-art algorithms for signal detection. The internship relates to the latter subject (algorithms) and a successful intern will apply varied techniques from fields such as:

- Communication theory
- Information theory
- Signal processing
- Statistics and probabilistic graphical models/factor graphs
- Machine learning

During the internship the student will perform simulations and algorithm implementation (Matlab or Python), apply these algorithms on experimental data, and eventually carry laboratory experiments. If significant results are obtained, the student is encouraged and supported by Bell Labs researchers or publish his work in leading conferences of optical communications. We have regularly PhD positions that are normally filled by former interns.

Inici: To be specified

Durada: 6 months

Requisits

- Willing to learn in a fast-paced environment.
- Knowledge in 2 or more of the subjects listed above.
- Comfortable with programming.

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Compensació A compensation will be given by the company.

Keywords : Electrical Engineering / Optics & Photonics / Physics, Matlab, Optical Fibers