

SATIE

INFORMATION AND ENERGY TECHNOLOGY SYSTEMS AND APPLICATIONS LABORATORY

Laboratoire des systèmes et applications des technologies de l'information et de l'énergie

UMR 8029
CNRS/CY Cergy
Paris Université/ENS
Paris Saclay/CNAM/Université
Paris Saclay/ENS Rennes/Université Gustave Eiffel
100 teacher-researchers
100 doctoral and postdoctoral researchers

SATIE is a joint research unit covering a wide range of electrical engineering topics with the aim of developing cutting-edge technologies in Electrical Engineering (energy management and conversion, signal processing) and Applied Physics (instrumentation, sensors, NDT techniques, bio-microsystems). It has been set up to study components and systems for electrical energy (CSEE group) and to develop multiscale information and analysis systems (SIAME group).

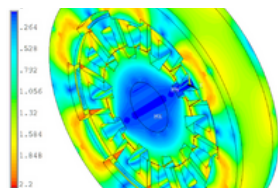


KEYWORDS SCIENCE

- Electronics and power electronics
- Magnetic materials and components
- Instrumentation and signal processing
- Embedded systems
- Multimodal NDT of complex materials
- Imaging
- Data and image analysis

KEYWORDS APPLICATIONS

- Energy
- Electromobility
- Heritage
- Security
- Health / Wellbeing



APPLICATIONS AND INDUSTRIAL SECTORS

- Multimodal non-destructive testing (NDT) for the conservation-restoration of material heritage
- Characterisation of skin properties for cosmetic, health, and wellbeing applications
- Object detection and pattern recognition
- Security, geolocation, radar, sonar, radio communication
- Embedded systems, autonomous and automatic mobility cyber systems in complex environments, autonomous vehicles
- Power electronics, renewable energy production, and electromobility

KNOW-HOW · SKILLS · EXPERTISE · SPECIFIC FEATURES

- Instrumentation and imaging: development of instrumental systems, sensors, measuring and imaging devices for complex media, soft matter, material heritage, and living organisms based on the study of wave-material interactions (optical - laser, acoustic - ultrasound, LF and RF electromagnetic) at different scales
- Methods and tools for complex signals and systems: acquisition, processing and analysis of data and images, methods and tools for multi-sensor instrumentation, design of embedded computing architectures, design of autonomous sub-systems, instrumentation of vehicles and embedded, multi-environment, and multi-use systems
- Electrical energy systems: synthesis and implementation of magnetic and functional materials, components and sub-systems for electrical energy, design and production of integrated power electronic devices optimised with respect to their usage constraints, electromagnetic compatibility of power systems, aging and lifespan of power components and energy conversion systems, design, management, and real-time control of complex electrical systems, optimal design methodology for electromechanical conversion chains

EQUIPMENT

- Non-destructive testing (NDT) of complex materials:
 - Laser systems for imaging and spectroscopy
 - Mechanical / acoustic characterisation systems
 - Ultrasonic micro-rheology systemse
 - LF and RF electromagnetic characterisation system
- Magnetic materials characterisation platform
- Electromagnetic Compatibility (EMC) testing platform
- Testing platform for energy conversion and renewable energies (wind, solar, wave swell)
- Electric actuators

PATENTS · SOFTWARE

- 7 active patents**
- Piezoelectric sensor, biosensor, energy distribution, electromagnetic characterisation, voltage bus, electromagnetic resonators, etc.

INDUSTRIAL PARTNERSHIPS - SPIN-OFFS

- Around 5 collaborations per year**
- SOMFY, SAUREA, CETIM, WATT & WELL, cosmetics, automotive, and aviation manufacturers, etc.

