

Mechatronics and Control Systems Engineer Marco CAPUTANO

Age: 34 years old

Email: marco.caputano@gmail.com

Living in: Eindhoven (The Netherlands)

Nationality: Italian

Career Objective

My current career objective is to work in challenging projects as a Control Engineer or Modeling and Simulation Engineer.

Skills / Assets

Strong analytical mind, very good skills in maths, physics and informatics.

Capable to analyze, model and control the dynamics of any physical system.

Accurate problem definition, understanding and solving skills.

Experienced in modelling complex systems in MATLAB / Simulink environment.

I enjoy working with others and in an international environment.

Adept in collaborating with other teams (Mechanical, Electronics, Aerodynamics).

I am able to reach compromises and make decisions to achieve the best results.

Professional Experience

ASML: Mechatronics Development Engineer (May 2013 —)

(consultant at Altran, Eindhoven area, The Netherlands)

My tasks involve specification, design, integration and qualification of the close-loop control systems of the mechatronics sub-systems and components of the EUV source for the new generation of the ASML NXE lithographic machines.

The main focus is on micrometer-accuracy positioning of high speed components for adjustments of optical elements of the laser-produced plasma EUV source.

Hispano-Suiza, SAFRAN group: Modeling and Simulation Engineer

(October 2011 — April 2013)

(Consultant at Aeroconseil, Paris area, France)

Development in Matlab / Simulink environment of a multi-physics numerical model of the Ram Air Turbine (air driven electric generator) for the Embraer KC390 military aircraft

- Architectural design of the model
- Physical studies of the system: formal description in terms of differential equations
- Post-processing of: CFD aerodynamic data, CAD inertial and geometrical parameters
- Development of the overall dynamic numerical model in MATLAB / Simulink environment
- Definition of the wind tunnel tests to validate and readjust the model, calibration of the model
- Simulations for the certification of the equipment.

SIMULATIONS for Etras fcs3

In the framework of the development of a new safety standard (FCS3) for ETRAS system, which is the thrust reverser mounted on Airbus A380:

- Analysis of the FRACAs reports (Failure Reporting And Corrective Action System)
- Reproduction in simulation of the scenarios that generated the bugs
- Proposal of amendments (where applicable) to fix the bugs
- Tests on benches, connected to the PC via:
 - dSPACE
 - ARINC 429 bus (rugged PC)
 - serial interface RS 422

Modeling and Simulation Engineer — (May 2011 — September 2011)

Research center “CREATE Consortium”, Naples, Italy

Nuclear plasma modelling in the framework of nuclear fusion research

Development of ad-hoc software in Matlab environment to simulate:

- The dynamic response of plasma current density profile parameters
- 3D halo current patterns

During September 2011 I was on a mission in UK, at CCFE (Culham Centre for Fusion Energy) to validate on MAST (Mega Amp Spherical Tokamak) the models that I had developed and already verified on JET (Joint European Torus).

Mechatronics Control Engineer (intern) — (May 2007 — September 2011)

Teoresi s.r.l., Torino, Italy

Automatic Control System Design in Matlab/Simulink environment

Design and developing of Matlab/Simulink applications for automatic control systems HIL as:

- **Position and Speed control, haptic control** applied to a servomechanism. (haptics can be described as “doing for the sense of touch what computer graphics does for vision”)
- **Robotics applications**

Master Thesis for MSc. In Automatic Control Systems Engineering

Department of Electric and Electrotechnical Engineering, University “Federico II”, Naples, Italy

Thesis title: *“Plasma modelling for disruption mitigation: dynamic response of plasma current density profile parameters and simulation of 3D halo current patterns”*

Topics of the thesis are:

- A proposal for a simplified dynamic model of beta plasma-parameter
- A proposal for a simplified dynamic model of plasma internal inductance.
- Halo current simulation in 3D non axisymmetric geometry

All the work has been developed in **Matlab / Simulink** environment. The simulation results of the proposed models (Topics 1 and 2) have successfully been compared with experimental data in a significant number of **JET** (Joint European Torus) pulses during normal operations.

Two scientific publications have been produced starting from this work (see below for details).

Scientific Publications:

- *“A simplified poloidal beta response model in JET”*
27th Symposium on Fusion Technology (SOFT). 24-28 September 2012 ([link](#))
- *“Integrated procedure for halo current reconstruction in ITER”*
Plasma Science, IEEE Transactions on. Vol. 41, Issue: 1, Pages: 257-262. January 2013 ([link](#))
Originally presented during: 24th Symposium on Fusion Engineering (SOFE), 2011 IEEE/NPSS. 26-30 June 2011

Bachelor Thesis for BSc. In Automatic Control Systems Engineering

Final dissertation title: “A mathematical model of a naval vessel in order to design automatic control systems”

The final work has been developed in cooperation with the department of Marine Engineering of the University “Federico II” of Naples (Italy); it is based on the theories and the software developed by **CESOS** (Centre for Ships and Ocean Structures) of NTNU (Norges Teknisk-Naturvitenskapelige Universitet, Norway).

Topics of the thesis are **mathematical model** of:

- Naval vessel, studied in 4 degrees of freedom (surge, sway, roll, yaw).
- Rudder
- Environmental disturbances: sea waves

Numeric simulations; plots and 3D graphic animations

Toolbox DAMAROB

I'm developing a **Symbolic Robotics Toolbox for Matlab** that evaluates kinematic and dynamic model of a manipulator in symbolic-math matrix form, generates trajectories, has a 3D graphical interface, provides help.

(The Toolbox is available for download at: www.damarob.altervista.org)

Education

MSc. In Automatic Control Systems Engineering

University “Federico II”, Naples, Italy. Degree obtained in 2011

Specializing Master in Mechatronic Systems Design

Polytechnic of Milano, Italy — 1 year course, Degree obtained in 2007

BSc. In Automatic Control Systems Engineering

University “Federico II”, Naples, Italy. Degree obtained in 2006

Languages

Italian: Mother Tongue

English: Fluent

French: Fluent

Spanish: Basic

Certifications / Trainings

July 2014 - “Applied Optics”, DSPE - Dutch Society for Precision Engineering

Technical Skills

Operating systems: Windows and Linux

Applications: Advanced knowledge of **Matlab / Simulink**. (Toolboxes: Control System, Image Acquisition, Image Processing, Symbolic Math, Virtual Reality, Real Time Workshop, Signal Processing, Video and Image Processing)

Basic knowledge of **Dymola, Spice**

Good knowledge of **MS-Office** package

Programming Languages: average knowledge of **C** and **C++** languages

Others

I like traveling and I am passionate about analogical and digital photography.

I hold an European driving license B.

January 2015

Marco CAPUTANO