Shahab Heshmati-alamdari

Associate Professor, Aalborg University

Website, Google Scholar , ORCID, Phone: +45 9903451
E-mail: shhe@es.aau.dk, Address: Jyllandsgade 21C, 9000 Aalborg, Denmark

Research interests:

Autonomous System, Robotics, Multi-robot Systems, Safe Robot Planning & Control in Uncertain and Dynamic environments, Robotic Manipulation, Human-Robot Interaction Control.

Education

- **PhD in Automatic Control and Robotics (360 ECTS)** 9/2012 - 12/2018
  National Technical University of Athens (NTUA) *Athens, Greece*
  - Dissertation Title: Cooperative and Interaction Control for Underwater Robotic Vehicles (PDF)
  - Advisor: Prof. Kostas J. Kyriakopoulos

- **KTH Royal Institute of Technology** Stockholm, Sweden
  Research visit *9/2016 - 12/2016*
  - Subject: Collaborative manipulation of multiple free floating manipulators under LTL specifications
  - Collaborating with Prof. Dimos V. Dimarogonas

- **MSc in Automatic Control Systems and Robotics (120 ECTS)** 10/2009 - 10/2011
  National Technical University of Athens (NTUA) *Athens, Greece*
  - MSc Thesis Title: Analysis, Modeling and Control of an Inverted Pendulum (PDF)
  - Advisor: Prof. Kostas J. Kyriakopoulos

- **MEng in Mechanical Engineering (300 ECTS)** 10/2002 - 10/2009
  National Technical University of Athens (NTUA) *Athens, Greece*
  - MEng Thesis Title: Installation, testing and comparative evaluation of smoke meter AVL415s,
  - Advisor: Prof. Dimitrios Hountalas

Employment and Research Experience

- **Aalborg University (AAU), Department of Electronic Systems** Aalborg, Denmark
  Associate Professor in Robotics *4/2023 - present*

- **Aalborg University (AAU), Department of Electronic Systems** Aalborg, Denmark
  Assistant Professor (tenure track) in Robotics *5/2021 - 3/2023*

  - Research topic: Safe learning-based planning and control of autonomous mobile robots in uncertain environments.
  - Professional Experience:
    * I have been trained (11 ECTS pedagogical courses) and have gained experience in the teaching approach "Problem Based Learning (PBL)".
    * Teaching in four courses (two MSc and two BSc), and supervising semester projects both in BSs and MSc.
    * Professional activities: AAU representative in ODENSE robotics and in START: Centre for Sustainable Agrifood Systems. Member of the executive committee of "Aalborg Robotics Challenge (ARC)".
    * Semester Coordinator (5th BSc and 1st MSc Robotic)

- **TUM Technical University of Munich, Chair of Information-oriented Control** Munich, Germany
  Postdoctoral Associate *6/2020 - 5/2021*
  - Research topic: Learning based control of autonomous robotic systems; Advisor: Prof. Sandra Hirche.

- Professional Experience: Teaching as course co-responsible in two courses. Supervision of Bachelor thesis. PhD students mentoring. Involvement as a postdoctoral associate in the European project SeaClear: SEarch, identificAtion and Collection of marine Litter with Autonomous Robots. Responsibilities and achievements:"Designing of a safe & sensor-based data-driven interaction control strategy for efficient object grasping using UVMS in uncertain and dynamic environments".

- **KTH Royal Institute of Technology, Department of Automatic Control** Stockholm, Sweden
  Postdoctoral researcher (funded by Kunt & Alice Wallenberg foundation (KAW)) *1/2019 - 6/2020*
  - Research topic: Robust control under High-Level Specifications for single and multiple robots. Advisor: Prof. Dimos V. Dimarogonas
  - Professional Experience: Proposal writing for i) two European H2020, and ii) two Swedish projects. Co-supervision of PhD students. Program organizer of NetCon workshop "scientific seminar on decision and control".

- **NTUA, Control Systems Lab** Athens, Greece
  PhD researcher *2014 - 12/2018*
  - Research topic: Development and implementation of robust & sensor-based control strategies for autonomous single and multiple robotic systems. Advisor: Prof. Kostas J. Kyriakopoulos
  - Professional Experience: Co-supervision of master students. Research involvement in EU projects:
    * THE: The Hand Embodied, Funding agency: FP7-ICT. 2010-2014. Responsibilities and achievements: "Design and experimental validation of visual feedback algorithms based on Prescribed Performance Control (PPC) technique for mobile manipulator systems".
    * RECONFIG: Cognitive, Decentralized Coordination of Heterogeneous Multi-Robot Systems via Reconfigurable Task Planning, funding agency: FP7 ICT-9. 2013-2016. Responsibilities and achievements: "Development of sensor-based control cooperative manipulation control algorithms for collaborative mobile robots under implicit communication".
    * PANDORA: Persistent Autonomy through learNing, aDaptation, Observation and ReplAnning, funding agency: FP7: Cognitive Systems and Robotics (STREP). 2012-2015. Responsibilities and achievements: "Design sensor-based interaction control laws for underwater vehicle manipulator systems to achieve user-defined manipulation tasks".
    * CO4ROBOTS: Achieving Complex Collaborative Missions via Decentralized Control and Coordination of Interacting Robots, Funding agency: H2020-ICT-2016-1 EU project. 2017-2020. Responsibilities and achievements: "Development of an automatic approach for selection of the optimal grasp points on an object for collaborating mobile manipulators in order to increase manipulability".

- **EU Marie Curie ROBOCADEMY** Athens, Greece
  Marie Curie grant holder *2014-2017*
  - Research topic: Development and implementation of cooperative and interaction control strategies for autonomous single and multiple underwater robotic systems considering significant issues such as: external disturbances, limited power resources, strict communication constraints along with underwater sensing and localization issues.
  - Responsibilities: Grant Holder and Workpackage leader responsible for preparation of deliverables, representation of NTUA at annual and review meetings, group leading in management issues, preparation of Network Training held in Athens with title: "Robotic Motion Planning for Non-holonomic and Multi-Agent Systems".

Awards, Scholarships and Honors

- **AAU - Career Grant Package** Aalborg, Denmark
  Awarded grant package providing funding for one person hiring to promote excellence among young faculty *06/2025*
- **AAU - TECH Faculty's First Talent Program** Aalborg, Denmark
  Awarded research leader talent special training package. *2024*

- **Postdoctoral scholarship at KTH, Department of Automatic Control** Stockholm, Sweden
  Awarded a Postdoctoral position funded by Kunt & Alice Wallenberg foundation (KAW) among 120 *candidates from all over the world.* *8/2018*
- **ERCIM Alain Bensoussan Postdoctoral Fellowship** Trondheim, Norway
  Awarded ERCIM Alain Bensoussan Postdoctoral Fellowship within 222 submissions of researchers from all over the world *9/2018*
- **Marie Sklodowska-Curie actions research fellowships** Europe
  *Awarded Marie Sklodowska-Curie actions research fellowship under the research project "*Robocademy*" for the development of the research career, in Control System Laboratory, Mechanical Engineering Department of National Technical University of Athens.* *2014-2017*
- **National Technical Univerity of Athens** Athens, Greece
  Thomaidion Award for Scientific Publications for consecutive years *2014-2019*
- **Ministry of foreign affairs of Greece** Athens, Greece
  Awarded Undergraduate scholarship founded by ministry of foreign affairs of Greece *2003-2009*

Supervision

- **Postdoc & Phd student supervision & co-supervision**
  - Rahul Misra (postdoc), Department of Electronic Systems, Aalborg University, Co-supervision 2024-present
  - Angus Lynch (PhD student), PhD title: "Autonomous Perching and Manipulation Capable UAVs for the Increase in Dexterity and Operation Time of Complex Missions", PhD student at the Department of Mechanical and Mechatronics Engineering at the University of Auckland, New Zealand (Main supervisor: Minas Liarokapis).
  - Corey Duguid (PhD student), PhD title: "Perching Capable UAVs for the Autonomous Inspection of Power Lines", PhD student at the Department of Mechanical and Mechatronics Engineering at the University of Auckland, New Zealand (Main supervisor: Minas Liarokapis).
  - Shifei Duan (PhD student), PhD title: "Robot Grasping and Dexterous Manipulation", PhD student at the Department of Mechanical and Mechatronics Engineering at the University of Auckland, New Zealand (Main supervisor: Minas Liarokapis).
  - Felipe Padula Sanches (PhD student), PhD title: "Human to Robot Skill Transfer in Robotic Grasping and Dexterous Manipulation", PhD student at the Department of Mechanical and Mechatronics Engineering at the University of Auckland, New Zealand (Main supervisor: Minas Liarokapis).
- **BSc & MSc Thesis:**
  - Oghuz Madinali "Sensor based motion planning and control of a mobile robot" MSc thesis, Aalborg University, 2025
  - Villiam Østergaard Brøkner, Frederik Horn-Petersen, Rasmus Brock Jensen, Anton Warming Arent, Takekazu Gade Nakabayashi "Neural Network Based Echolocation System", BSc thesis, Aalborg University, 2025
  - Marcus Friis, Carl-Emil Fredensborg Krag, Simon Bræck Christensen, Emil Rosenlund,Christian Rhod "SLAM mobile-robot using echolocation: A graph based SLAM algorithm utilizing sound to sense the environment", BSc thesis, Aalborg University, 2025
  - Kutay Shentyurk "Robust Mobile Robot Functionality through Data-Driven Dynamic Modeling and Control", MSc thesis, Aalborg University, 2024
  - Hamza Abdinassir Hassan "Tube-based Nonlinear Model Predictive Control for Multi-agent System in Unknown Environments", MSc thesis, Aalborg University, 2024
  - Jakob Gjøderum Jørgensen, Asbjørn Møller Andersen, Mads Wenneberg Mikkelsen, Hector Gabriel Fabricius "Robust Adaptive Path Planning for the 'Migatronic CoWelder' Robotic Welding System", BSc thesis, Aalborg University, 2024

- Haris Alagic, Tobias Busk Jensen, Nichlas Overgaard Laugesen, "Development of a Robust Obstacle Avoidance Controller for the Nonholonomic TurfTank Autonomous Robotic Vehicle ", BSc thesis, Aalborg University, 2024
- Marco António de Oliveira Quaresma Ferreira Alemão "Offshore Platform Mapping: Autonomous SLAM and 3D Scanning With a Quadruped Robot" , MSc thesis, Aalborg University, 2023
- Johannes Bach Larsen, Thomas Schou Sørensen "Design of Robotic End-of-Line Packaging Cell" , BSc thesis, Aalborg University, 2023
- Jon Tamang Ringstrom, Daniel Kruse-Pedersen, Jimmi Batsberg Jensen, Victor Hagbard Bjorholm, "Kinematically verified pathfinding algorithm for navigation hospital beds using MiR 250" BSc Thesis, Aalborg University, 2022
- Inaki Pujol Carmona & Mark Richard Blankensteiner, "Real world development and test of a mobile hybrid robot platform", MSc thesis, Aalborg University, 2022
- Martin Zimmermann, "Development of a data based sensor fusion algorithm for unmanned underwater vehicles", BSc thesis, TUMunich, 2021.
- Spyridon Tarantos, "Optimal Grasp Points Selection for Cooperative Underwater Vehicle - Manipulator Systems", MSc thesis, 2017 (Main supervisor: Kostas J. Kyriakopoulos).
- Aris Kanellopoulos, "Robust Non-linear Variable-Horizon Model Predictive Control for Aggressive Maneuvering", MSc thesis, NTUA, 2016 (Main supervisor: Kostas J. Kyriakopoulos).

- **Student group projects:**
  - Mads Majlund Thomsen, Daniel Holst Dreier, Thor Ivarsen Østergård, Jens Søby Hansen, Mayvand Basir Hotaki, André Vester Magnusson "Autonomous Drone Navigation for Pesticide Distribution in Orchards"4th semester's robotics project, Aalborg university 2025.
  - Oghuz Madinali " Internship in the Robotics and Simulation technologies department for the Process Control and Automation in Industry 4.0." 9th semester's Robotics Master (internship), Aalborg university 2025.
  - Adam Gerstnerlund, Davide Ragogna, Haris Alagic, Magnus Bøgh-Larsen, Ozan Gazi Yücel"Vision-Language Navigation For Home Environment" 7th semester's Robotics Master, Aalborg university 2024.
  - Benjamin Hermansen, William Bygballe Holm, Lukas Kjeld Helle, Santhosh Udayakumar, Søren Nielsen Alsen, Karl Hagenau Johansen, "Site patrol security robot" 1th semester's robotics project, Aalborg University 2024.
  - Oliver Fast Lambertsen, Bjarke Holmegård Hansen, Kasper Busch, Alexander Prosberg Holt, Søren Nielsen Alsen, William Bygballe Holm "Automation of soil tests" 1th semester's robotics project, Aalborg University 2024.
  - Benjamin Buurgaard Jørgensen, Morten Sørensen, Minik Heilmann, Pierre Emil Mortensen, Signe B. Andreasen, Signe Møller-Skuldbøl "Control of aerial drone in smart farming: Monitoring farmland by drone mapping" 4th semester's robotics project, Aalborg university 2024.
  - Emil H. Bennetsen, Emil Jensen, Magnus G. Darø, Mikkel K. Nejmann, Simon Donslund"Navigation of an aerial drone in MARS specified by the tasks for the "European Rover Challenge (ECC)" competition" 4th semester's robotics project, Aalborg university 2024.
  - Adrian Iribar, Dadi Hrannar Davidsson, Lasse Due Hornshøj, Oghuz Madinali, Søren Haugaard"Safe Navigation of Mobile Robots in Crowded Uncertain Environments Utilizing Reinforcement Learning" 7th semester's Robotics Master, Aalborg university 2023.
  - Hamza Abdinassir Hassan"Model Predictive Control (MPC) control of Capra trailer robot" 9th semester's Robotics Master, Aalborg university 2023.
  - Kutay Shentyurk"Multipurpose Test Setup (Burnin) Development for Capra Robotics" 9th semester's Robotics Master, Aalborg university 2023.
  - Jacob Leif Studsgaard Slot, Jan Bauke Rinzema Benedictus, Jens Petersen Jørgensen, Magnus Jensen Carlsen, Rasmus Borggreen Christensen, Tobias Lund Rauh, "An autonomous sand cleaning" 1th semester's robotics project, Aalborg University 2023.

- Asbjørn Møller Andersen, Carsten H.P. Nielsen, Emil Frydenholm, Haris Alagic, Jakob Gjøderum Jørgensen, Mads Wenneberg Mikkelsen "A Robotic Solution for Increasing Crop Yield in Regions Suffering Pollinator Decline" 4th semester's robotics project, Aalborg University 2022.
- Kasper K. Lauritsen Emil Rosenlund Marcus Friis Mathias H. Pedersen Hjalte L. Frost Rasmus B. Jensen "Hospital Navigation" 1th semester's robotics project, Aalborg University 2022.
- Gustav Bay Nielsen, Frederik Schultz, Emil Skall, Miad Anbari "Cigarette Butts Cleanup in Parks Using a Mobile Robot" 1th semester's robotics project, Aalborg University 2022.
- Alexander Førgaard Nielsen, Christian Aleksander Hjorth,Line Micha Pedersen, Mads Frier, Stefan Vejrum, Søren Haugaard "Autonomous Robot System for Collecting and Sorting Litter" 5th semester's robotics project, Aalborg University 2022.
- Asbjorn M. Holm, Kristoffer E. Korsgaard, Patrick M. Annesen, Ibrahim Jad Masri, Morten K. Riis-Vestergaard, "Geometric Optimization of Network Controlled Parallel Manipulator", 7th semester's control and Automation, Aalborg University 2022.
- Adam Gerstnerlund, Hamza Abdinassir Yusuf, Sebastian Michael Ramm, Yaroslav Semenyuk, "Defibrillator Drone" 5th semester's robotics project, Aalborg University 2021.
- Joachim Melkaer Midtgaard, Kasper Kjaerulff Gronkjaer, Michael Siggaard Jorgensen, Mikkel Stenkjaer Hansen, Rasmus Munkso, Sophus Graarup " P.A.T.H: Porter Assistance for Transportation in Hospital" 5th semester Electronics & IT, Aalborg University 2021.
- Mads Grening Langerhuus, Magnus Damsgaard Christiansen, Christian Gronborg Madsen, Kristoffer Bundgaard Christensen, Line Micha Pedersen, Lasse Due Hornshoj, Kasper Maarschalk Hytting "Robot-assisted upper limb rehabilitation controlled by EMG signas and IMU", 3th semester robotics, Aalborg University 2021.
- Simon Thostrup Kappel, Alexander Forgaard Nielsen, Christian Aleksander Hjorth, Mads Frier, Stefan Vejrum, Johannes Bach Larsen "Design of a Myoelectric and IMU Controlled Robotic Prosthesis Solution, Implementing Kinematics, Dynamics and Control" , 3th semester robotics, Aalborg University 2021.

- **PhD student mentoring:**
  - Petar Bevanda, Phd student at Technical University of Munich Department of Electrical and Computer Engineering, Germany. PhD title: "Learning Koopman Operator Representations for Dynamics and Control", main supervisor: Prof. Sandra Hirche, 2021-present.
  - Samuel Tesfazgi, Phd student at Technical University of Munich Department of Electrical and Computer Engineering, Germany. PhD title: "Human intention estimation in physical human-robot interaction", main supervisor: Prof. Sandra Hirche, 2021-present.

Teaching

- **Aalborg University (AAU), Department of Electronic Systems**
  - Motion planning and path planning (6th BSc Robotics), Main course Responsible and Instructor, 2022-
  - Robot mobility (1th MSc Robotics), Main course Responsible and Instructor, 2023-
  - Robot navigation (1th MSc Robotics), Course Co-responsible, 2022-
  - Actuators, Drivers and Electronic Modules (3th BSc Robotics), Course Co-responsible, 2021-22
- **Technical University of Munich (TUM), Department of Electrical and Computer Engineering**
  - Scientific Seminar Networked Systems and Control (2th MSc Electrical and Computer Engineering), Course Co-responsible, 2020
  - Project Laboratory Networked and Cooperative Control (6th BSc Electrical and Computer Engineering), Course Co-responsible, 2020
- **National Technical University of Athens (NTUA), Mechanical Engineering Department**

- Control systems I & II (Linear Systems & Optimal Control), Teaching & Lab Assistant, 2014-2018
- Robotics (Introduction to Robotics & Analysis & Intelligent Robotic Systems), Lab Assistant, 2014-2018

Grants, Projects and Funds

- **Grants as PI or Coordinator:**
  - **Coordinator**: "SonicEye: AI-Enhanced Echolocation for Multimodal Robot Navigation in Harsh and GPS-Denied Environments" 2025 (3 million DKK)
  - **Grant Holder**: "AAU Career Grant Package" 2025 (0.6 million DKK)
  - **Co-PI**: ESA OSIP "SKYWALKER: Safe Reinforcement Learning for Multi-Step Robotic Crawling and Navigation on Large Space Structures" 2025 (100k Euro)
  - **PI**: Eurogia2023 "BladeDoctor: Development of an efficient, reliable, versatile and fail-safe robotic maintenance system for wind turbine blades" 2025 (AAU 330k Euro)
  - **Grant Holder**: "EUopSTART" grant for successful coordination and submission of the HORIZON-MSCA-2023-DN-01 (MSCA Doctoral Networks 2023) project proposal entitled: "EnviRob: Advancing ENVironmental sustaInability with heteRogeneOus roBotics", grant ID:3174-00036B (75000dkk)
  - **Grant Holder:** Danish Data Science Academy (DDSA) supporting grant for the Kick-Off Event: Aalborg Robotics Challenge (ARC), Grant ID: DDSA-SE-2023-008 2023 (46000dkk).
  - **PI:** DEFTNESS: increaseD capabilitiEs oF heTerogeNeous robots for thE conStruction induStry, 2022 (166000 dkk).
  - **PI:** FREYA: FutuRE robotic Yield monitoring for Agriculture, 2023 (170000dkk).
  - **PI:** DISARM – Drone- and Mobile Robot Integrated System for Automated UXO Removal and Mapping, 2023 (232000dkk).
  - **Grant Holder:** *EU Marie Curie* ROBOCADEMY: European Academy for Marine and Underwater Robotics, Funding agency: EU Marie Curie Program (7th Framework Programme). Role: Grant Holder & leader & Researcher. 2014-2017
- **Involvement as a Researcher:**
  - EU project THE: The Hand Embodied, Funding agency: FP7-ICT. Role: Researcher. 2010-2014.
  - EU project RECONFIG: Cognitive, Decentralized Coordination of Heterogeneous Multi-Robot Systems via Reconfigurable Task Planning, funding agency: FP7 ICT-9. Role: Researcher 2013-2016.
  - EU project PANDORA: Persistent Autonomy through learNing, aDaptation, Observation and ReplAnning, funding agency: FP7: Cognitive Systems and Robotics (STREP), Role: Researcher. 2012-2015.
  - EU project CO4ROBOTS: Achieving Complex Collaborative Missions via Decentralized Control and Coordination of Interacting Robots, Funding agency: H2020-ICT-2016-1 EU project, Role: Researcher. 2017-2020.
  - EU project SeaClear: SEarch, identificAtion and Collection of marine Litter with Autonomous Robots, Funded under H2020-EU.2.1.1, grant agreement No. 871295. Role: Postdoctoral Researcher. 2020-2021

Professional Development & Continuing Education

- **Pedagogical:**
  - "AAU - Basic course in Problem Based Learning (PBL)", 2 ECTS course Autumn 2021
  - "AAU - Basic course in Higher Education pedagogy", 2 ECTS course Spring 2022
  - "AAU - University Pedagogical Programme", 7 ECTS including five course modules, 2022
- **Scientific:**

- "Advanced Principles of Robotics", Network workshop, Additional Education 6 months 2015
- "Autonomous Underwater Robotics", Additional Education, 1 week, University of Girona, Spain 2015
- "Machine Learning for Autonomous Robots", Additional Education, 1 week, DFKI, Germany 2015
- "Robotic Motion Planning for Non-holonomic & Multi-Agent Systems", Additional Education, 2 days, NTUA, Greece 2016
- "Operation of Underwater Vehicles", Additional Education, 1 week, Graaltech, Italy 2017
- "Underwater sensing and vehicle operation", Additional Education, 1 week, CMRE, Italy 2017

- **Leadership & Management:**
  - "Presentation & Communication skills", Additional Education provided by Prof. David Lane, Heriot Watt university, Edinburgh, UK 2015.
  - "Team management & Negotiation Skills", Additional Education, 2 days, ATLAS ELEKTRONIK, Bremen, Germany 2016
  - "AAU - Project Management for Researchers, module A" 2022

Professional Activities

- **Memberships & Organization :**
  - **University representative at "ODENSE Robotics"** Denmark
    Denmark's national robot, automation and drone cluster. *2022- present*
  - **Member of the executive committee "ARC: Aalborg Robotics Challenge"** Aalborg, Denmark
    Common cross-faculty AAU initiative within robotics *2022- present*
  - **Organizing Committee Member:** 21th IFAC World Congress 2021, Munich, SwarmAware(workshop) at "SRDS2025" Porto, Marine Robot Control (workshop) at "Breaking the Surface2024" Zagreb, ARC robot day (workshop), Aalborg 2024 & 2023, NetCon (scientific seminar on decision and control) Stockholm 2021
  - **Program committee member & Associate Editor:** AE of IEEE ICRA 2025, AE of 16th IEEE/SICE ISSI 2024, Session chair "Nonlinear Control " 30th MED 2022, Advisory Board of journal Industrial Robots Emerald,
  - **Assessment & Evaluation committee:** Sebastian Hjorth (AAU, 2023, PhD, committee chair), Shengyuan Luo (AAU 2023, PhD, committee chair), Achilleas Seisa (LTU 2023, Licentiate, main censor) , Yu Zhu (PhD, AAU 2024), Arunabha Majumder (AAU 2024, First year evaluation opponent)
  - **External Evaluation Committee:** (i) Artificial Intelligence (90 ECTS, Master) European University of Cyprus, AI for Digital Business (120 ECTS, Diploma) Ledra College Cyprus, Automative Tech (120 ECTS, Diploma) MIEEK & IPS UCLAN.
  - **Invited talks:** DACAS(Denmark) 2024; Cyprus University of Technology 2024; Lulea university of technology (Sweden) 2023; TUwien 2023; Presentation in conferences from 2015.

- **Reviewing and assessment:**
  - **Journal Reviewer**

    • IEEE Transactions on Robotics • IEEE Transactions on Automation Science and Technology • IEEE Transaction on Control System Technology, • IEEE Robotics and Automation Letters • IEEE Transaction of Control • IEEE Transactions on Network Science and Engineering • IEEE Transactions on Control of Network Systems. • IEEE Journal of Oceanic Engineering • IEEE Transactions on Cybernetics • IEEE Transactions on Industrial Electronics • IEEE Transactions on Vehicular Technology • IEEE Transactions on Mechatronics • Journal of Field Robotics, Wiley • Artificial Intelligence Review • Control Engineering Practice • Nature Scientific report • International Journal of Control • IET Control Theory & Applications • European Journal of Control • Engineering, IEEE Transactions on Cybernetics. • Autonomous Robots, Springer • Journal of Intelligent & Robotic Systems • Sensors • Journal of the Franklin Institute • Energies • Journal of Marine Science and Application

– **Conference Reviewer**
• IEEE Conference on Decision and Control (CDC) • IEEE American Control Conference (ACC) • IEEE International Conference on Robotics and Automation (ICRA) • IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) • IEEE International Conference on Automation Science and Engineering • IEEE Conference on Control Technology and Applications • IEEE European Control Conference • IEEE Mediterranean Conference on Control and Automation • IEEE Conference on Control Technology and Applications • IFAC Conference on Intelligent Control and Automation Sciences (ICONS) • IFAC World Congress • European Robotics League (ERL)

Publications

All papers are available on my homepage: https://shahabheshmati.github.io/publications.html.

Google Scholar: https://scholar.google.se/citations?user=4mpRGtIAAAAJ&hl=en

Journal Publications:

[**J1**] Charalampos P Bechlioulis, George C Karras, **Shahab Heshmati-alamdari**, Kostas J Kyriakopoulos, "Trajectory Tracking With Prescribed Performance for Underactuated Underwater Vehicles Under Model Uncertainties and External Disturbances", IEEE Transactions on Control Systems Technology, vol 25, p. 429-440, 2016.
DOI: 10.1109/TCST.2016.2555247

[**J2**] **Shahab Heshmati-alamdari**, Charalampos P. Bechlioulis , George C. Karras, Alexandros Nikou, Dimos V Dimarogonas, Kostas J. Kyriakopoulos"A Robust Interaction Control Approach for Underwater Vehicle Manipulator Systems", IFAC Annual Reviews in Control Journal, Vol 46, p.315-325, 2018 [Video].
DOI:https://doi.org/10.1016/j.arcontrol.2018.10.003

[**J3**] Charalampos P Bechlioulis, **Shahab Heshmati-alamdari**, George C. Karras, Kostas J. Kyriakopoulos"Robust Image Based Visual Servoing with Prescribed Performance under Field of View Constraints", IEEE Transactions on Robotics, vol: 35, p. 1063-1070, 2019, [Video].
DOI: 10.1109/TRO.2019.2914333.

[**J4**] **Shahab Heshmati-alamdari**, George C. Karras, Panos Marantos, and Kostas J. Kyriakopoulos, "A Robust Predictive Control Approach for Underwater Robotic Vehicles", vol: 28, p.2352-2363, 2019 [Video].
DOI: 10.1109/TCST.2019.2939248

[**J5**] **Shahab Heshmati-alamdari**, Charalampos P. Bechlioulis, George C. Karras, Kostas J. Kyriakopoulos, "Cooperative Impedance Control for Multiple Underwater Vehicle Manipulator Systems under Lean Communication" IEEE Journal of Oceanic Engineering, vol: 46, p.447-465, 2020.
DOI: 10.1109/JOE.2020.2989603.

[**J6**] Alexandros Nikou, **Shahab Heshmati-alamdari**, Dimos V. Dimarogonas"Scalable Time-constrained Planning of Multi-robot Systems", Autonomous Robots, Springer, vol: 44, p. 1451–1467, 2020, [Video].
DOI: https://doi.org/10.1007/s10514-020-09937-6

[**J7**] **Shahab Heshmati-alamdari**, Alexandros Nikou, Dimos V. Dimarogonas"Robust Trajectory Tracking Control for Underactuated Autonomous Underwater Vehicles in Uncertain Environment", IEEE Transactions on Automation Science and Engineering, vol:18, p. 1288-1301, 2020, Video
DOI: 10.1109/TASE.2020.3001183.

[**J8**] **Shahab Heshmati-alamdari**, Alina Eqtami, George C. Karras, Dimos V. Dimarogonas, Kostas J. Kyriakopoulos "A Self-triggered Position Based Visual Servoing Model Predictive Control Scheme for Underwater Robotic Vehicles" Machines, MDPI, 2020.
DOI: https://doi.org/10.3390/machines8020033

[**J9**] Alexandros Nikou, **Shahab Heshmati-alamdari**, Dimos V. Dimarogonas "A Robust Nonlinear MPC Framework for Control of Underwater Vehicle Manipulator Systems under High-Level Tasks", IET Control Theory & Applications, vol: 15, p.323-337, 2021.
DOI: https://doi.org/10.1049/cth2.12045.

[**J10**] **Shahab Heshmati-alamdari**, George C. Karras, Kostas J. Kyriakopoulos"A Predictive Control Approach for Cooperative Transportation by Multiple Underwater Vehicle Manipulator Systems", IEEE Transactions on Control Systems Technology,, vol:30, p. 917-930, 2021,[Video].

DOI: 10.1109/TCST.2021.3085121

[**J11**] George Karras, George K. Fourlas, Alexandros Nikou, Charalampos Bechlioulis, **Shahab Heshmati-alamdari** "Image Based Visual Servoing for Floating Base Mobile Manipulator Systems with Prescribed Performance under Operational Constraints" Machines, MDPI, 2022.

[**J12**] **Shahab Heshmati-alamdari**, Maryam Sharifi, George C. Karras, George K. Fourlas, "Control Barrier Function Based Visual Servoing for Mobile Manipulator Systems under Operational Constraints" Elsevier Robotics and Autonomous Systems, 2024.

[**J13**] Athina Ilioudi, Stefan Sosnowski, Elizabeth Banken, Petar Bevanda, Jan Bruedigam, Lucian Busoniu, Yves Chardard, Cosmin Delea, Bart De Schutter, Antun Duras, Claudia Hertel-ten Eikelder, **Shahab Heshmati-alamdari**, Ivana Palunko, Iva Pozniak, Domagoj Tolic, "The SeaClear System: A Multi-robot Solution for Autonomous Cleanup of Marine Debris on the Seabed", Elsevier Engineering Applications of Artificial Intelligence, (Under review) .

[**J14**] Henrik Schiøler, **Shahab Heshmati-alamdari**, Torben Knudsen, Kirsten Mølgaard, Jens Dalsgaard, Flemming Christensen, "NLoS Detection for Ultrasonic Localization in Cluttered Environments Through Probabilistic Obstacle Modeling", IEEE Transactions on Automation Science and Engineering, 2025 (under review)

[**J15**] Daniel Doroshenko, Maryam Sharifi, Henrik Schiøler, **Shahab Heshmati-alamdari** "Safety Barrier Functions for Image-Based Visual Servoing in Non-Holonomic Mobile Manipulator Systems" IIEEE Transactions on Automation Science and Engineering, 2025, (To be submitted end of Q3-2025).

[**J16**] Alina Eqtami, **Shahab Heshmati-alamdari** "An Event-Based Predictive Control Framework for Mobile Robots Under Operational Constraints" Elsevier Robotics and Autonomous Systems (To be submitted end of Q3-2025).

Conference Publications:

[**C1**] Alina Eqtami,**Shahab Heshmati-alamdari**, Dimos V Dimarogonas, Kostas J Kyriakopoulos, "Self-triggered model predictive control for nonholonomic systems", European Control Conference (ECC), 2013.

[**C2**] Alina Eqtami, **Shahab Heshmati-alamdari**, Dimos V Dimarogonas, Kostas J Kyriakopoulos, "A self-triggered model predictive control framework for the cooperation of distributed nonholonomic agents", IEEE 52nd Annual Conference on Decision and Control (CDC), 2013.

[**C3**] **Shahab Heshmati-alamdari**, Alina Eqtami, George C Karras, Dimos V Dimarogonas, Kostas J Kyriakopoulos, "A self-triggered visual servoing model predictive control scheme for under-actuated underwater robotic vehicles", IEEE International Conference on Robotics and Automation (ICRA), 2014, [Video].

[**C4**] **Shahab Heshmati-alamdari**, George K Karavas, Alina Eqtami, Michael Drossakis, Kostas J Kyriakopoulos, "Robustness analysis of model predictive control for constrained image-based visual servoing", IEEE International Conference on Robotics and Automation (ICRA), 2014.

[**C5**] Natalia Hurtos, Narcis Palomeras, Arnau Carrera, Marc Carreras, Charalampos P. Bechlioulis, George C. Karras, **Shahab Heshmati-alamdari**, Kostas Kyriakopoulos, "Sonar-Based Chain Following Using an Autonomous Underwater Vehicle", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014), 2014.

[**C6**] **Shahab Heshmati-alamdari**, Charalampos P Bechlioulis, Minas V Liarokapis, Kostas J Kyriakopoulos, "Prescribed performance image based visual servoing under field of view constraints", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014), 2014, [Video].

[**C7**] **Shahab Heshmati-alamdari**, George C. Karras, Alina Eqtami and Kostas J. Kyriakopoulos,"A Robust Self Triggered Image Based Visual Servoing Model Predictive Control Scheme for Small Autonomous Robots", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015, [Video].

[**C8**] Alexandros Nikou, Christos Verginis, **Shahab Heshmati-alamdari**, Dimos V Dimarogonas, "A Nonlinear Model Predictive Control Scheme for Cooperative Manipulation with Singularity and Collision Avoidance", IEEE 25th Mediterranean Conference on Control and Automation, 2017.

[**C9**] Alexandros Nikou, **Shahab Heshmati-alamdari**, Christos Verginis, Dimos V Dimarogonas, "Decentralized Abstractions and Timed Constrained Planning of a General Class of Coupled Multi-Agent Systems", IEEE 56nd Annual Conference on Decision and Control (CDC), 2017.

[**C10**] **Shahab Heshmati-alamdari**, Alexandros Nikou, Kostas J. Kyriakopoulos, Dimos V. Dimarogonas, "A

Robust Force Control Approach for Underwater Vehicle Manipulator Systems", The 20th World Congress of the International Federation of Automatic Control (IFAC 2017), 2017.

[**C11**] **Shahab Heshmati-alamdari**, George C. Karras, Panos Marantos, and Kostas J. Kyriakopoulos, "A Robust Model Predictive Control Approach for Underwater Robotic Vehicles Operating in a Constrained workspace", Accepted IEEE International Conference on Robotics and Automation (ICRA-2018), [Video].

[**C12**] Michael Logothetis, George Karras, **Shahab Heshmati-alamdari**, Panagiotis Vlantis, Kostas Kyriakopoulos, "A Model Predictive Control Approach for Vision-based Object Grasping via Mobile Manipulator", IEEE International Conference on Intelligent Robots, IROS, 2018, [Video].

[**C13**] **Shahab Heshmati-alamdari**, Charalampos P. Bechlioulis, George C. Karras, Kostas J. Kyriakopoulos, "Decentralized Impedance Control for Cooperative Manipulation of Multiple Underwater Vehicle Manipulator Systems under Lean Communication", IEEE OES Autonomous Underwater Vehicle Symposium, 2018.

[**C14**] **Shahab Heshmati-alamdari**, George C. Karras, Kostas J. Kyriakopoulos, " A Distributed Predictive Control Approach for Cooperative Manipulation of Multiple Underwater Vehicle Manipulator Systems", IEEE International Conference on Robotics and Automation (ICRA), 2019, [Video].

[**C15**] Alexandros Nikou, **Shahab Heshmati-alamdari**, Dimos V. Dimarogonas, "Design and Experimental Validation of Tube-based MPC for Timed-constrained Robot Planning", IEEE International Conference on Automation Science and Engineering (CASE), 2019, [Video].

[**C16**] **Shahab Heshmati-alamdari**, Alexandros Nikou, Dimos V. Dimarogonas, "Robust Trajectory Tracking Control for Underactuated Autonomous Underwater Vehicles", 58th IEEE Conference on Decision and Control (CDC), Nice, France - December 11-13 2019.

[**C17**] Pedro Roque, **Shahab Heshmati-alamdari**, Alexandros Nikou, Dimos V. Dimarogonas, "Decentralized Formation Control for Multiple Quadrotors under Unidirectional Communication Constraints", 21st World Congress of the International Federation of Automatic Control (IFAC WC), Berlin, German, July 2020.

[**C18**] Petar Bevanda, Max Beier, **Shahab Heshmati-alamdari**, Stefan Sosnowski, Sandra Hirche, "Towards Data-driven LQR with KoopmanizingFlows", 6th IFAC Conference on Intelligent Control and Automation Sciences, Cluj-Napoca, Romania, 2022.

[**C19**] Alexandros Nikou, Christos Verginis, **Shahab Heshmati-alamdari**, "Aperiodic Prescribed Performance Control Scheme for Uncertain Nonlinear Systems", 30th Mediterranean Conference on Control and Automation, June 28 - July 1, 2022, Athens, Greece.

[**C20**] **Shahab Heshmati-alamdari**, George C. Karras, Maryam Sharifi, George K. Fourlas "Control Barrier Function Based Visual Servoing for Underwater Vehicle Manipulator Systems under Operational Constraints", 31th Mediterranean Conference on Control and Automation, 2023 .

[**C21**] Maryam Sharifi, **Shahab Heshmati-alamdari**, "Safe Force/Position Tracking Control via Control Barrier Functions for Free-Floating Mobile Manipulator Systems", European Control Conference ECC2024 (Accepted).

[**C22**] Angus Lynch, Joao Buzzatto, Minas Liarokapis, **Shahab Heshmati-alamdari**"Robust, Fiducial Markers Based Predictive Control Scheme for Infrastructure Inspection with Unmanned Aerial Vehicles" INTERNATIONAL CONFERENCE ON UNMANNED AIRCRAFT SYSTEMS ICUAS 2024(Accepted).

[**C23**] Maryam Sharifi, Alexandros Nikou, **Shahab Heshmati-alamdari** "Prescribed-Time Predictive Control for Mobile Robot Navigation" 32th Mediterranean Conference on Control and Automation 2024 (Accepted).

[**C24**] Angus Lynch, Chen Lyu, Joao Buzzatto, **Shahab Heshmati-alamdari**, Minas Liarokapis "Control Barrier Functions Based Visual Servoing Scheme to Safely Operate a UAV Around Fiducial Markers in GNSS Denied Settings", IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR) 2024, (Submitted).

[**C25**] Dadi Hrannar Davidsson, Lasse Due Hornshøj, Søren Haugaard, Adrian Iribar, Oghuz Madinali, Gayath Sanjula De Silva, Rahul Misra, Henrik Schiøler and **Shahab Heshmati-alamdari**, "A Safe Data-Driven Optimization Approach for Robot Navigation in Dynamic Environments", IEEE European Control Conference (ECC) 2025 (Accepted).

[**C26**] Sepideh Valiollahi, Chen Li, Emil Frydenholm, Jonas Thorhauge-Hansen, San Sami Hanona, Yacine Abdelsadok, **Shahab Heshmati-alamdari**, Stefan Nordborg Eriksen, and Preben E. Mogensen "Safe Navigation in Industrial Environments via Vision-Language Human-Robot Interaction", 34th International Conference on Robotics (RAAD) 2025, (Accepted).

[**C27**] Magnus Bøgh-Larsen, Adam Gerstnerlund, Davide Ragogna, Haris Alagić, Ozan Gazi Yücel, Sepideh Valiollahi, Suzy Choi, **Shahab Heshmati-alamdari**, Chen, Dimitrios Chrysostomou "A Vision-Language Framework

for Assistive Home Robotics" European Conference on Mobile Robots (ECMR) 2025 (accepted).

Book chapters:

[**B1**] George C. Karras, Charalampos P. Bechlioulis, Panos Marantos, **Shahab Heshmati-alamdari** and Kostas J. Kyriakopoulos, "Motion Control of Autonomous Underwater Vehicles, Part I: Modeling & Low Complexity State Estimation", in IET Book, "Autonomous Underwater Vehicles: Design and practice",, Frank Ehlers, ISBN: 978-1-78561-703-4, in press.

[**B2**] Charalampos P. Bechlioulis, **Shahab Heshmati-alamdari**, George C. Karras, Panos Marantos and Kostas J. Kyriakopoulos, "Motion Control of Autonomous Underwater Vehicles, Part II: Robust Motion Control Strategies", in IET Book, "Autonomous Underwater Vehicles: Design and practice",, Frank Ehlers, ISBN: 978-1-78561-703-4, in press.

[**B3**] **Shahab Heshmati-alamdari**, Charalampos P. Bechlioulis, George C. Karras, and Kostas J. Kyriakopoulos, "Motion Control of Autonomous Underwater Vehicles, Part II: Robust Motion Control Strategies", in IET Book, "Maritime UxVs: Methods and measurement",(under progress, to be published by the end of 2025)..