

Curriculum Vitae

CONTACT INFORMATION Dr Adnan Tahirovic, Dipl. El.-Ing.
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VISITING POSITIONS **Imperial College London, London, UK** **2019 -**

Visiting Researcher at Imperial College London

Imperial College London, London, UK **2018**

Academic visitor at Imperial College London

Imperial College London, London, UK **2011**

Internship at Imperial College London

California Institute of Technology, Pasadena CA, US **2010**

Internship at JPL/NASA (September-December)

Research activity: Large-scale efficient graph search algorithms, and cost-map generation for non-uniform terrains

Advisors: Gianantonio Magnani (Politecnico di Milano) and Adrian Stoica (Jet Propulsion Laboratory, Caltech)

EDUCATION **European Embedded Control Institute, International Graduate School on Control**

- 2015 EECI International Graduate School on Control, Istanbul, Turkey
Course 1: Introduction to nonlinear systems analysis and nonlinear feedback control
Lecturer: Professor Hassan K. Khalil (Michigan State University, USA)
- 2014 EECI International Graduate School on Control, Supelec Paris, France
Course 2: Model predictive control
Lecturer: Professor Jan Maciejowski (University of Cambridge, UK)
- 2009 EECI International Graduate School on Control, Supelec Paris, France
Course 3: Port-Hamiltonian Systems: from Geometric Network Modeling to Control
Lecturers: Professors Arjan van der Schaft (University of Groningen, The Netherlands)
Dimitri Jeltsema (TU Delft, The Netherlands)
- Course 4: Model Predictive Control
Lecturer: Professor Eduardo F. Camacho (University of Sevilla, Spain)

Politecnico di Milano, Milan, Italy **Januar 2008 - Februar 2011**

Ph.D., Information Technology

- Dissertation Topic: “The Development of the Virtual Rider for ATV based Mobile Robots in Rough Terrains”
Supervisor: Gianantonio Magnani, Politecnico di Milano
External Supervisor: Karl Iagnemma, Massachusetts Institute of Technology

- Minor Topic: “Improving Classification Accuracy of P300-based Brain Computer Interface Speller Device”
Advisor: Matteo Matteucci, Politecnico di Milano

**University of Sarajevo, Faculty of Electrical Engineering, Sarajevo, Bosnia and Herzegovina
July 2006**

M.S., Control theory, (2 years program)

- Topic: “Longitudinal vehicle guidance using neural networks”

**University of Sarajevo, Faculty of Electrical Engineering, Sarajevo, Bosnia and Herzegovina
September 2001**

Dipl.-Ing., Control theory, (5 years program)

- Topic: “MATLAB exercises for the control theory course”

FULL-TIME
PROFESSIONAL
EXPERIENCE

**University of Sarajevo, Faculty of Electrical Engineering, Sarajevo, Bosnia and Herzegovina
Lecturer/Seniour Lecturer/Professor September, 2012 -**

Courses: Mobile Robotics, Cognitive Robotics, Digital Signal Processing, Control System Design and Systems Engineering.

PRIZES AND
AWARDS

Microsoft Azure Research Award

Control Tower: Underwater Robotics Mission Analytics (2017)

Best Paper Award

The 10th Conference on Mobile Robots and Competitions - Robotics 2010, Leiria, Portugal

PhD Fellowship

Politecnico di Milano

DAAD Scholarship

The Fredrich-Alexander University of Erlangen-Nuernberg, Germany

Best Student of Generation Award

Faculty of Electrical Engineering Sarajevo

MENTORSHIPS AND
PARTICIPATION IN
SCIENTIFIC REVIEW
PROCESS

30 supervised masters students at the Faculty of Electrical Engineering Sarajevo.

Co-supervising of 3 PhD students.

External evaluator for a PhD thesis at Politecnico di Milano

(Supervisor of the thesis: Professor Gianni Ferretti)

Participation in review process for journal publication (27 reviews)

IEEE Transactions on Automatic Control (1), IEEE Transactions on Artificial Intelligence (2), IEEE Transactions on Industrial Electronics (1), IEEE Transactions on Robotics (4), IEEE Transactions on Control Systems Technology (2), IEEE/ASME Transactions on Mechatronics (1), Journal of Field Robotics (1), IEEE Robotics and Automation Magazine (1), Automatica (3), European Journal of Control (1), Control Engineering Practice (1), Asian Journal of Control (1), Robotica (1), IEEE Systems Journal (2), IEEE Robotics and Automation Letters - IEEE RA-L(2), Electronics Letters (1), Nature Machine Intelligence(1), Foundations and Trends in Systems and Control (1).

Participation in review process for conference proceedings (56 reviews)

American Control Conference - ACC (6), IEEE Conference on Decision and Control - CDC (9), IEEE

Multi-conference on Systems and Control (2), IEEE International Conference on Robotics and Automation - ICRA (6), IEEE/RSJ International Conference on Intelligent Robots and Systems -IROS (7), International Joint Conference on Neural Networks (1), The IEEE/ASME International Conference on Advanced Intelligent Mechatronics - AIM (2), The International Conference on Information, Communication and Automation Technologies - ICAT (5), Annual Conference of the IEEE Industrial Electronics Society - IECON (1), IEEE International Symposium on Systems Engineering - ISSE(2), IEEE Conference on Humanoid Robots(1), The International Symposium on Robotics Research(1), The European Control Conference - ECC (1), IEEE Intelligent Vehicles Symposium (1), Mediterranean Conference on Control and Automation - MED (2), International Conference on Intelligent Autonomous Systems - IAS-17 (3), International Conference on Information, Communication and Automation Technologies - ICAT (6).

RESEARCH
EXPEDITIONS AND
FUNDING

EU HORIZON-WIDERA-2021-ACCESS-05 programme 2022

Project name: Strengthening Research and Innovation Excellence in Autonomous Aerial System, AeroSTREAM

Goal: Strengthening research capacities of Bosnia and Herzegovina and Croatia in the field of mobile robotics

Responsibility: Project leader on behalf of University of Sarajevo

Partner institutions: Universidad de Sevilla (Spain), Fundacion Andaluza Para El Desarrollo Aeroespacial (Spain), University of Zagreb (Croatia), Innovation Center Nikola Tesla (Croatia), Prostar Labs (Croatia), Universiteit Twente (Netherlands).

The NATO Science for Peace and Security Programme 2015 - 2018

Project name: Unmanned System for Maritime Security and Environmental Monitoring

Goal: Design and development of a fully operational complex robotic system prototype comprised of an Unmanned Aerial Vehicle and Unmanned Underwater Vehicle capable of autonomous and cooperative mission executions related to environmental, border and port security

Responsibility: Project Co-Director at the Faculty of Electrical Engineering Sarajevo

Partner institutions: Faculty of Electrical Engineering and Computing Zagreb, University of Limerick and University of Dubrovnik

QUADRIVIO pro 2015 - 2017

Project name: QUADRIVIO pro, ATV Path Planning on Partially Known Terrains

Goal: Design of MPC framework for motion planning of a mobile vehicle

Responsibility: Project leader

Partner institutions: Politecnico di Milano

VOLUNTEERING
ACTIVITIES

Chairman of the IEEE GOLD affinity group 2006-2008

I have been actively involved in establishing the first Bosnian IEEE affinity group.

I have been elected to be the first Chairman of the IEEE GOLD - University of Sarajevo.

NONPROFESSIONAL
ACTIVITIES

Chess

Chess Candidate Master

Member of English Chess Federation, 2023

First place: Championship of Milan in 2008

Third place: Bosnian national level - category under 16

Third place: Bosnian national level - category under 18

PUBLICATIONS

1. **A. Tahirovic** and A. Astolfi, Linear-like Policy Iteration based Optimal Control for Continuous-time Nonlinear Systems, *IEEE Transactions on Automatic Control*, 2023.

2. J. Lorincz, **A. Tahirovic** and B. Stojkoska, A Novel Real-Time Unmanned Aerial Vehicles-based Disaster Management Framework, *The 29th IEEE Telecommunications Forum, TELFOR* 2021.
3. N. Osmic, **A. Tahirovic** and I. Petrovic, Risk-sensitive motion planning for MAVs based on mission-related fault-tolerant analysis. *Automatika*, 2020.
4. K. Ahmic, A. Tahirbegovic, **A. Tahirovic**, D. Watzenig and G. Stettinger, Simulation Framework for Platooning based on Gazebo and SUMO, *The 3rd IEEE Connected and Automated Vehicles Symposium, CAVS* 2020.
5. N. Kapetanovic, N. Miskovic and **A. Tahirovic**, Saliency and Anomaly: Transition of Concepts from Natural Images to Side-Scan Sonar Images, Proceedings of the 21st IFAC World Congress. 2020.
6. **A. Tahirovic** and A. Astolfi, Optimal Control for Continuous-Time Nonlinear Systems Based on a Linear-Like Policy Iteration, *The 55th IEEE Conference on Decision and Control, CDC* 2019, December, Nice, France.
7. N. Kapetanovic, N. Miskovic, **A. Tahirovic**, M. Bibuli, and M. Caccia, A side-scan sonar data-driven coverage planning and tracking framework, *Annual Reviews in Control*, 2018.
8. N. Kapetanovic, N. Miskovic, and **A. Tahirovic**, Information Gain-Guided Online Coverage Path Planning for Side-Scan Sonar Survey Missions, *The 26th Mediterranean Conference on Control and Automation, MED* 2018,, Zadar, Croatia.
9. **A. Tahirovic** and M. Feizbegovic, Rapidly exploring Random Vines (RRV) for Motion Planning in Configuration Spaces with Narrow Passages, *The International Conference on Robotics and Automation, ICRA* 2018, Brisbane, Australia
10. **A. Tahirovic** and F. Janjos, SDRE-RRT For Kinodynamic Motion Planning, *The 2018 American Control Conference, ACC* 2018, Milwaukee, Wisconsin, USA
11. Muhamed Kuric, Nedim Osmic and **A. Tahirovic**, Multirotor Aerial Vehicle modeling in Modelica, *The 12th International Modelica Conference*, 2017, Prague, Czech Republic
12. Dinko Osmankovic, **A. Tahirovic** and Gianantonio Magnani, All terrain vehicle path planning based on D* lite and MPC based planning paradigm in discrete space, *2017 IEEE International Conference on Advanced Intelligent Mechatronics, AIM* 2017, Munich, Germany
13. **A. Tahirovic** and S. Dzuzdanovic, A Globally Stabilizing Nonlinear Model Predictive Control Framework, *The 55th IEEE Conference on Decision and Control, CDC* 2016, December, USA.
14. **A. Tahirovic**, M. Brkic, A. Bostan and B. Seferagic, A Receding Horizon Scheme for Constrained Multi-vehicle Coverage Problems, *The 2016 IEEE International Conference on Systems, Man, and Cybernetics, SMC* 2016, Budapest, Hungary, October 2016
15. N. Kapetanovic, **A. Tahirovic**, G. Magnani, A Fast Cost-To-Go Map Approximation Algorithm on Known Large Scale Rough Terrains, *The IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS* 2015, Hamburg, Germany, September 28 - October 02, 2015
16. **A. Tahirovic**, M. Matteucci and L. Mainardi, An Averaging Technique for the P300 Spatial Distribution, *Methods of Information in Medicine - Focus Theme: Biosignal Interpretation II*, 2015
17. **A. Tahirovic**, M. Brkic, G. Magnani and L. Bascetta, A Planner for All Terrain Vehicles on Unknown Rough Terrains based on the MPC Paradigm and D*- like Algorithm, *ICRA14 Workshop on Modelling, Estimation, Perception and Control of All Terrain Mobile Robots, 2014 IEEE International Conference on Robotics and Automation, ICRA* 2014, Hong-Kong, China, June 1st, 2014
18. **A. Tahirovic** and A. Astolfi, A Convergent Solution to the Multi-vehicle Coverage Problem, *The 2013 American Control Conference*, June 2013, Washington, DC
19. **A. Tahirovic**, Discussion on: 'Control and navigation in manoeuvres of formations of unmanned mobile vehicles', *European Journal of Control*, Elsevier, 2013
20. **A. Tahirovic**, G. Magnani and Y. Kuwata, An Approximate of the Cost-To-Go Map on Rough Terrains, *The IEEE International Conference on Mechatronics, ICM*, February 2013, Vicenza, Italy
21. L. Bascetta, G. Magnani, M. Matteucci, D. Osmankovic and **A. Tahirovic**, Towards the implementation of a MPC-based planner on an autonomous All-Terrain Vehicle, Workshop on Robot Motion Planning: Online, Reactive, and in Real-time, *The IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS* 2012, Vilamoura, Algarve, Portugal, October 7-12, 2012
22. **A. Tahirovic**, M. Matteucci and L. Mainardi, Averaging Techniques for the P300 Spatial Distribution, *The 7th International Workshop on Biosignal Interpretation*, July 2012, Como, Italy

23. **A. Tahirovic** and G. Magnani, A Roughness-based RRT for Mobile Robot Navigation Planning, The 18th IFAC World Congress, IFAC 2011, August 2011, Milan, Italy
24. **A. Tahirovic** and G. Magnani, General Framework for Mobile Robot Navigation Using Passivity-based MPC, *IEEE Transactions on Automatic Control*, January 2011
25. **A. Tahirovic** and G. Magnani, Passivity-based Model Predictive Control for Mobile Robot Navigation Planning in Rough Terrains, 2010 in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, IROS, October 2010, Taiwan
26. **A. Tahirovic** and G. Magnani, An extension to rough terrains of the MPC/CLF mobile vehicle navigation approach, *ROBOTICA 2010: 10th Conference on Mobile Robots and Competitions*, Leiria, Portugal, (Best Student Paper Award) ROBOTICA (Portuguese national journal on robotics)
27. **A. Tahirovic**, G. Magnani and Paolo Rocco, Mobile robot navigation using passivity-based MPC, 2010 in *Proc. of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, AIM 2010, July 2010, Montreal, Canada
28. **A. Tahirovic** and B. Lacevic., Possibilities of the cross-entropy method usage in the control theory, 17th *IFAC World Congress*, July 6-11, 2008, Seoul, Korea.
29. **A. Tahirovic** and Z. Avdagic, Tracking Style Adjustment in Automatic Cruise Control, *WORLD AUTOMATION CONGRESS*, (WAC 2006), Budapest-Hungary, July 24-27, 2006.
30. **A. Tahirovic** and M. Hebibovic, A Set of Laboratory Exercises for a Synchronized Introductory Course covering both MATLAB and Control Theory, *IEEE International Conference on 'Computer as a Tool'*, (EUROCON 2005), Belgrade, Serbia, 2005.
31. **A. Tahirovic**, G. Meier, S. Konjicija, Z. Avdagic and C. Wurmthaler, Comfort Adjustment in Longitudinal Vehicle Guidance using Neural Networks, *IEEE International Conference on 'Computer as a Tool'*, (EUROCON 2005), Belgrade, Serbia, 2005.
32. **A. Tahirovic**, G. Meier, S. Konjicija, Z. Avdagic and C. Wurmthaler, Longitudinal Vehicle Guidance using Neural Networks, *IEEE International Symposium on Computational Intelligence in Robotics and Automation*, Espoo, Finland, 2005.
33. **A. Tahirovic** and M. Hebibovic, Temperature Control Simulation using Analog Fuzzy Controller, *IFAC-IEEE International workshop on Advanced Control Circuits and Systems*, Egypt, 2005.
34. B. Perunicic and **A. Tahirovic**, Simple PID Tuning Using D-stability and Parameter Plane, *IEEE International Conference on 'Computer as a Tool'*, (EUROCON), Ljubljana, Slovenia, 2003.

RESEARCH
MONOGRAPH AND
BOOKS

1. **A. Tahirovic** and G. Magnani, *Passivity-based Model Predictive Control for Mobile Vehicle Navigation*, Springer, 2013.
2. B. Lacevic, D. Osmankovic i **A. Tahirovic**, *Robot motion planning: sampling based methods* (in Bosnian), Univerzitet u Sarajevu, 2020.
3. N. Osmic, **A. Tahirovic** and B. Lacevic, *Octocopter Design: Modelling, Control and Motion Planning*, PLANJAX KOMERC, 2022.