

Shahab Heshmati-alamdari

Associate Professor, Aalborg University



Date of birth: 24 May 1984, Nationality: Greek, Iranian
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Research interests:

sensor-based planning & control of autonomous robotic systems (mobile, underwater, and aerial) in uncertain & dynamic environments, constrained task planning & distributed & cooperative control of autonomous robots, interaction & cooperative manipulation control of floating-based mobile manipulator systems, human-robot interaction control, learning based 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

Professional 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 as course co-responsible 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 6/2012 - 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 Re-configurable 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”.

Supervision

• Phd student supervision & co-supervision

- Angus Lynch, 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 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 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 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:**

- 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:**

- 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.
- Asbjørn 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 Hornshøj, Kasper Maarschalk Hytting "Robot-assisted upper limb rehabilitation controlled by EMG signals and IMU", 3th semester robotics, Aalborg University 2021.
- Simon Thøstrup 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), Course Responsible, 2022-
- Robot mobility (1th MSc Robotics), Course Co-responsible, 2022-
- 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

- **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

- **Grants as PI or Coordinator:**

- **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

Awards, Scholarships and Honors

- 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 Skłodowska-Curie actions research fellowships** Europe
 - *Awarded Marie Skłodowska-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 University 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

Workshops & Seminars Participation

- **Pedagogical:**
 - “AAU - Basic course with focus on PBL”, 2 ECTS course Autumn 2021
 - “AAU - Basic course in Higher Education pedagogy”, 2 ECTS course Spring 2022
 - “AAU - University Pedagogical Programme”, 7 ECTS course including five modules, 2022- in progress (all modules are completed)
- **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 new national robot, automation and drone cluster. 2022- present
- **University representative at “START: Centre for sustainable agrifood systems”** Denmark
The first Danish platform that creates a science-driven academic research community for basic research interdisciplinary collaboration projects within the field of sustainable Agrifood Systems.
- **Member of the executive committee ”ARC: Aalborg Robotics Challenge”** Aalborg, Denmark
Common cross-faculty AAU initiative within robotics 2022- present
- **Organization of “FLL” talks** Aalborg, Denmark
Weekly scientific interdepartmental presentations 2021- present
- **Co-chair of the session “Nonlinear Control”** Athens, Greece
30th Mediterranean Conference on Control and Automation June 2022
- **Member of organization team of the 21th IFAC World Congress** Munich, Germany
The first completely virtual IFAC World Congress July, 2021
- **Program organizer of NetCon workshop** Stockholm, Sweden
Title: scientific seminar on decision and control Jan, 2021
- **Organization of scientific presentations** Stockholm, Sweden
Scientific seminars and talks Jan, 2021
- **IEEE member**

• **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)
- **Associate Editor**
 - The 2024 16th IEEE/SICE International Symposium on System Integration
- **PhD assessment committee**
 - Sebastian Hjorth (AAU, 2023, PhD, committee chair) • Shengyuan Luo (AAU 2023, PhD, committee chair) • Achilleas Seisa (LTU 2023, Licentiate, main censor)

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, “Co-operative 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. Furlas, 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] 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”, IEEE Robotics & Automation Magazine (Submitted).
- [J13] **Shahab Heshmati-alamdari**, Maryam Sharifi, George C. Karras, George K. Furlas, “Control Barrier Function Based Visual Servoing for Mobile Manipulator Systems under Operational Constraints” (Submitted).
- [J14] **Shahab Heshmati-alamdari** “Asynchronous Control of Multiple Autonomous Underwater Vehicles with Reduced Inter-Team Communication” (To be submitted).
- [J15] **Shahab Heshmati-alamdari**, Petar Bevada, Stefan Sosnowski, Sandra Hirche, “Data-driven & Sensor-Based

Control Approach for Object Grasping in Extreme Underwater Environments under Operational Constraints”, (to be submitted).

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 56th 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. Furlas “Control Barrier Function Based Visual Servoing for Underwater Vehicle Manipulator Systems under Operational Constraints”, 31th Mediterranean Conference on Control and Automation, 2023 .

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.