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PhD student in smart, low-power CMOS Image Sensors (CIS)

Job description

For the *Innovative Training Network (ITN) project ACHIEVE - AdvanCed Hardware/Software components for Integrated/Embedded Vision systEms (H2020-MSCA-ITN-2017)* we are looking for a motivated early stage researcher in the field of smart low-power CMOS Image Sensors (CIS) for efficient 3D detection of scenes. The contract will be for a period of 36 months with the aim of obtaining a PhD, which will be granted by the University of Seville. The research fellow will be hosted at IMASENIC Advanced Imaging S.L., Barcelona, Spain, www.imasenic.com. The academic supervision will be at the University of Seville, Spain, in the research group which is also co-located at the Institute of Microelectronics of Seville, a top international institution in the field of CMOS image sensors.

IMASENIC Advanced Imaging S.L. is an innovative startup founded in 2017 on the back of decades of experience in developing leading-edge CMOS image sensors. Smart and low power sensors are needed to cope with the requirements of applications like autonomous driving, robot visions or smart houses, where there is an explosive demand for image sensors. The new sensors have to be able to provide 3D information too, while maintaining a limited data flow. Through its founders, IMASENIC S.L. has a recognized, decades-long experience in designing high- and ultra high-speed sensors, both for conventional imaging and event-driven applications. The new researcher will work in the team, and will receive training from internationally renowned, in-house experts at IMASENIC.

Our offer

You will be employed by IMASENIC on a 3-year contract. The contract includes full social security and will have a net monthly amount starting from 2,000.00 EUR/month + 400 EUR/month of mobility allowance + (if applicable) family allowance of 180 EUR/month.

The contract will start in the first quarter of 2018. You will also enroll the doctoral studies at the University of Seville, and your academic supervisor will be Prof Ricardo Carmona-Galan, a recognized expert in the field of smart image sensors.

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Objectives

CMOS image sensor is an area of high growth, driven by the ever-increasing requirements coming from sectors like automotive, surveillance, traffic management or green housing. Over this backdrop, an exponential growth in the number of devices is predicted and in parallel there is a higher demand to add depth, 3D information to the usual 2D image. Currently specialized architectures exist to provide depth information, the so-called time-of-flight sensors. The aim of this research project is to investigate and develop new architectures to provide accurate 2D and 3D information in a data-efficient way, and within limited power resources. The recent progress in ultra-high-speed sensors and photon-counting architectures will provide the framework for this research. The first goal is to implement a high-level description of the desired functions and evaluate enabling architectures, both at pixel and sensor level. The second goal would then be the design of the selected pixel, using both TCAD and CAD/EDA modelling. The third objective of this project will be the design of the other blocks in the data path: the A/D converter, digital processing blocks, implementing further feature extraction and data reduction. The fourth and final goal of this project is the definition of the overall sensor architecture, its implementation in a sensor and the characterisation of this latter after fabrication.

Profile of the candidate

You have a Master of Electronic Engineering (at the start of the PhD). Candidates with an MsC in another discipline, e.g. Physics, but with a strong knowledge of mathematics, electronics, semiconductor physics and signal/image processing may also be considered.

You have a strong interest in image sensors and microelectronics, a good knowledge of electronics, semiconductor physics, mathematics, signal or image processing, and basic programming skills. Knowledge and some basic experience with CAD/EDA or TCAD tools is desirable. The research work will involve developing new microelectronics architectures for CMOS image sensors, designing them with state-of-art design software and characterizing the manufactured sensor.

You function well in a team. You have good or excellent English and scientific writing skills. You combine a strong interest in engineering research with a desire to see your work applied in industry. Due to EU funding rules, only candidates with less than 4 years of research experience can be considered.

Candidates may not have carried out their main activity (work, studies, etc) in Spain for more than 12 months in the past 3 years. IMASENIC S.L. implements gender neutral recruitment and selection procedures. Female candidates are especially encouraged to apply.

How to apply

Please submit your application to **info@imasenic.com**

In your email, please include the following:

- A brief motivation of your application: what do you consider the best facts in your CV which demonstrate your academic excellence in BsC and/or Msc. education? What are your reasons to pursue a PhD. Why would you like to work at IMASENIC? ...
- 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. This need not be 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 earlier research (e.g., scientific papers, master thesis, report on project work, etc.). These documents need not be on the topic of the positions.