



Marc Berneman

Electrical, Modeling and Control Engineering

Education

- 2020–2021 **Advanced Master**, *Nuclear Engineering*.
Belgian Nuclear higher Education Network
- 2018–2020 **Master of Science**, *Electrical Engineering majoring in measuring, modelling and control*, GPA – 93%, Summa Cum Laude (With Highest Distinction).
Vrije Universiteit Brussel
- 2015–2018 **Bachelor of Science**, *Electrical Engineering*, GPA – 79%, Magna Cum Laude (With High Distinction).
Vrije Universiteit Brussel

Work

- July–
September
2020 **Machine Learning Engineer Student Job**, *ETRO lab at VUB*.
Machine learning and big data for disinformation monitoring. I gained experience in Linux, Docker, BERT machine learning models for natural language processing and much more.

Internship

- July–
September
2018 **Investigating the advantages and disadvantages of small 120 GHz radar**, *Fraunhofer Institute for High-Frequency Physics and Radar Technologies (Bonn, Germany)*.
I was given a lot of freedom during this internship. Thanks to the help of my supervisor, I was able to design good experiments that gave me very clear results. Most of all I learned that an experiment needs to focus on 1 thing you want to investigate and that it is important to gather all the possible data, even if some of the data seem to be unnecessary at first.

Publications

28 October 2020 **Modeling and Control of 5-DoF Boom Crane**, *37th International Symposium on Automation and Robotics in Construction (ISARC 2020)*, Publication link.

Automation of cranes can have a direct impact on the productivity of construction projects. In this paper, we focus on the control of one of the most used cranes, the boom crane. Tower cranes and overhead cranes have been widely studied in the literature, whereas the control of boom cranes has been investigated only by a few works. Typically, these works make use of simple models making use of a large number of simplifying assumptions (e.g. fixed length cable, assuming certain dynamics are uncoupled, etc.) A first result of this paper is to present a fairly complete nonlinear dynamic model of a boom crane taking into account all coupling dynamics and where the only simplifying assumption is that the cable is considered as rigid. The boom crane involves pitching and rotational movements, which generate complicated centrifugal forces, and consequently, equations of motion highly nonlinear. On the basis of this model, a control law has been developed able to perform position control of the crane while actively damping the oscillations of the load. The effectiveness of the approach has been tested in simulation with realistic physical parameters and tested in the presence of wind disturbances.

Teaching Experience

September 2019 – present **University level tutoring in Maths and Analog Electronics.**

Tutoring 2 university students at the Free University of Brussels.

September 2017 – July 2018 **Private high school tutor in Maths and Sciences, Het Bijlesbureau.**

I love teaching. I have helped multiple friends with their maths and science courses. Often times my classmates come to me for explanation, and it is always a pleasure to help them.

Additional Skills

Word processors Microsoft Office, \LaTeX

Programming languages C++, Assembly, Java, VHDL, Python, MATLAB, Microcontroller programming

Languages

Dutch **Mother language** *Language in which my Bachelor degree was taught*

French **Mother language**

English **Excellent** *Language in which my Master degree was taught*

Hebrew **Conversationally fluent**

German **Basic** *30 hour A1 level course*