



Strengths and Objective

- Micro/Nanotechnology Device Specialist
- Clean-Room IC Manufacturing Relevant Experience

In the field of device engineering focused on micro and nanoelectronics, I seek an opportunity for contributing my international experience and proven modelling, fabrication and characterization skills in a multicultural environment.

Professional Experience

AquaSmart

R&D Engineer: **HARDWARE DEVELOPMENT**

10.2017 – Present

I designed and developed a microfluidic platform integrated with a piezoelectric comb-shaped MEMS for pressure and flow rate sensing. The aim is the realization of a smart-meter for real time monitoring of water networks state.

Main tasks: simulation and design, process flow development, Clean-Room fabrication, physical and electrical tests.

École polytechnique fédérale de Lausanne (EPFL)

Thesis Project: **NON-VOLATILE MEMORY DEVICES**

02.2017 – 08.2017

I validated a proof-of-concept for different HfO_x-based Resistive Random Access Memories (ReRAM) stand-alone prototypes. The electrical properties statistical analysis led to the discovery novel trends associated to the Percolation Theory.

Main tasks: process flow development, Clean-Room fabrication, DC/AC test, statistical data analysis, study of physical mechanisms and relative modification of device structures.

Imperial College London

Engineering Intern: **COMPUTATIONAL NEUROSCIENCE**

06.2016 – 09.2016

In vivo whole-cell recordings in the mouse primary visual cortex via two-photon patch-clamp electrophysiology. I classified and analysed different types of spiking neurons and their action potential characteristics.

Main tasks: patch-clamp electrophysiology, data analysis, comprehension and study of neural networks.

Italian Institute of Technology (IIT)

Engineering Intern: **NEUROMORPHIC DEVICES**

03.2015 – 08.2015

I validated a proof-of-concept for the polymeric switching mechanism of polyimide-based MEMRISTORS integrated with Ag nanoparticles.

Main tasks: device fabrication and characterizations, DC test, modelling of switching mechanisms.

Publications

43rd International Conference on Micro and Nanoengineering (MNE2017), INL, Braga (PT). Poster Presenter: "Cell Area and Buffer Layer Thickness Effects on HfO_x-based ReRAMs", Sub-topic 2.1 Fabrication and integration of MEMS/NEMS and nanodevices.

Education

EPFL – Politecnico di Torino – Grenoble INP

Master of Science in **NANOTECHNOLOGIES FOR ICTS**

10.2015 – 10.2017

- Major in Micro/Nanoelectronics and Integrated Circuit Technology
- Minor in Solid State Physics & Materials Properties at the Nanoscale
- International Exchange Program: Italy - France – Switzerland

Politecnico di Torino

Bachelor of Science in **PHYSICAL ENGINEERING**

09.2012 – 10.2015, Final Grade: **107/110**

- Major in Advanced & Applied Physics, Quantum Mechanics, Physics of Complex Systems
- Minor in Electronics & Electromagnetism, Measures

Technical Skills

Manufacturing IC Techniques

- **PHOTOLITHOGRAPHY:** Optical Lithography, Positive/Negative Resist Coating/Exposure/Development, Mask Layout
- **THIN FILMS:** DC/RF Sputtering, ALD, CVD, PVD
- **ETCHING:** ICP Etching, Wet/Dry Etching, CMP

Physical and Structural Characterization Techniques

- SEM/TEM, AFM, STM, UV/VIS & ATR-IR/FT-IR spectroscopy, TGA

CAD/Computational Software

- COMSOL Multiphysics®, Cadence DFII Virtuoso/Assura®, SPICE, Silvaco ATHENA/ATLAS
- MATLAB®, OriginPro, R, Excel, Microsoft Mathematics, ANSYS

Undergraduate Projects

EDA Based Design

- **FULL-CUSTOM DESIGN:** 8-bits ALU (logic block, adder, multiplexer), PMOS input differential pair based OTA
- **SEMI-CUSTOM DIGITAL DESIGN:** 32-bits MULTIPLIER

CAD Design, Analysis and Simulations

- **MEMS AFM NANOPROBE** based on a ring bulk mode resonator
- **OPTO-ELECTRIC DETECTOR FOR NEURAL ACTIVITY** (liquid crystals)
- **MEMS THERMAL BIOSENSOR** for metabolic monitoring applications

Personal Information

- **NATIONALITY:** Italian
- **LANGUAGES:** fluent written and spoken English, basic French
- **INTERESTS:** traveller and reader, TED talks follower, soccer player
- **MILITARY SERVICE:** Exonerated
- **DRIVING LICENCE:** Type B