Rafal NOGA

October 1, 2014

R&D Engineer in Advanced Control Systems; PhD Candidate

My expertise is in the theory and practice of nonlinear controls and estimation with focus in cryogenics and aerospace applications. I have strong background in development of analogue and digital electronics.

Date of birth:	September 22, 1982
Citizenship:	Polish
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Skills and knowledge

Advanced Control Systems

- R&D in advanced controls
- Non-linear Model Predictive Control
- Non-linear Moving Horizon State Estimation
- Real-time, non-linear optimization
- Analysis, modelling, simulation and control:
  - for distributed parameters systems
  - for thermo-hydraulic systems with two-phase flow
  - using first-principles approach at low computing cost
- Prototype design, industrial implementation and validation of control systems

Electronics

- Analogue and digital electronic circuits development
- Embedded systems development, based on Atmel AVR microcontrollers

Programming

- Programming in C (real-time optimization and embedded systems), C++, Perl,
- Control systems development in Matlab (MEX files), Simulink and Mathematica
- SCADA panels development in Simatic WinCC
- Web applications development using PHP, Perl, MySQL, XML-XLS, HTML, CSS, Java-Script
- MS Windows, MS Office, LaTeX

Other

- Licensed motorcycle and car driver, certified inland skipper, certified glider pilot

Languages

I have been an official CERN guide giving presentations and guiding tours in Polish, English, French, German and Spanish. I have been studying and working in multiple countries.

- **Polish** mother-tongue
- **English** good communication skills
- **German** good communication skills; DSH-3 certificate in 2005
- **French** good communication skills; TCF-4 certificate in 2007
- **Spanish** good communication skills; EOI-2 certificate in 2007

Experience

2014 to present **R&D Engineer in Advanced Controls**
Soft-Sensor (start-up project); near Geneva, Switzerland
I have been developing non-linear estimation for an aerospace application - a data-fusion based variometer

2008 to 2013 **Doctoral Student and Unpaid Associate**
European Organization for Nuclear Research (CERN); Geneva, Switzerland
I have developed advanced, nonlinear state estimation and control of the Superfluid Helium Cryogenic Circuit at the Large Hadron Collider at CERN

2009 to 2010 **Special Research Student**
Osaka University Osaka, Japan
I have developed real-time, non-linear optimizations for applications in advanced control for distributed parameters systems with stiff dynamics

2007 to 2008 **MSc final project and researcher**
University of Valladolid, Valladolid, Spain
I have developed a novel first principles model and simulation for the Superfluid Helium Cryogenic Circuit at the Large Hadron Collider Prototype

2006 **Intern**
ATENA Engineering GmbH (Assystem Group), Munich, Germany
I have participated at development of hardware and software for an HIL simulation of the "A400M" military aircraft turbine engine

2004 to 2005 **Working student**
Karlsruhe University, Germany
I have developed Perl scripts for a data mining project

2000 **Intern**
Optimus S.A., Koszalin, Poland
I have worked on servicing printers and PCs

1997 to 2004 **Electronics Developer**
Freelancer, Koszalin and Gdansk, Poland
Development and repair of analogue and digital electronics for applications in automotive and consumer electronics.

Education

I am currently completing a PhD program at University of Valladolid (Spain) that is in cooperation with the European Organization for Nuclear Research (Switzerland).

2008 to present **PhD student in Process and Systems Engineering**
School of Industrial Engineering, University of Valladolid, Spain

I have completed an international program between Grenoble Institute of Technology (France), Karlsruhe University (Germany) and Gdansk University of Technology (Poland). I have worked on my Master Thesis "Modelling at University of Valladolid (Spain).

2007	**M.Sc. ("Master Recherché") in Control Engineering** École Nationale Supérieure d'Ingénieurs Électriciens de Grenoble (ENSIEG) Grenoble Institute of Technology (INPG), France
2007	**M.Sc. ("Ingénieur Diplômé") in Control Engineering** École Nationale Supérieure d'Ingénieurs Électriciens de Grenoble (ENSIEG) Grenoble Institute of Technology (INPG), France
2007	**M.Sc. ("Diplomingenieur") in Control Engineering** Department of Electrical Engineering and Information Technology Karlsruhe University, Germany
2007	**M.Sc. ("Magister Inżynier") in Control Engineering** Faculty of Electronics, Telecommunications and Informatics Gdansk University of Technology, Poland
2002	**"Technician in Electronics"** secondary school diploma awarded after 5 years of technical studies in electronics

Honors & Awards

2009	Scholar of the Japan Student Services Organization (JASSO)
2005 to 2007	Scholar of the German-French University
2004 to 2007	Scholar of the Double-Degree Programme Gdansk-Karlsruhe
2004 to 2005	Scholar of the Technical University of Gdansk September

Publications

R Noga, C de Prada, T Ohtsuka, E Blanco, and J Casas**. Non-linear Moving Horizon State Estimation and Control for the Superfluid Helium Cryogenic Circuit at the Large Hadron Collider;** *Accepted to the 53rd IEEE Conference on Decision and Control, 2014*

R Noga, T Ohtsuka, C de Prada, E Blanco, and J Casas. **Simulation Study on Application of Nonlinear Model Predictive Control to the Superfluid Helium Cryogenic Circuit***; In Proceedings of the 18th IFAC World Congress, 2011*

R Noga, T Ohtsuka. **NMPC for stiff, distributed parameter system: Semi-Automatic Code Generation and optimality condition evaluation***; In Proceedings of the 18th International Conference on Process Control, 2011*

R Noga, T Ohtsuka, C de Prada, E Blanco, and J Casas. **Nonlinear Model Predictive Control for the Superfluid Helium Cryogenic Circuit of the Large Hadron Collider***; In Proceedings of the 2010 IEEE International Conference on Control Applications, 2010*

R Noga. **Modeling and control of the String2 LHC Prototype at CERN.** Master's thesis, Gdansk University of Technology, University of Karlsruhe, Grenoble Institute of Technology, 2007