

ALESSANDRO BORGHI

Automation Engineer

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EDUCATION

Ph.D. Researcher in Applied Mathematics

Berlin Institute of Technology (TU Berlin), Berlin, Germany

📅 Oct. 2021 – Present

MSc in Systems and Control

Delft University of Technology (3mE Department), Delft, Netherlands

📅 Sept. 2019 – Oct. 2021

BSc in Automation Engineering - Score: 89.67/100

Tongji University, Shanghai, China

📅 Sept. 2016 – Jul. 2019

BSc in Automation Engineering - Score: 104/110

University of Bologna, Bologna, Italy

📅 Sept. 2015 – Dec. 2018

High School Diploma in Electronics and Electrical Engineering - Score: 86/100

ITIS E.Fermi, Modena, Italy

📅 Sept. 2010 – Jun. 2015

PROFESSIONAL EXPERIENCE

Business Development Associate

Sparksense, Zurich, Switzerland

📅 October 2020 – March 2021

- Working to help business to business technology startups and bring them an efficient market outreach so to enhance their growth and their product development.

Internship project (R&D)

Beckhoff Automation Co., Ltd., Shanghai, China

📅 March 2019 – July 2019

- The project I was involved in, which was for my second thesis, consisted on the design of an active vibration compensation (for residual vibrations) process using the input shaping technique implemented in TwinCAT.

Exchange student

Tongji University, Shanghai, China

📅 Sept. 2016 – Jul. 2017

- Studied one year systems and control subjects at Tongji University, thanks to an exchange program called AlmaTong project with the University of Bologna in order to receive a double BSc degree in Automation Engineering.

Internship as helper for field test engineers

CNH Industrial, Basildon, Great Britain

📅 Aug. 2014

- Worked for one month as helper for the field test engineers at CNH Industrial in Basildon, England. Experience in vibration control in tractors with old and new shock absorbers.

PROJECTS

PhD Project:

- *Structure-preserving model reduction for the efficient computation of exceptional points in thermoacoustic spectra*

MSc Thesis:

- *Koopman Subspace Identification in the Presence of Measurement Noise*
Computing a matrix approximation of the Koopman operator through a subspace-identification-based data-driven modeling technique robust to measurement noise in the training data.

Temperature Control (Team Project):

- Modeling through subspace-identification methods and a physics-model-based-parameter-regression algorithm of an Arduino based temperature control lab. The control of the temperature was done through the implementation of a LQR, MPC and robust \mathcal{H}_∞ controller.

Second BSc Thesis:

- *Simulation and Implementation of the Input Shaping Technique for a Flexible Transmission System*
Simulation of the input shaping technique for a flexible transmission system using MATLAB for residual vibration cancellation. The program was then implemented in TwinCAT for a real test demo, where a PLC would control an electric motor connected to a recirculating ball screw. This would move a flexible beam with, attached at the top, an arbitrary mass.

BSc Thesis:

- *Comparison of Three Fuzzy Controllers for an Industrial Linear Axis*
Comparison of three fuzzy controllers, designed in Simulink, applied to an AC Brushless motor attached to a recirculating ball screw. These controllers will then be applied to the six axes of a Gough-Stewart platform for in vitro tests in human joints.

LANGUAGES

- **Italian:** mother tongue
- **English:** C1 (IELTS score: 7.5)

TECHNICAL SKILLS

- **Basic:** C, C++, Structured text IEC 61131-3, Github, Ubuntu
- **Strong:** Python, MATLAB, SIMULINK, \LaTeX