

CURRICULUM VITAE

Personal details:

Francesco Damiani

Education:

- ✓ Feb 2000. Degree in Electronic Engineering at Pisa University in Italy.
- ✓ 2002. Training course about 'Innovation Management' at Scuola Superiore Sant'Anna, Pisa ITALY.
- ✓ Languages: Native speaker Italian, English advanced, IELTS 6.5 (R6, L6.5, W6, S7) at Navitas English Sydney NSW Australia, Advanced Certificate at Sydney College of English, Sydney NSW Australia.

Employment:

- ✦ Jun-2018 Now. CEO of Cheros srl. Startup company is involved in research projects on Renewable Energy and high voltage electronics. This company is a research spin-off of Scuola Superiore S.Anna (Pisa). The company is owner of two patents, and collaborates with Scuola Superiore sant'Anna on high voltage electronics and power electronics for multifunctional materials.
- ✦ Mar-2021 Dec2021 Collaboration with Wearable Robotics srl working on electronic design for robotic exoskeleton control and actuation.
- ✦ Dec-2012 Jun-2022. Collaboration with Scuola Scuola Superiore Sant'Anna working on several European projects. In charge of

developing electronic control systems for wave energy conversion and renewable energy devices. Design of Real time control. Hardware In the Loop prototyping (mainly based on Speedgoat and Beckhoff platform). Power electronic design. Experimental equipment design. Robots control electronics development.

- ◆ Oct-2009 Feb-2012. Full time work at Drass Underwater Technology. I was in charge of automation design for diving systems and hyperbaric chambers. <http://www.drass.it/> Automation and control for life support systems. Functional safety norms such as IEC61508. SCADA,HMI.
- ◆ Oct-2002 Oct-2009. Full time collaboration with ARTS (Advanced Robotics Research Center) of Scuola Superiore Sant'Anna in Pontedera (PI) Italy. Electronic designer for research. Electronic solutions for robotics mechatronics and microrobotics research. PCB design, microcontrollers programming. I also published some scientific papers and patent.
- ◆ Jun-2000 Oct-2002. Full time work at ST microelectronics in Agrate Brianza (MI) Italy working as test engineer. ST Microelectronics is the biggest microelectronics producer in Italy. I was involved in microchip automatic testing and production data analysis.
- ◆ Feb-2000 Jun-2000. Full time collaboration at Protecno srl in Pisa (PI) (aka Teslab) Italy as electro-magnetic compatibility and electrical safety consultant.
- ◆ Aug-1999 Feb-2000. Part time collaboration at the electronic lab of Electric Systems and Automation Department at Pisa University as electronic technician. Design and assembly of PCB for motion control of robots.

Skills:

Electronics: More than 20 years in electronics design and technical support to research. Extended experience in high voltage and power electronics design. Large experience on actuation systems for smart materials. Good knowledge of electro-magnetic compatibility and electrical safety EU regulations and norms. Experience in electronic

measurements. Microcontrollers programming. Electronic circuit design, simulation and prototyping. Orcad Cadence, Altium, EasyEDA, Pads. PLC, SCADA. Real time targets. Hardware in the loop. Microelectronic silicon device testing.

Automation and control: experience of automatic control systems design and commissioning. PLC, HMI, SCADA (Siemens, Omron, Beckhoff), Real time targets (cRIO, Speedgoat, ServoToGo, dSpace, UEISIM). Good knowledge on instrumentation and actuators. Functional safety oriented automation (EC61508). Automation products Kollmorgen, LinMot, Faulhaber, Elmo, Maxon. Fieldbus Profinet EtherCat Modbus.

Robotics: Robots control. Autonomous navigation, obstacle avoidance and robots cooperation. Autonomous marine robots. Underwater robotics, Industrial robots, cobots.

Scientific publications:

“A micro flow-meter for closed-loop management of biological samples”
D.Accoto, F.Damiani, M.Campisi, P.Castrataro, D.Campolo, E.Guglielmelli, P.Dario. Engineering in Medicine and Biology Proceedings.

“A soft-lithographed chaotic electrokinetic micromixer for efficient chemical reactions in lab-on-chips” M.Campisi, D.Accoto, F.Damiani, P.Dario.

“A slip sensor for biorobotics applications using a hot wire anemometry approach” D.Accoto, R.Sahai, F.Damiani, D.Campolo, E.Guglielmelli, P.Dario

“A mechatronic toy for measuring infants’ grasping development”
Cecchi, F.; Serio, S.M.; Perego, P.; Mattoli, V.; Damiani, F.; Laschi, C.; Dario, P.

“A thermal slip sensor for biorobotic applications”
D. Accoto, F. Damiani, R. Sahai, D. Campolo, E. Guglielmelli, P. Dario

Patents

FI2006A000185

‘Dispositivo microfluidico per generare elettrocineticamente moti convettivi’
(Microfluidic device for electrokinetic generation of convection)
D.Accoto, M.Campisi, F.Damiani, P.Dario.

102016000130691

'Generatore da moto ondoso basato su un elastomero dielettrico con compensazione di rigidità' Marco Fontana, Luca Daniele, Giacomo Moretti, Rocco Vertechy, Boris Teillant, Miguel Vicente, Antonio Sarmento, David Forehand, David Ingram, Francesco Damiani, Michele Righi.

Deposito n°102022000002075

'Sistema per l'attuazione remota di meccanismi articolati'
M.Bolignari, F.Damiani, M.Fontana

European Projects Collaborations

- WetFeet (<http://www.wetfeet.eu/>) – Project on realization of hardware in the loop for wave energy converter PTO characterization. My role was designing and realizing electronic circuits for the control of the whole system.
- Polywec (<http://www.polywec.org/>) – Project on the realization and study of innovative wave energy converters based on multifunctional materials. My role within the project was as design engineer responsible for the realization of electronic circuits for the characterization of multifunctional materials and for the wave tank testing of the whole system.
- Hydronet (<http://www.hydronet-project.eu/>) – Project on the realization of an autonomous sea water vehicle for environmental analysis. My role within the project was as electronic designer in charge of realizing electronic circuits for robot control and sensor integration.
- TACT (<http://tact.unicampus.it/index.aspx>) – Project on sensorized toys for the study of gesture and grasping for the diagnosis of neural diseases in infants. My role was as electronic designer in charge of realizing electronic circuits for sensors acquisition within smart toys.

- NINIVE (http://cordis.europa.eu/result/rcn/50369_en.html) – Project on nanotechnology applied on in vivo gene therapy. I was in charge of designing and realizing an high voltage amplifier for cell membrane electrophoresis.
- Neurobotics - Project on fusion of neuroscience and robotics. In particular I was in charge of developing micro-fabricated neural interfaces.
- Good-Food – Project on application of sensor network to agriculture. I was in charge of developing electronic circuits for the acquisition of sensor arrays.

Other Projects Collaborations

- Wave Energy Scotland project – Project funded by Scottish agency for wave energy. The aim of the project was of realizing a scaled prototype for wave energy conversion based on multifunctional materials. My role within the project was to realize electronic circuits for control of the whole prototype.
- SUONO (italian project) – Project funded by Italian government. The scope of the project is to realize an innovative interface based on immersive reality for Remote Operated Vehicles (ROV). My role within the project is to realize electronic systems for underwater mechatronic systems.
- Eolo (Regional project) – Project funded by Tuscany Region. The scope of the project is to realize innovative concept prototype of wind energy conversion system based on multifunctional materials. My role within the project was of designing and realizing the whole prototype and to perform experimental testing.

Electronics design projects

- Full custom electronics for robotic exoskeleton control including CPU, full custom servo drive, full custom A/D converter, ethercat communication.

- Servo drive for brushless motor control based on ethercat.
- Analog acquisition board with ethercat capability
- Sensorized insole for robotic exoskeleton control and signal conditioning electronics.
- Robotic electrostatic gripper signal conditioning electronics for grip sensing.
- Driving unit for smart actuators for robotics application based on dielectric elastomers.
- Driving unit for smart actuators for robotics application based on dielectric fluids.
- Measurement unit for smart actuators for robotics application based on dielectric elastomers.
- Signal conditioning interface for real time target interface for control rapid prototyping based on Simulink.
- High voltage amplifier 0 to 10kV.
- Dual active bridge for efficient dielectric elastomers energy harvesting and robots actuation.
- Several high voltage probe for dielectric elastomers measurements up to 20kV.
- Control unit for novel wind turbine prototype based on flapping.
- Control unit for wave energy converter based on dielectric elastomers.
- Miniaturized circuit for acquisition of sensorized mechatronic toy for study of infants grasp.
- High pressure video terminal and camera for underwater application.
- Subsea illumination system.
- Helium voice unscrambler for divers communication.
- High voltage equipment for cell biology experiments.
- Current controller and measurement unit for microfluidics devices testing.
- Smart battery charger for lithium batteries.

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Livorno 01/06/2022

Francesco Damiani