Position Offered: POSTDOCTORAL RESEARCHER

Project: *Micromachining, Additive Manufacturing and Advanced Encapsulation Techniques for Neuromorphic Sensing and Massive High-Performance Computing Ultra-Low Power Edge Systems with CMOS Nanotechnologies*

Technological and scientific fields: AI, massive data processing technologies, edge computing, additive manufacturing, nanotechnology, sensors.

Location: Sevilla, Andalucía, IMSE-CNM, <u>www.imse-cnm.csic.es</u>

Research Group/PI: Neuromorphic group, Bernabé Linares-Barranco, <u>www.imse-</u> <u>cnm.csic.es/neuromorphs</u>

PROJECT SUMMARY

The Project is enclosed in the research line of Neuromorphic Systems at IMSE (www.imsecnm.csic.es/neuromorphs). With over 30 years of activity, over 15 EU projects portfolio, two successful spin-offs (www.prophesee.ai, www.graimatterlabs.ai), it develops microchips and edge-computing hardware for bio-inspired event-driven vision sensing, computing, and learning systems. The focus is in vision sensing chips exploiting neuromorphic principles on nanometerscale CMOS, and low-power computing chips, including emerging nanotechnology memristive synaptic devices. The research line is highly interdisciplinary, covering from vision sensing, nanoscale memristor based computing and learning hardware, computational neuromorphic algorithms, and applications to high-speed and low-power environments.

On the other hand, IMSE is receiving 9 million € funds to start setting up a new cleanroom facility for advanced encapsulation, micro-printing, and additive manufacturing. The project is intended to combine the neuromorphic microchip design experience with the new cleanroom facilities to enhance and exploit new technological and research capabilites at IMSE, applied to artificial intelligence, sensing, high-efficient edge computing and massive data processing of neuromorphic systems. The specific objectives include: (1) training on 3D additive manufacturing (microlense, light/infarerred/microwave sensors, learning devices connected to an underneath CMOS chip); (2) training on CMOS nanoscale circuit design technologies; (3) training on nanotechnology synaptic computing devices (HfOx, perovskite, or nanopore liquid-ionic-based memristors); (4) training on neuromorphic computational architectures; (5) training on vision sensor chip design.

PROFESSIONAL PROFILE

Minimum requirements:

(1) BSc, MSc, and PhD in Electronics related subjects, (2) experience in analog or mixed-signal circuit design, (3) proficiency in English

Merits to be considered:

Experience in digital circuit design, additive manufacturing, advanced encapsulation, clean room

WHAT IS OFFERED

Training on the subjects described above in "PROJECT SUMMARY", usage of lab facilities at IMSE (see www.imse-cnm.csic.es) including the new cleanroom for advanced packaging and additive manufacturing currently being set up, and participation in EU projects with collaboration of top-level European research labs. Also, a number of research stays are considered, in labs experienced in additive manufacturing, memristor fabrication, and circuit design.

Contract conditions:

Indefinite contract for a Postdoctoral Researcher associated to the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary ($41.000 \in -52.000 \in$).

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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