



Dr. Rafal NOGA

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R&D engineer control systems and optimization

My expertise lies in optimizing references and ensuring that systems adhere to them through feedforward and feedback. I excel in advanced control techniques including feedback loop shaping, filtering, state estimation, predictive control, supervisory control, and diagnostics. I have given hundreds of public talks in 5 languages.

Citizenship	European Union (Polish and German)
Education	PhD in Process and Systems Engineering from University of Valladolid; 4 x MSc in Control Engineering from Grenoble Institute of Technology, Karlsruhe Institute of Tech. and Gdansk University of Technology; Technician in Electronics
Langages	Polish: mother tongue; German C2; English: C2; French: C2; Spanish: C2
Licences	Car and motorcycle driver; CMAS** diver; Glider, paraglider and paramotor pilot
Programming	C, C++ (incl. for embedded systems), Python, MATLAB / Simulink, GIT, SVN
Control Systems	Sensor fusion/ non-linear state estimation: UKF, MHE; economic Non-linear Model Predictive Control; structure design; loop shaping: signal processing, controller synthesis; supervisory controls; On-Board Diagnostics (OBD); SCADA WinCC OA
Optimization	NLP, MILP; Metaheuristics; (3D) trajectory/path optimization, offline & on-line implementations; Mathematica, CasADi, ACADO, acados, PuLP, Ipopt
System Engineering	Requirements engineering; functional analysis; architecture development; UML; Sparx Enterprise Architect
Electronics	Analogue and digital circuits; embedded systems
Applied Math & Physics	Algebra, Calculus, Probability; Thermodynamics, Fluid mechanics, Mechanics, Electromagnetism
Office	MS Windows, Linux, MS Office, LaTeX, Libre Office, Gimp
Hobby	CAD Design and 3D Printing
2024 to now	Freelance R&D Engineer Control Systems & Optimization at Self-employed: <i>Providing services, training and developing solutions.</i>
2020 to 2024	Developer Flight Automation at Skysails Power GmbH: <i>R&D in controls for Airborne Wind Energy Systems: data analysis, (non-)linear dynamic models, simulations, state estimators, feedback control loops, optimization of 3D trajectories.</i>
2017 to 2020	Control Engineer at IAV GmbH: <i>R&D in controls for large wind turbines: requirements models, functional analysis and architecture of control system; dynamic models, simulations, feedback control loops, state estimation, Economic Non-linear Model Predictive Control, parameter optimization, On-Board Diagnostics.</i>
2015 to 2016	Developer SCADA WinCC OA at evosoft GmbH – part of Siemens Corporate Research: <i>SW development for Siemens Simatic WinCC OA SCADA.</i>
2014 to 2015	Entrepreneur and R&D Engineer in Advanced Controls at Soft-Sensor; <i>Client aquisition for data fusion applications, R&D for a paragliding variometer.</i>
2012 to 2015	Official Guide at European Organization for Nuclear Research CERN: <i>Giving hundreds of lectures and guiding thousands of visitors at particle physics sites.</i>
2007 to 2013	Researcher, Doctoral Student and Associate at CERN, University of Valladolid, Osaka University: <i>R&D in Economic Non-linear Model Predictive Controller for a large scale industrial cryogenic process: including novel first principles thermo-hydraulic models and optimization based non-linear state estimation</i>
2006	Intern at ATENA Engineering GmbH - part of Assystem Group: <i>development of HW and SW for HIL simulation of the “A400M” aircraft turbine engine.</i>
2004 to 2005	Working student (Perl Developer) at Karlsruhe University: <i>development of SW components for a data mining system, using perl, XML-XSLT.</i>