PHOTONICS - EUROPHOTONICS MASTER COURSE

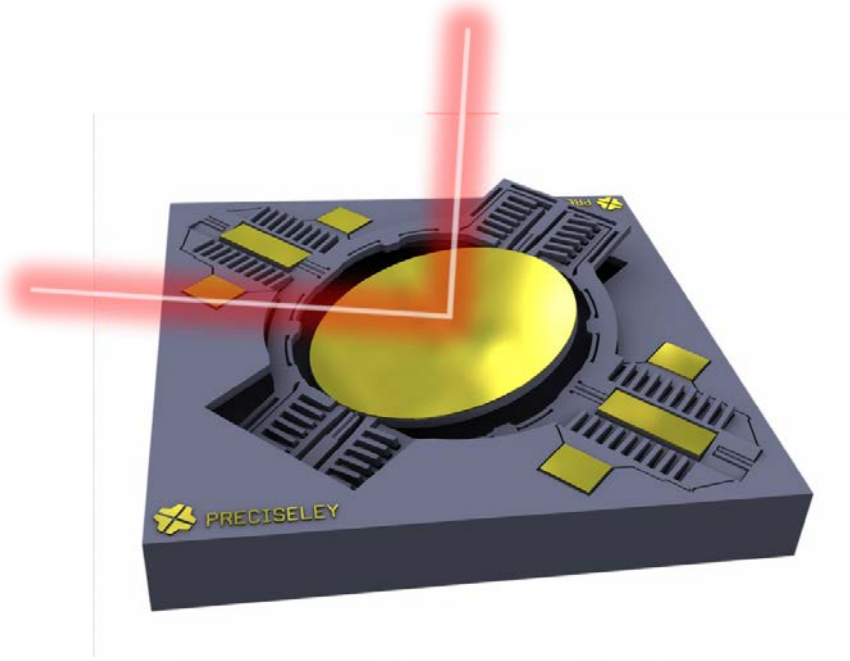
PROPOSAL FOR A MASTER THESIS

Dates : April 1st, 2019 – September 31st, 2019

Laboratory : Centre for Sensors, Instrumentation and systems Development (UPC-CD6)
City, Country : Terrassa, Spain

Title of the master thesis :

Characterization of a MEMS mirror for lidar imaging



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Summary of the subject (maximum 1 page):

Lidar imaging is a powerful measurement technique where a laser pulse is shone onto an object and the beam reflected back is recovered at some solid-state detector. The time elapsed is counted so an automated measurement of the distance to the target is obtained, without any further calculation. The concept is also referred to as ladar or time of-flight imaging.

Lidar imagers scan the image using MEMS mirrors, which provide large deflection angles using different types of arrangements. However, due to their different constructive schemes, their repeatability and performance needs be checked one by one.

The student in charge of this work will design a Labview algorithm for driving the micromirror, and design and implement a number of experiments to check key performance parameters such as the linearity, the repeatability, or the deflection angle of the micromirror.

Keywords : lidar, time-of-flight, 3D imaging, MEMS miromirror, optical metrology, optomechanics, optoelectronics

Additional information :

* Amount of the monthly allowance (if it is the case):
To be discussed depending on the value of candidate.

* Required skills :
Interest in application-driven experimental work for solving real-world problems.
Basic concepts in optical metrology and optical engineering
Programming (C++, MatLab) and use of scientific software packages (Zemax, Labview...)
Search of resources, both scientific and technical
Self-motivated, objective-driven, capable of autonomous working within a multidisciplinary team.

* Miscellaneous :
This thesis contents will be considered confidential due to its closeness to market.
International team with several years of experience in the topic proposed.
Multidisciplinary environment with electronics and mechanics workshops, and specialists and technicians in metrology, optics, mechatronics, and electronics.
Possibility of joining the Centre for a PhD/Project Manager career in case of common interest.
Early incorporation welcome.