OPEN PHD POSITION FOR MARIE SKŁODOWSKA-CURIE INNOVATIVE TRAINING NETWORKS (MSCA-ITN) AT CSIC

**MSCA-ITN**

**PROJECT**

ESR2: Design of a light intensity/ToF sensor in CMOS technology and a 2D/3D smart camera

**PhD SUPERVISOR(S)**

Dr. Ricardo Carmona and Dr. Jorge Fernández

**SCIENTIFIC AREA**

Physical science and technology

**HOST INSTITUTION**

Institute of Microelectronics of Seville (IMSE)

**DURATION**

36 months

**FIXED START DATE:**

Application deadline: **March 1, 2018**
Start date: **April 1, 2018**

**PLANNED SECONDMENT(S):**

6-month secondment (internship) at Imasenic (http://www.imasenic.com) located in Barcelona. Imasenic team has a long accumulated experience in designing advanced image sensors.

**EMAIL OF THE PhD SUPERVISOR(S)**

rcarmona@ime-se.cm.csic.es / berni@imse-cn.uch.ces.csic.es

**WEBSITE OF THE ITN-MSCA**

http://www.achieve-itn.eu
We are looking for a motivated early stage researcher in the field of CMOS image sensor design, in particular in CMOS-compatible Single-Photon Avalanche Diodes.

You have a Master of Science (MS) degree in disciplines like Electrical Engineering or Applied Physics, at the start of the PhD and a background in Microelectronics. Candidates with a MS in other disciplines other than but with a strong knowledge of Solid-State Circuit Design and/or Electronic Device Physics may also be considered. You have a strong interest in analog and mixed-signal integrated circuit design, CMOS image sensors, SPADs and time-of-flight sensors as well as a good knowledge of circuit theory and electronic device physics, as well as circuit design skills. In our lab, you will mainly use Cadence Design Framework and hardware description languages like Verilog and Verilog-AMS, TCAD tools as well as MATLAB. The research work will involve studying CMOS-compatible structures to measure time-of-flight, the design of pixels that are able to obtain 2D and 3D information from the scene, the design and test of prototype chips containing these pixels and the collaboration on the design of an embedded vision system based on these sensors. You perform well in a team. You have good or excellent English and scientific writing skills. You combine a strong interest in scientific research with a desire to see your work applied in industry. Due to EC funding rules, only candidates with less than 4 years of research experience can be considered. Candidates must not have carried out their main activity (work studies ...) in Spain for more than 12 months in the past 3 years. CSIC implements gender neutral recruitment and selection procedures. Female candidates are especially encouraged to apply.
**PhD PROJECT**

The PhD student will work at the IMSE research group on Smart Imagers and Vision Chips. This group has long expertise, leading several projects in this area. The new researcher will therefore work in a team with experienced researchers, cooperating with the other students in the ACHIEVE network and participating in the ACHIEVE’s training program.

**Our offer:** You will receive a PhD scholarship according to the general conditions at CSIC. The scholarship includes full social security coverage (net monthly amount starting at ± 1500 EUR/month + 500 EUR/month mobility allowance + (if applicable) family allowance of 200 EUR/month). The contract will be for 3 years and will start in the first quarter of 2018.

**Objectives:** Design of a photo-sensing structure capable of obtaining information about the luminous intensity emitted/reflected by each point of the image and also of the distance from the sensor to the objects in the scene through the estimation of the time-of-flight. A feasible and CMOS-compatible alternative to implement on-chip ToF estimation is the use of single-photon avalanche diodes (SPADs). Using a pulsed light-source, the SPAD is capable to precisely detecting the arrival of the first reflected photon. Compatibility with standard processes permits to integrate active quenching and recharge circuits. Also, time-to-digital converters (TDCs) can be incorporated in-pixel in order to establish the detection instant very accurately.

**HOW TO APPLY**

Please submit your application by email to both Dr. Ricardo Carmona (rcarmona@imse-cnm.csic.es) and Dr. Jorge Fernández (berni@imse-cnm.csic.es). In your email, please include the following: • A brief motivation of your application: what do you consider the best facts in your CV proving your academic excellence in BSc and/or MSc. education? What are your reasons to pursue a PhD? Why would you like to work at IMSE? ... • A detailed CV, describing your earlier experience and studies; • A list of publications (if available); • A transcript of your educational record (list of courses per year, number of obtained credits, obtained marks) if available. It is not mandatory to provide an official document at this stage; • A (rough) indication or estimate of your rank among other students (e.g., top 10% among 35 students in my Master); • If available: 1-3 English language documents describing your previous research (e.g., scientific papers, Master’s Thesis, report on project work, etc.). These documents need not be on the particular topic of the position.