MSc FINAL PROJECTS BY **PROF PAOLO ARENA**

TOPICS

BIO--ROBOTICS

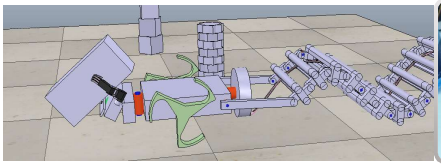
- New bio inspired neuron models for locomotion control
- Implementation of bio-ispired control algorithms in bio-robots via Dynamic simulation environment & 3D printing realization
- Hexapodal / Quadrupedal /hybrid locomotion control
- Bioinspired learning algorithms for biorobot perception and decision making

DIEEI

METHODOLOGY

- Traditional control algorithms
- NN-based control algorithms

(bio-inspired reservoir computing)



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MSc FINAL PROJECTS BY **PROF Bruno Andò**

TOPICS

- Development of embedded multi-sensor platform for Assistive Technology
- Rapid prototyping of sensors by Milling and InkJet Printing Tehcnology
- The use of magnetic fluids in smart sensors

DIEEI

METHODOLOGY

- Customized (embedded)electronics for instrumentation and data acquisition systems
- Algorithms for signal processing and firmware development
- Tools for sensors layout and processing

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2

MSc FINAL PROJECTS BY **PROF Maide Bucolo**

TOPICS

Biological and Chemical Processes in Micro-channels

- Detection and control strategy based on Advanced Image and Signals Processing Methodologies
- Design and Realization of Embedded Micro-Opto-fluidic Systems

Brain-Computer Interface

- Advanced methods for brain signals Analysis and Control of external device

METHODOLOGY

- Software: Matlab, LabView, CAD in SolidWork, DPIV, Ray-Tracing,
- Technology: 3D-Printing, Soft-Lithography
- Microfluidics and Optics Laboratory

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MSc FINAL PROJECTS BY **PROF Riccardo Caponetto**

TOPICS

- Fractional order element realization and characterization
- Fuel cell modelling
- Tuning and autotuning of fractional order PID controller
- Event detection in traffic conflict
- Modelling and forecasting of power consumption

METHODOLOGY

-

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MSc FINAL PROJECTS BY

PROFF Luigi Fortuna and Arturo Buscarino

TOPICS

- Sentiment analysis on social networks (with ENI Italia)
- Fusion Plasma modeling (with ENEA)
- Variational Autoencoders for information compression (with ENI Italia)
- Convolutionary Neural Networks (with ENI Italia)
- Imperfect nonlinear circuits
- Identification of Hall-effect sensors for control
- Model order reduction in distributed systems (ST-Microelectronics)

METHODOLOGY

- Matlab, Labview, Laboratory experiments, DSpace systems

DIEEI

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MSc FINAL PROJECTS BY

PROFF Luigi Fortuna and Arturo Buscarino

TOPICS

- Modelling and Control of Viscoelastic Materials
- Design and Realization of a distribute piezoelectric sensor
- Synchronization and 3D displacement control of linear actuators with and without delay
- Displacement control of 3D- actuators arrays
- Stress Control of linear Electromechanical Systems
- Modelling and Synchronization of KuKa robots

METHODOLOGY

- Matlab, Labview, Laboratory experiments, Kuka systems

DIEEI

KUKA

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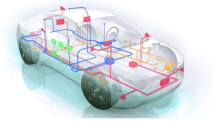
MSc FINAL PROJECTS BY **PROF Lucia Lo Bello**

TOPICS

Industry 4.0 communications and Industrial IoT

- Software-defined management of wireless real-time networks in Industry 4.0 scenarios
- Real-time long range communications for clusters of low power devices in process control applications *
- Performance evaluation of Low Power Wide Area (LPWA) networks for Industrial Internet of Things (IIoT) applications



Automotive communications

- Modeling and simulation of automotive networks
- Algorithms to enable real-time communications for automotive networks.

METHODOLOGY

- Microcontroller programming, MATLAB, OMNeT++ Simulation framework
- C, C++ Programming languages

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MSc FINAL PROJECTS BY **PROF Mattia Frasca**

TOPICS

COMPLEX ADAPTIVE SYSTEMS

- Design and implementation of chaotic oscillators based on single transistors with applications including CMOS circuits and neuron dynamics (w. Dr. L. Minati)
- Dynamical models of failures in power grids
- Identifying the missing links in complex networks and in complex simplicials

METHODOLOGY

- Matlab, Laboratory experiments

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MSc FINAL PROJECTS BY **PROF Giovanni Muscato**

TOPICS

Service Robotics

- Unmanned Aerial Vehicle (UAV) - Unmanned Groud Vehicle (UGV) cooperative control
- Cooperative UAV control for monitoring
- Traversability analysis for field robots
- UAV for agricultural applications
- Robotic walkers for the elderly

METHODOLOGY

- Matlab, Labview, Laboratory prototype development

DIEEI

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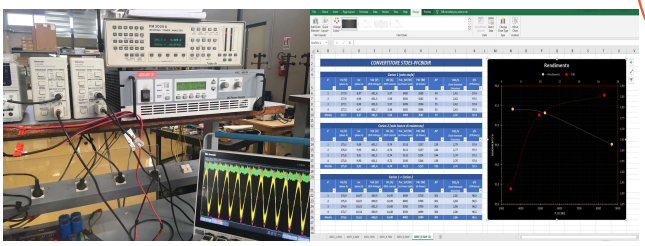
MSc FINAL PROJECTS **PROF Giuseppe Scarcella**

TOPICS

- Power Electronics for Automotive
- Energy efficiency
- HIL - HARDWARE IN THE LOOP **Systems**

METHODOLOGY

- Matlab
- Labview
- Dspace



DIEEI

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MSc FINAL PROJECTS BY **PROF Rosario Sinatra**

TOPICS

- Kinematics and dynamics of mechanical systems, like parallel manipulators
- Dynamics identification of linear systems
- Dynamic performance optimization of mechanical systems
- Study of underwater robot
- Tensegrity structures

METHODOLOGY

- Matlab, Labview

DIEEI

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