



UNIVERSITY: Public University of Navarre (UPNA)

WIT PROGRAMME'S RESEARCH LINE NAME: Development and manufacturing of multi-source energy harvesting systems

DOCTORAL PROGRAMME: Doctorate in Communications Technology, Bioengineering and Renewable Energies:

<https://www.unavarra.es/escuela-doctorado/doctorate-programs/current-plan/engineering-and-architecture/doctorate-in-communications-technology-bioengineering-and-renewable-energies?languageId=1>

COMPLETE DESCRIPTION OF THE LINE

In many wireless networks and IoT applications, the maintenance of the nodes is complex, due to their number and location. For this reason, the energy autonomy of these nodes is very necessary, thus drastically reducing maintenance costs and increasing their availability. Energy harvesting techniques make it possible to achieve such energy autonomy, by capturing residual energy from the environment of the nodes.

Due to the different nature and intermittency of available environmental energy (solar, thermal, mechanical, etc.), hybrid or multi-source capture schemes are currently very popular, using an independent power converter for each transducer. This proposal pursues as an alternative the design and manufacture of MIMO (multiple-input, multiple-output) converters in CMOS technologies, which can adapt the load depending on the transducer, reducing size, cost and power consumption. These new high-efficiency converters present great scientific interest and high industrial demand.



RESEARCH GROUP NAME: COMMUNICATIONS, SIGNALS AND MICROWAVES

COORDINATOR:

- Last and first name; link to the “Portal of scientific production”:
Lopez-Martin, Antonio
(https://academicos.unavarra.es/CawDOS//jsf/seleccionActividades/seleccionActividades.jsf?id_pers=2254&idioma=es&elmeucv=N)
- Department: Electrical, Electronics and Communications Engineering
- Email: antonio.lopez@unavarra.es
- Telephone number: +34 948 169311

MEMBERS OF THE LINE RESEARCH:

- Alfonso Carlosena García
- Carlos A. De la Cruz Blas
- Francisco Falcone Lanas
- Miroslav Zivanovic Jeremic
- Jose M. Algueta Miguel
- Javier Beloso Legarra
- Maite Martincorena Arraiza
- Carlos Castellano Aldave

ANOTHER RESEARCH LINES OF THE GROUP: list of them

- Analysis and simulation of wireless systems
- Ultra low consumption electronics design



- Contextual environments and IoT systems
- Wireless sensor networks
- Design of analog and mixed-signal ASICs
- Analog and digital signal processing
- Numerical methods in antennas, microwaves and radar
- Terahertz and quasi-optical technology
- Metamaterials and plasmonics
- Filters and output multiplexers in waveguides for onboard power applications in satellites
- Design of passive components for microwaves, millimeter waves and Terahertz

▪ Entities involved in research lines and contact person:

✓ Academic entities:

University of Catania (Italy): Salvatore Pennisi

New Mexico State University (EEUU): Jaime Ramirez-Angulo

University of Sevilla (España): Fernando Muñoz Chavero

✓ Industrial entities:

IED Electronics: Iván Latasa Zudaire



- Joint supervision of doctoral thesis with international universities or non academic institutions:

The doctoral thesis can optionally be co-supervised by the following researchers:

University of Catania (Italy): Salvatore Pennisi

New Mexico State University (EEUU): Jaime Ramirez-Angulo

- Brief group overview

The group has been developing cutting-edge research for 25 years and transferring knowledge to companies in different sectors (Seiko Epson, Azkoyen, CASA, ESA, Antolin, Ingeteam, CEBI, Piher, etc). Its trajectory is supported by the recognition of the Spanish AEI as a Group of International Excellence and numerous high-impact publications and patents that place the group as an international reference. It is integrated into the Institute of Smart Cities (ISC) and is made up of two professors, five associate professors, and a senior lecturer, all from the area of Signal Theory and Communications. It also has two postdoctoral researchers and 6 predoctoral students.

The activity focuses on three key areas: design of integrated circuits and very high frequency circuits, signal processing and wireless communications. It maintains an intense international collaboration (Fraunhofer, ETH, ESA, NMSU, etc.) and encourages the mobility of researchers within the framework of these collaborations.

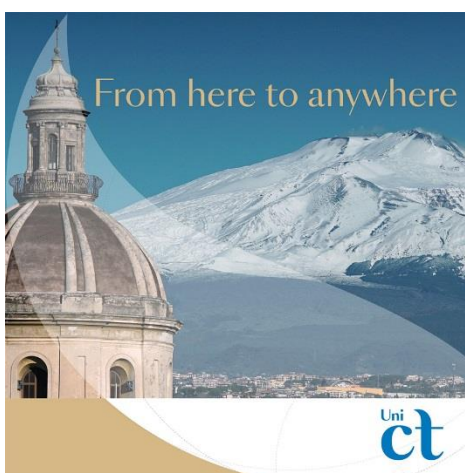
- Link of the group to the “Portal of scientific production”

<https://academicos.unavarra.es/CawDOS/jsf/seleccionGrupos/seleccionGrupos.jsf>

- Pictures, links... to academic or industrial partners (if any)

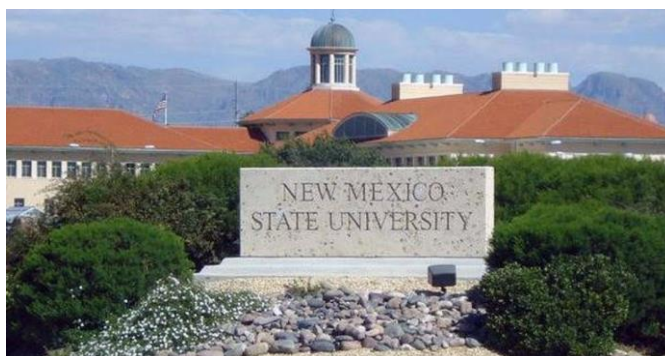
Univeristy of Catania

<https://www.unict.it/en>



New Mexico State University

<https://www.nmsu.edu/>





University of Seville

<https://www.us.es/>



IED Electronics

<http://www.iedelectronics.com/>





REQUIRED QUALIFICATIONS:

- ENGINEERING
- COMPUTER SCIENCE
- PHYSISCS

ADDITIONAL SPECIFIC REQUIREMENTS

- Experience in the design of electronic and communications systems, sensors and instrumentation will be valued