

Niraj Rathod

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EDUCATION

PhD	Computer Science and System Engineering IMT School for Advanced Studies, Lucca, Italy	Nov 2017 to present
	THESIS: <i>Optimal control based planning for the locomotion of a quadruped robot</i> ADVISOR: Prof. Alberto Bemporad CO-ADVISOR: Dr. Michele Focchi & Dr. Mario Zanon	
	<ul style="list-style-type: none">• To design a real-time NMPC for the locomotion of a quadruped robot over rough terrain.• Development of a rapid prototyping framework in Python to interface an optimal planner with the Robot Operating System.• Real-time implementation of the NMPC and testing it on HyQ robot in the experiments.	
MSc	Automation and Control Engineering Politecnico di Milano, Milan, Italy	Apr 2017
	THESIS: <i>Modelling, simulation and predictive control of the medium temperature Solar Cooling Plant</i> ADVISOR: Prof. Scattolini Riccardo	
	<ul style="list-style-type: none">• Modelling of a solar cooling plant using first principle and model identification techniques.• Real Time Optimizer (RTO) and linear MPC development for two layer control architecture of the plant.• Design and development of MPC for the Hybrid (MLD) model of the plant.	
B.Tech	Instrumentation & Control College of Engineering Pune (COEP), University of Pune, Maharashtra, India	May 2011
	THESIS: <i>Design and development of the variable area flowmeter</i> ADVISOR: Prof. S. D. Agashe	
	<ul style="list-style-type: none">• Design of the dynamic model of a variable area flowmeter.• Practical design of a flowmeter.	

EXPERIENCE

Apr 2019 to Jul 2021	Affiliated Researcher <i>Dynamic legged system, IIT Genova, Italy</i>	<ul style="list-style-type: none">• Work related to my PhD thesis was conducted during this position.
Oct 2018 to Mar 2019	Guest Student <i>Dynamic legged system, IIT Genova, Italy</i>	<ul style="list-style-type: none">• Work related to my PhD thesis was conducted during this position.

July 2017 to Oct 2017	<p>Guest Researcher <i>Istituto di Matematica Applicata e Tecnologie Informatiche (IMATI), CNR, Italy</i></p> <ul style="list-style-type: none"> • Stochastic modelling and statistical data analysis of exchanges of (thermal and electric) energy in the intelligent building. • Predictive control for the energy optimization of the intelligent building.
Nov 2015 to Nov 2016	<p>Research Intern <i>Ricerca sul Sistema Energetico (RSE), Milan, Italy</i></p> <ul style="list-style-type: none"> • Modelling and validation work of the Solar Cooling Plant for the master thesis was conducted during this internship.
Jun 2011 to Sep 2014	<p>System Engineer <i>Emerson Export Engineering Centre (EEEC), Pune, India</i></p> <ul style="list-style-type: none"> • Worked on the design, development and implementation of the Distributed Control System projects on DeltaV system for process industries. • Expertise in control system design implementation on DCS system. • Team lead to manage 5-6 people for SCADA development, implementation and testing for oil and gas project.

ACADEMIC PROJECTS

Mar 2016 - Jun 2016	<p><i>Control of a permanent-magnet DC motor</i> MSc Project at Politecnico di Milano</p> <ul style="list-style-type: none"> • Modelling of a motor, parameter identification and model validation. • Design of the current and speed regulator (PI) in MATLAB/Simulink using Microchip Blockset and implementation on the real system. • Static sensorless, State observer, Reduced order observer design for speed estimation and implementation along with the controller.
Oct 2015 - Mar 2016	<p><i>Optimization of the electrical life of an electric contactor</i> MSc Project with Microelettrica scientifica</p> <ul style="list-style-type: none"> • Development of the electro-mechanical model of the electric contactor and validation with the experimental data obtained from the system. • Control design for the system to minimize cost function related to power losses due to electric arc generated during the closure of a contactor.

ACHIEVEMENTS

- Won a scholarship for PhD studies at IMT Lucca.
- Won a Research grant (IMATI-005-2017-MI) for one year from Consiglio Nazionale Delle Ricerche (CNR), Milan, Italy, for the assignment of research activities under the project “I-ZEB Towards Intelligent Zero Energy Buildings for the growth of the smart city (I-ZEB Verso Edifici Intelligenti a Energia Zero per la crescita della città Intelligente)”, 27-Jun-2017.
- Beneficiary of DSU scholarship for master education at Politecnico di Milano, Oct 2014 - Feb 2017.
- B.Tech thesis was selected in top four theses of the department of Instrumentation and Control, COEP, May 2011.
- Awarded Rajarashi Shahu scholarship for Higher Secondary School (HSC) for securing grades with distinction in Secondary School Certificate (SSC), May 2005.

ACTIVITIES

- Volunteered for European union pavilion, Expo Milano, Oct 2015.
- Event Head of the Industrial Automation workshop organized in technical fest at COEP, India, Oct 2010.
- Volunteered for Common Wealth Youth Games Pune, India, Oct 2008.
- Interests: Indian classical singing, Playing Tennis, Trekking.

SUBJECTS OF INTEREST

- Model Predictive Control for legged locomotion.
- Numerical methods for Optimal Control Problem.
- Modelling and control of hybrid systems.

SKILLS

ENGLISH PROFICIENCY: TOEFL Overall Score - 90/120 (May 2012)
DEVELOPMENT TOOLS: MATLAB/Simulink, ROS, HYSDEL
LANGUAGES: Python, C, C++, L^AT_EX
GRAPHIC DESIGN: CATIA, Inkscape
WEB DESIGN: Markdown