

## Overview

PhD in control and robotics, with nearly 15 years experience working in both academia and industry across Europe and Asia on control and autonomous robotic systems.

## Education

July 2021 **PhD in control of multi robotic systems**, *Tecnico Lisboa, Uni. of Lisbon*, Portugal.

Advisor: Prof. Antonio M. Pascoal.

April 2015 **M.S. of Research in process control**, *University Technology Petronas (UTP)*, Malaysia.

April 2010 **B.S. in automatic control**, *Ho Chi Minh City University Technology (HCMUT)*, Viet Nam.

## Background

My background on control, estimation, optimization, and network science were built with the following courses:

with the European Embedded Control Institute

**Distributed control and computation**

*with Stephen Morse, at TU Berlin, 2017*

**Nonlinear system**

*with Hassan Khalil, at Paris Supelec, 2018*

**Nonlinear model predictive control**

*with Frank Algower, at IIT Madras, 2017*

**Numerical optimal control**

*with Sebastien Gros, at NTNU, Trondheim, 2018*

with IST Lisbon

**Nonlinear control**

*with Antonio Pascoal, at IST Lisbon, 2018*

**Nonlinear optimization**

*with Joao Xavier, at IST Lisbon, 2017*

**Network science: models and distributed algorithms**

*with Joao Xavier, at IST Lisbon, 2016*

**Dynamical system and optimization**

*with Joao Lemos, at IST Lisbon, 2017*

**Estimation and classification**

*with Jorge Marques, at IST Lisbon, 2017*

## Research and development work experience

2024–Current **Technical Lead in control and robotics**, at ARRC, TII, Abu Dhabi, UAE.

Being responsible for managing R&D projects on autonomous aerial vehicles, in collaboration with the following industry and academia partners:

- ADASI: responsible for developing trajectory and path planning solution for multiple fixed-wing UAVs, to address the need of ADASI - a military company in UAE.
- Newyork University: managing research on motion planning and control for autonomous fixed-wing UAVs.
- Beijing Institute of Technology: managing research on guidance for target interception and cooperative formation control of multiple fixed-wing UAVs.

2021–2023 **Guidance, Navigation, and Control (GNC) Engineer**, at *Deimos-Space*, Lisbon, Portugal.

Responsible for GNC algorithm development and control system team lead for the following projects:

- ClearSpace ([clearspace.today](http://clearspace.today))

- Control and Modeling Team Lead: responsible for the design of control systems for autonomous robotic space vehicles developed by ClearSpace, a client company based in Switzerland, with the mission of removing debris from the space. My responsibilities encompass various aspects, such as coordinating a control team, constructing simulation models, implementing control systems, conducting stability analyses, and testing. One of my key contributions is the 6DOF  $H_\infty$  controller developed for the rendezvous phase, which performed exceptionally well and helped the project pass the "proof of concept" phase assessed by ESA.

- Orbital Phase Team Lead: responsible for the development of orbital propagator and estimator, attitude control, and guidance algorithms for the entire orbital phase.

- Launching vehicles with Orbex ([orbex.space](http://orbex.space)):

- Control and Modeling Team Lead: responsible for the modeling, simulation, and the design of control systems for launching vehicles developed by Orbex, a customer company based in UK. This also includes filter design to mitigate impact of sloshing and flexible modes. The control system designed by the team worked robustly and passed the critical design review (CDR) of the project, meeting the requirements of both the customer company and ESA.



2016–2021 **PhD work**, at *ISR/IST, Lisbon, Portugal* and *AMOS center, NTNU, Trondheim, Norway*.

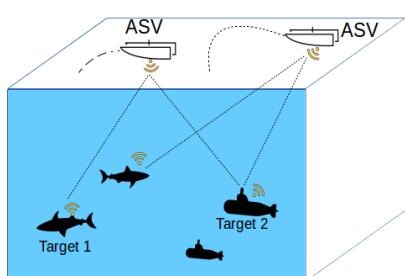
My PhD work involves development of guidance, control, and navigation algorithms for single and networked multiple autonomous robotic vehicles, including:

- Develop and test cooperative formation control, path following control algorithms for multiple autonomous vehicles using tools from nonlinear control, model predictive control, and network science.
- Develop cooperative motion planning, control, and navigation strategies for networked multiple robots to localize and pursue multiple targets using only range measurements from the robots to the targets. Tools used for this work include nonlinear and network control theory, distributed Extended Kalman Filter, and numerical optimizations.
- Implement and conduct field trials to test the algorithms developed with marine robots developed at IST Lisbon.

See more the PhD work at: <https://nt-hung.github.io/research/>

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

Robots used: MEDUSA - marine robots developed by the IST Lisbon



2012–2015 **Modeling and control research engineer**, *EE department, UTP, Malaysia.*

My master research work involves system identification and control of industrial process plants, including:

- Develop black-box models (ARX, state-space, neuro-fuzzy) for a lab-scaled gaseous pilot plant.
- Develop and implement control strategies (PID/MPC) to regulate the pressure in the pilot plant.

*Software used: Matlab/Simulink*

Hardware used: PCI Card interface/ real gaseous pilot plant

2010–2012 **Control engineer**, *Schneider Electric automation design center, HCMUT, Viet Nam.*

At HCMUT my work includes

- Design and setup a research and training lab about industrial networked control systems using instruments sponsored by Schneider Electric.
- Develop a solution for Programmable Logic Controller (PLC) redundancy based with Unity Pro software and Premium PLCs of Schneider Electric

## Teaching and supervision experience

2018-2021 **Supervision assistant**, *IST Lisbon.*

Assist supervising master's thesis on several topics in motion planning, guidance, navigation, and control of multiple autonomous robotic vehicles.

2018 **Teaching assistant**, *IST Lisbon.*

Ph.D courses: Nonlinear Optimization with Prof. Joao Xavier, Spring semester.

2013-2015 **Teaching assistant and lab instructor**, *UTP.*

Undergraduate courses: Industrial Automation Control System and Modern Control Engineering.

2010-2012 **Trainer**, *Schneider Electric Automation Design Center.*

Responsible for training Schneider's customers in Vietnam and Cambodia the following courses: Programmable logic controller, SCADA, and Industrial Network (CAN and Modbus network)

## Research and selected publications

Research page: <https://nt-hung.github.io/research/>

Journals:

- J7. Zichao Liua, Ziyi Wu, Toshiharu Tabuchi, **Nguyen Hung**, Cristino Souza, Chang-Hun Lee, Shaoming He, "A Data-Driven Guidance Strategy for Target Interception with Terminal Time Constraint", Journal of Aerospace Engineering, 2025, accepted. [download](#)
- J6. **Nguyen Hung**, Eduardo Cunha, Francisco Branco, Antonio Pascoal, "Target localization and pursuit with networked robotic vehicles: theory, simulation, and experiments", Journal of Field Robotics, 2024. [download](#)
- J5. **Nguyen Hung**, Francisco Rego, Joao Quintas, Joao Cruz, Marcelo Jacinto, David Souto, Andre Potes, Luis Sebastiao, Antonio Pascoal "A review of path following control strategies for autonomous robotic vehicles: theory, simulations, and experiments", Journal of Field Robotics, 2022. [download](#)
- J4. **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", IEEE Transactions on Control Systems and Technology, 2021. [download](#)
- J3. **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](#)
- J2. **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](#)

- J1. **Nguyen T. Hung**, Antonio M. Pascoal, "Consensus/synchronization of networked nonlinear multiple agent systems with event-triggered communications", International Journal of Control, 2020. [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:

- C8. Luca Morando, Sanket Ankush Salunkhe, Nishanth Bobbili, Jeffrey Mao, Luca Masci, Cristino De Souza Jr., **Nguyen Hung**, Giuseppe Loianno, "Trajectory Planning and Control for Differentially Flat Fixed-Wing Aerial Systems, ICRA 2025. [download](#).
- C7. Rodrigo Rego, **Nguyen T. Hung**, Antonio Pascoal, "Cooperative Motion Control Using Hybrid Acoustic-Optical Communication Networks", CAMS2021, 2021. [download](#).
- 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](#)

Full publications: [Google scholar](#)

## Academia services

Invited reviewer for IEEE Transaction on Automatic Control, IEEE Transactions on Robotics, IEEE Robotics and Automation Letters, Automatica, Journal of Field Robotics, ...

## Awards/Honors

- 2019-2021 Research scholarship, awarded by the *IST Lisbon*.  
2016-2018 Marie-Curie Fellowship for Early Stage Researcher, awarded by the *EU commission*.  
2013-2015 Master scholarship, awarded by the *UTP*.

- 2011 First runner up for a "control and automation solution for saving energy in university campus", Singapore 2011, 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**