

University of Alcalá

University of Alcalá (UAH) traces its origin to the "General Study" (Studium Generale) created in 1293, and it was re-founded in 1977. The historic site of the UAH was declared a World Heritage Site by UNESCO in 1998. The UAH holds the annual presentation of the highly prestigious Cervantes Prize. It is located in Alcalá de Henares, a city 35 km (22 miles) northeast of Madrid in Spain.

- 30,000 students (5,400 international students), 2,100 university teaching staff and researchers and 8 students per teacher.
- 36 undergraduate degree programs and 100 PhD and Master's degree programs.
- 16 libraries with the EFQM 400+ European Seal of Excellence.
- 150 research teams, 11 MEuros in R&D&i projects, 3 Research Institutes and 6 associated University Hospitals and leading biomedical research centres.
- QS Top 50 under 50 University Ranking (2016) and Five Stars in QS Stars University Ranking (2017). Times Higher Education 150 under 50 Ranking (2016).



Polytechnic Centre Department of Electronics



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Universidad
de Alcalá

Group of Electronic
Engineering Applied to
Renewable Energy
Systems

GEISER Research Group

The GEISER research group actively participates in a large number of research projects related to power electronics funded by European public institutions and private companies.

Faculty members of the GEISER Research Group direct MSc and PhD theses whose graduates procure high skilled employment in industry and academia, increasing opportunities for collaboration.

As a result of this intense research work, the GEISER research group generates an important technology transfer to companies and articles for high-impact journals and top-tier conferences.

Research Areas

- Renewable energy: Solar and Wind.
- Full in-house design of Power Electronics Converters.
- Grid integration of power converters: L-filter and LCL-filter design, PLL, Grid code compliance...
- Power quality: Active Power Filters, STATCOM...
- High Voltage DC Transmission (HVDC): Modular Multilevel Converters (MMC), Multi-terminal connections.
- Motor control for medium and large drives: Cascaded H-bridges, NPC converters...
- Full in-house design of FPGA-DSP based control boards and Implementation of control algorithms.
- Modelling parameter estimation of Electric AC machines.
- EMI compliance.
- Smart grids and Microgrid: communication and control.
- Energy storage: batteries, ultracapacitors, ...

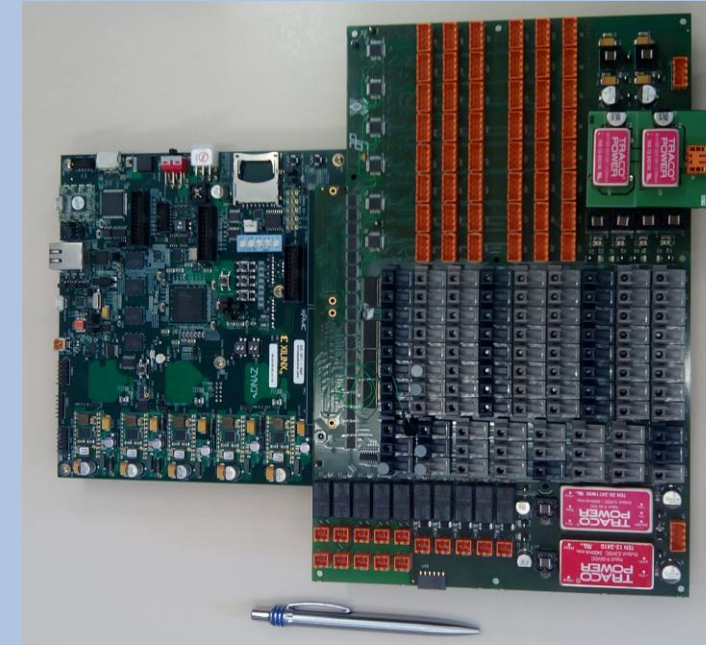


Pic: Prototype of Modular Multilevel Converter (MMC) designed by GEISER

Featured Research Projects

Some of the many research projects GEISER participated in resulted in the following systems:

- CONDOR: 250 kVA Back-to-back NPC converter financed by Spanish Ministry of Science and Technology.
- 50 kVA Modular Multilevel Converter for research on FACTS funded by UAH.
- 50 kVA Fault-tolerant Cascaded H-bridge converter for research on drive applications funded by UAH.
- Communication system and hardware control for a STATCOM funded by Gamesa Enertron.
- FPGA-based control and synchronization of grid-converters converters used in distributed generation Spanish Ministry of Science and Innovation and company Sedecal Control.



Pic: SoC FPGA-based control boards designed by GEISER

Past and Present Industrial Partners

