MASTER IN PHOTONICS – PHOTONICS BCN
EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: April - > 6 - 8 months

Laboratory: Optical Communications Group - Institute of Communications and Navigation
Institution: German Aerospace Center (DLR)
City, Country : Oberpfaffenhofen, D-82234 Wessling

Title of the master thesis: **Development of a highly sensitive optical receiver based on a large area PIN-diode detector for a data rate up to 1Mbps**

Name of the master thesis supervisor: Director @ German Aerospace Center (DLR) + Jose A Lazaro (UPC)
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Summary of the subject (maximum 1 page) :

Subject: The optical communication groups of DLR's Institute of Communications and Navigation develops experimental laser communication systems for optical data links between airborne carriers such as airplanes or satellites and optical ground stations. To achieve a reliable data reception also under difficult atmospheric situations, optical sensors with a large area (diameter ≈ 1mm) should be used. The link distances of the systems are typically in the range of several 10 to hundreds of km and the receivers have to operate with very low input power. Hence, optical detectors and electrical circuits have to be highly sensitive. The amplifier circuits have to provide a high gain bandwidth product combined with a very low noise.

Tasks:
This thesis includes the development of the analog and mixed signal circuits for the described optical receiver. Furthermore it includes:
- Circuit analysis based on SPICE.
- Circuit design with Altium Designer.

- Layout development and assembly.
- Lab verification, optimization and test.

Research center: The German Aerospace Center (DLR) is Germany´s national research center for aeronautics and space and Germany´s space agency. Its extensive research and development work in Aeronautics, Space, Transportation and Energy is integrated into national and international cooperative ventures. Approximately 5,500 people are employed in DLR´s 28 institutes and facilities at eight locations in Germany.

Inici: To be specified (Offer valid till: 28.02.2017)

Durada: 6 - 8 months

Requisits
- Study direction of electrical engineering.
- Profound knowledge in analog/mixed signal circuit theory.
- Hands-on experience in amplifier design.
- Experience in circuit and layout development.
- Experience with Spice.
- Experience with measurement systems.
- Experience with Altium Designer preferred.
- Interest in free space optics.

Compensació A compensation will be given by the company.

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