

Institute of Microelectronics of Barcelona IMB-CNM CSIC

The **IMB-CNM** is the largest institute in Spain dedicated to the research and development of Micro and Nano Technologies and Microsystems and with unique capabilities in silicon technology. It belongs to CSIC since its foundation in 1985 and is distinguished as a María de Maeztu Unit of Excellence.

IMB-CNM aims to contribute to the advancement of knowledge and to the economic and social development of society, as well as to the training of researchers and engineers and to the advice to public and private entities.

The research activities of IMB-CNM are dedicated to Micro/Nano Integrated Systems: miniaturized electronic systems which include sensing and/or actuating capabilities in addition to electronic information processing, power management and external interfaces.

The IMB-CNM is located on the Autonomous University of Barcelona (UAB) Campus and contains the largest clean room facilities in Spain with full capability to process its own CMOS technologies and laboratories.

Project Type: TFG/TFM

Project Title: Development of a test environment for a Pulpino RISC-V System on chip controlling an ISFET sensor array

Research Group: Integrated Circuits and Systems Group (ICAS)

Project Description:

- ❖ The ICAS group has developed an ASIC based on the Pulpino platform for use in the SmartLoC project, which requires a suitable environment for verification and operational purposes.
- ❖ The embedded core controls and manages the readout of a matrix of ISFET sensors.
- ❖ Due to the final application, the number of pads is limited, so a bespoke boot system must be developed to download the application to the SoC.
- ❖ Initially, the system will be replicated in an FPGA for development purposes.
- ❖ Once the GCC toolchain has been properly set up and the download software verified, a full test of the SmartLoC Pulpino will be conducted.

Work Plan:

- Study and understand the RISC-V ISA RV32I.
- Migrate the ASIC design to an FPGA development board.
- Set up of GCC toolchain and development of the host software test using the FPGA.
- Test of the Smartloc Pulpino ASIC.
- Write the TFG/TFM related documentation and presentation.

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Candidate desired studies:

- ✓ BSc Telecommunications Electronic Engineering
- ✓ MSc Semiconductor Engineering and Microelectronic Design
- ✓ MSc Research and Innovation in Computer based Science and Engineering
- ✓ MSc Telecommunications Engineering

Application Process:

Before applying, please **check with your TFG/TFM program supervisor**, as he/she may already be coordinating with us to assign the project.

If there is no such coordination, **complete this [form](#) and send your CV and a motivation letter to Talent@imb-cnm.csic.es, with the subject: “TFG/TFM at IMB-CNM”**

Your CV will be forwarded to the Researcher leading the project who will contact you directly if interested.

Check our website for more information about the IMB-CNM and our research activities

<https://www.imb-cnm.csic.es/en>

Take the next step in your research career with us!

*By applying, you accept our [data protection policy](#).

**IMB-CNM (CSIC) adheres to the [European Charter and Code of Conduct for Researchers](#), ensuring full alignment with their principles and requirements, including equal opportunity, transparency, merit and ability, caring for an open, fair, and excellence-based hiring processes.

IMB-CNM holds the [HR Excellence in Research award](#), which acknowledges CSIC's commitment to continuous improvement in HR strategies for researchers.