CURRICULUM VITAE

Name

Roberto

Family Name

Rocca

ACADEMIC QUALIFICATIONS

2009 - 2012 Bachelor Degree in Energy Engineering at the University of Rome 'La Sapienza'

Thesis title: *"High Power Applications of Superconductivity"*

Supervisor: Prof. Carlo Cosmelli

The thesis reviews the most relevant high-power applications where superconductivity is used. The review includes the Superconducting Transmission Lines, The Superconducting Magnetic Energy Storage Systems (SMESs) and the Magnetic Levitation Railway Systems (MAGLEV).

2012 - 2015 Master Degree (cum laude) in Electrical Engineering at the University of Rome 'La Sapienza'

Thesis title: *"Optimal Design of a 250kW Switched Reluctance Machine Starter/Generator for the More Electric Aircraft"*

Supervisors: Prof. Fabio Giulii Capponi (University of Rome 'La Sapienza')

Prof. Chris Gerada (University of Nottingham)

The thesis develops the electromagnetic design of a 250kW of a Switched Reluctance Machine operating as starter/generator for short-mid range aircraft (i.e. Boeing 737, AirBus A320). The design is developed by a combination of analytical and Finite Element models.

POSITIONS

2019 – present day Postdoctoral Researcher at 'Sapienza' university of Rome

2015 – 2019 Ph.D. Student at the University of Nottingham

Thesis title: *"Analytical Approach to the Multiphysics Design of Wide-Constant-Power-Speed-Range Switched Reluctance Machines"*

Supervisors: Prof. Michael Galea (University of Nottingham, Ningbo CN)
Prof. Chris Gerada (University of Nottingham)

The thesis aims at developing a novel approach to the multiphysics design of Switched Reluctance Machines for applications requiring a wide constant power speed range. The design method is based on the introduction of an initial analytical stage that allows for reducing the computational power required for the Finite Element stage. The thesis's work comprises of multidisciplinary analytical and Finite Element modelling, along with the development of design algorithms.

Oct. 2017 – Apr. 2018 Visiting Ph.D. Student at the University of Rome 'La Sapienza'

The placement focused on the analytical modelling of Switched Reluctance Machines, as well as the development of the general aspects of the design methodology being developed for the Ph.D. thesis.

Feb. 2015 – Jul. 2015 Visiting M.Sc. Student at the University of Nottingham

The visiting period was aimed at the development of the master thesis.

RESEARCH PROJECTS

2016 - 2017 The SR-FLY project

Funded by OXTO (www.oxtoenergy.com)

Switched Reluctance Flywheel (SRFly) is a feasibility project looking at developing an integrated flywheel energy storage solution. The novel concept lies in having the flywheel, the main energy storage element, being the SR machine's rotor itself.

Roles within the project:

- Analytical and FE electromagnetic, thermal and mechanical design of the SRFly,
- Management of project reports,
- Management of outsourced manufacturing services.

TEACHING EXPERIENCE

Sept. 2017 Lecturer

University of Rome 'La Sapienza'

Course of DYNAMICS OF ELECTRICAL MACHINES AND DRIVES (Area ING-IND/32)

Sept. 2018 Lecturer
University of Rome 'La Sapienza'
Course of DYNAMICS OF ELECTRICAL MACHINES AND DRIVES (Area ING-IND/32)

CO-SUPERVISOR SERVICES

Degree	Period	Thesis Title	Main Supervisor
M.Sc.	Apr. 2018 – July 2018	Design of a Switched Reluctance Motor Drive for Automotive Applications	Dr. Michele Degano

PUBLICATIONS

Journals

[J1] R. Rocca, F. G. Capponi, S. Papadopoulos, G. D. Donato, M. Rashed, and M. Galea, " Optimal Advance Angle for Aided Maximum-Speed-Node Design of Switched Reluctance Machines," in *IEEE Transactions on Energy Conversion.*

Conferences

[C1] R. Rocca, F. G. Capponi, G. D. Donato, M. Rashed, S. Papadopoulos, and M. Galea, "Analytical Approach for the Identification of an Optimal Design Space for Switched Reluctance Machines," in *2018 XIII International Conference on Electrical Machines (ICEM)*, 2018, pp. 569-575.

[C2] R. Rocca, F. G. Capponi, S. Papadopoulos, G. D. Donato, M. Rashed, and M. Galea, " Optimal Advance Angle for Torque Maximisation in High-Speed, Single-Pulse Operated, Switched Reluctance Machines," in *2019 International Electric Machines and Drives Conference (IEMDC).*