

NGUYEN T. HUNG

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*PhD candidate in control and robotics
expected to complete by June 2021*

Education

- Sep. 2016–Present **PhD candidate**, *Institute for Systems and Robotics (ISR), Instituto Superior Tecnico (IST), University of Lisbon, Portugal.*
- April 2015 **M.S. in Electrical and Electronics Engineering**, *University Technology Petronas (UTP), Malaysia.*
- April 2010 **B.S. in Electrical and Electronics Engineering**, *Ho Chi Minh City University Technology (HCMUT), Viet Nam.*

Background

During the PhD program, I had great opportunities to take the following courses to build my background in control, estimation, optimization, and network science:

At IST Lisbon ([transcript](#))

Nonlinear control	<i>with Antonio Pascoal, at IST Lisbon, 2018</i>
Nonlinear optimization	<i>with Joao Xavier, at IST Lisbon, 2017</i>
Network science: models and distributed algorithms	<i>with Joao Xavier, at IST Lisbon, 2016</i>
Dynamical system and optimization	<i>with Joao Lemos, at IST Lisbon, 2017</i>
Estimation and classification	<i>with Jorge Marques, at IST Lisbon, 2017</i>

At the European Embedded Control Institute (EECI)

Distributed control and computation	<i>with Stephen Morse, at TU Berlin, 2017</i>
Nonlinear system	<i>with Hassan Khalil, at Paris Supélec, 2018</i>
Nonlinear model predictive control	<i>with Frank Algower, at IIT Madras, 2017</i>

Research experience

2016–Present **PhD work**, *ISR/IST, Lisbon, Portugal and AMOS center, NTNU, Trondheim, Norway.*

Working on several EU projects such as MARINEUAS, WIMUST, OCEANTECH, with the focus on navigation, guidance, and control of multiple autonomous vehicles.

- Develop several cooperative path following algorithms for coordination control of multiple autonomous vehicles. Implement the algorithms with real autonomous underwater vehicles.
- Develop an MPC framework for simultaneous target localization and tracking using autonomous vehicles.
- Develop a cooperative distributed estimation and control strategy for range-based simultaneous target localization and pursuit using multiple robots.
- Develop a framework for consensus/coordination/synchronization of a nonlinear multi agent system with event-triggered communications.

Software experience: Matlab/C++/Python/ROS

Robot experience: [MEDUSA](#) underwater robots

- 2012–2015 **Research engineer, EE department, UTP.**
Modelling, system identification, and control of process plants.
- Develop black-box models (ARX, state-space, neuro-fuzzy) for a real lab-scaled gaseous pilot plant.
 - Develop and implement control strategies (PID/MPC) for the real gaseous pilot plant.
- Software experience: Matlab*
Hardware experience: PCI Card interface/ real gaseous pilot plant
- 2010–2012 **Research engineer, Schneider Electric automation design center, HCMUT.**
Study and develop a redundancy solution for a distributed industrial network control system.
- Design and setup a research and training lab in industrial network control system based on the instruments of Schneider Electric.
 - Develop a solution for Programmable Logic Controller (PLC) redundancy based on Unity Pro software and Premium PLC of Schneider Electric
- Software experience: SCADA Citect, Several PLC IDEs of Siemens, Schneider Electric*
Hardware experience: PLC Schneider, PLC Siemen, Remote I/O, Industrial network (CAN, Modbus)

Teaching experience

- 2018 **Teaching assistant, IST Lisbon.**
Ph.D courses: Nonlinear Optimization with Joao Xavier, Spring semester.
- 2013-2015 **Teaching assistant and lab instructor, UTP.**
Undergraduate courses: Plant Process Control System, Industrial Automation Control System, and Modern Control Engineering.
- 2010-2012 **Lab instructor, Automatic control department, HCMUT.**
Undergraduate courses: Industrial Network, Introduction to Control Engineering.
- 2010-2012 **Trainer, Schneider Electric Automation Design Center.**
Industrial courses for Schneider's customers in Vietnam and Cambodia: PLC Twido, PLC Premium, SCADA Citect, Unity Pro, Industrial Network (Modbus TCP/IP, Modbus RTU, CANopen).

Software experience

MATLAB/Simulink, C++, Python, ROS, Linux, Git, Latex

Hand-on experience

Microcontrollers, Programmable Logic Controller (PLC), Inverter, PCI cards, HMI, industrial network (CAN, Modbus RTU, Modbus TCP/IP)

Awards/Honors

- 2016-2018 Marie-Curie Early Stage Researcher Fellowship, awarded by the *EU commission*.
- 2013-2015 Master scholarship, awarded by *UTP*.
- 2011 First runner up for a "control and automation solution for saving energy in university campus", awarded by *Schneider Electric of South-East Asia*.
- 2011-2012 Exemplary young lecturer, awarded by *HCMUT*.
- 2005 Third place in selection of national gifted student in Physics, awarded by the *Ministry of Education of Viet Nam*.

Languages

- Vietnamese **Native**
English **Proficient**
Portuguese **Basic**

Publications

Journals:

- J5. **Nguyen T. Hung**, Antonio M. Pascoal, Tor A. Johansen, "Cooperative path following of constrained autonomous vehicles with model predictive control and event-triggered communications", International Journal of Robust Nonlinear Control, 2020. [download](#)
- J4. **Nguyen T. Hung**, N. Crasta, David Moreno-Salinas, Antonio M. Pascoal, Tor A. Johansen, "Range-based target localization and pursuit with autonomous vehicles: An approach using posterior CRLB and model predictive control", Robotics and Autonomous Systems, 2020. [download](#)
- J3. **Nguyen T. Hung**, Antonio M. Pascoal, "Consensus/synchronization of networked nonlinear multiple agent systems with event-triggered communications", International Journal of Control, 2020. [download](#)
- J2. **Nguyen T. Hung**, Francisco Rego, Antonio M. Pascoal, "Cooperative distributed estimation and control of multiple autonomous vehicles for range-based underwater target localization and pursuit", under review at IEEE Transactions on Control Systems and Technology. [download](#)
- J1. **Nguyen T. Hung** and DSOR team, "Theory, simulations, and experiments of path following guidance strategies for autonomous vehicles: Part I", to be submitted. [download](#)

Book chapters:

- B1. Francisco C. Rego, **Nguyen T. Hung**, Colin N. Jones, Antonio M. Pascoal and A. Pedro Aguiar, Chapter 8: "Cooperative Path- Following Control with Logic-Based Communications: Theory and Practice", Navigation and Control of Autonomous Marine Vehicles, IET books, 2019. [download](#)

Conferences:

- C6. **Nguyen T. Hung**, Antonio M. Pascoal, "range-based navigation and target localization: observability analysis and guidelines for motion planning", IFAC2020, to appear. [download](#)
- C5. J. Quintas, **Nguyen T. Hung**, et al., "AUV path planning, navigation, and control using geophysical data," OCEANS 2019 - Marseille, Marseille, France, 2019. [download](#)
- C4. **Nguyen T. Hung**, F. C. Rego and A. M. Pascoal, "Event-Triggered Communications for the Synchronization of Nonlinear Multi Agent Systems on Weight-Balanced Digraphs," 2019 18th European Control Conference (ECC), Naples, Italy, 2019. [download](#)
- C3. **Nguyen T. Hung**, F. Rego, N. Crasta, Antonio Pascoal, "Input-Constrained Path Following for Autonomous Marine Vehicles with a Global Region of Attraction", The 11th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles-CAMS 2018, Opatija, Croatia. [download](#).
- C2. **Nguyen T. Hung**, Antonio Pascoal, "Cooperative Path Following of Autonomous Vehicles with Model Predictive Control and Event-Triggered Communications", 6th IFAC Conference on Nonlinear Model Predictive Control, Wisconsin, USA, 2018. [download](#)
- C1. Francisco C. Rego, **Nguyen T. Hung**, Antonio Pascoal, "Cooperative Path Following of Autonomous Marine Vehicles: Theory and Experiments", IEEE OES Autonomous Underwater Vehicle, Porto, Portugal, 2018. [download](#)