Curriculum Vitae

Anahita Jamshidnejad

PERSONAL DETAILS

E-mail:	ana.jamshidnejad@gmail.com
Website:	`https://sites.google.com/view/ajamshidnejad/home`
Birth:	June 17, 1986
Nationality:	Iranian

CURRENT AND PAST POSITIONS

ETH Zürich, Institute for Dynamic Systems and Control

Postdoctoral Researcher (Niels Stensen Fellow)

December 1, 2017–November 30, 2018

Delft University of Technology, Delft Center for Systems and Control

Postdoctoral Researcher

June 23, 2017–November 30, 2017

Delft University of Technology, Delft Center for Systems and Control

Researcher

May 8, 2017–June 22, 2017

EDUCATION

Delft University of Technology, Delft Center for Systems and Control

PhD in Systems and Control

May 2013–June 2017, degree obtained on June 22, 2017, with the distinction *cum laude*

PhD Thesis Title: Efficient Predictive Model-Based and Fuzzy Control for Green Urban Mobility

Daily Supervisor: Prof.dr.ir. Bart De Schutter, Delft Center for Systems and Control, Delft University of Technology, The Netherlands

Advisors: Prof. Markos Papageorgiou, Dynamic Systems and Simulations Laboratory, Technical University of Crete, Greece, and Prof.dr.ir. Hans Hellendoorn, Delft Center for Systems and Control, Delft University of Technology, The Netherlands

University of Tehran, School of Mechanical Engineering

MSc in Mechanical Engineering

September 2009–January 2012, GPA: 18.35/20, in top three graduates in the faculty in 2012

MSc Thesis Title: Multi-Agent Intelligent Urban Traffic Control Using Fuzzy Logic (Grade: 19.64/20)
Advisor: Prof. Mohammad J. Mahjoob, University of Tehran, School of Mechanical Engineering, Iran

Amir-Kabir University of Technology (Tehran Polytechnic), School of Mechanical Engineering

BSc in Mechanical Engineering

September 2004–March 2009

BSc Thesis Title: Modeling and Analysis of Chatter Vibrations in Turning Considering Tool Segregation (Grade: 19.5/20)
Advisor: Prof. Abdolreza Ohadi Hamadani, Amir-Kabir University of Technology (Tehran Polytechnic), School of Mechanical Engineering, Iran

LANGUAGES

English	Excellent
Persian	Native speaker
Dutch	Good
German	Basic

FIELDS OF INTEREST

- Cooperative & coordinative multi-agent distributed systems
- Multi-level control of multi-scale systems
- Artificial-intelligence based control approaches
- Fast real-time integrated predictive control methods
- Applications in robotic systems, autonomous vehicles, biological systems, synchrotrons, freeway and urban traffic networks

COURSES ATTENDED

Dutch Institute for Systems and Control (DISC), PhD Courses, 2013–2014

- Mathematical Models of Systems
- Linear Matrix Inequalities for Control
- Model Predictive Control
- Constructive Lyapunov Methods for Stability Analysis of Dynamical Systems
- Distributed Control and Optimization in Multi-Agent Systems
- Stability, Relative Stability, and Synchronization of Dynamical Systems with Time-Delay
- Design Methods for Control Systems

I have received the DISC certificate in fulfillment of the requirements of the Dutch Institute for Systems and Control (DISC).

IDEA League, Mobility Summer School, RWTH Aachen, Germany, 2014
- Safe and Sustainable Transport

University of Tehran, 2009–2010
- Adaptive Nonlinear Control
- Advanced Automatic Control
- Fuzzy Control
- Artificial Intelligence
- Advanced Vibrations
- Advanced Mathematics
- Advanced Numerical Methods

- Finite Element Methods
- Continuum Mechanics

Tehran Polytechnic, 2005–2007
- Engineering Statistics and Probability
- Engineering Mathematics
- Ordinary and Partial Differential Equations
- Statics
- Dynamics
- Vibrations
- Mechanical Engineering Design
- Dynamics of Machinery
- Computer-Aided Design and Manufacturing (CAD-CAM)
- Application of Hydraulics and Pneumatic Systems

PUBLICATIONS

PEER-REVIEWED INTERNATIONAL JOURNAL PAPERS

9. A. Jamshidnejad, S. Lin, Y. Xi, B. De Schutter, "Erratum to Integrated Urban Traffic Control for the Reduction of Travel Delays and Emissions [IEEE Transactions on ITS, 14 (2013), 1609-1619]", *IEEE Transactions on Intelligent Transportation Systems*, accepted, June 2018.
8. A. Jamshidnejad, I. Papamichail, M. Papageorgiou, B. De Schutter, "Sustainable Model-Predictive Control in Urban Traffic Networks: Efficient Solution based on General Smoothening Methods", *IEEE Transactions on Control Systems Technology*, vol. 26, no. 3, pp. 813–827, 2017.
7. A. Jamshidnejad, I. Papamichail, M. Papageorgiou, B. De Schutter, "A Mesoscopic Integrated Urban Traffic Flow-Emission Model", *Transportation Research Part C: Emerging Technologies*, vol. 75, pp. 45–83 , 2017.
6. A. Jamshidnejad, B. De Schutter,"An Algorithm for Estimating the Generalized Fundamental Traffic Variables from Point Measurements Using Initial Conditions", *Transportmetrica B: Transport Dynamics*, 2017. doi: 10.1080/21680566.2017.1279991. To appear.
5. A. Jamshidnejad, B. De Schutter,"Estimation of the Generalized Traffic Average Speed Based on Microscopic Measurements", *Transportmetrica A: Transport Science*, vol. 11, no. 6, pp. 525–546, 2015.

JOURNAL PAPERS UNDER REVIEW

4. A. Jamshidnejad, E. Frazzoli, M. J. Mahjoob, "Integrated intelligent and predictive control: A multi-agent adaptive type-2 fuzzy control architecture", submitted to *IEEE Transactions on Cybernetics*.
3. A. Jamshidnejad, A. Ferrara, M. Zeilinger, "Bi-Level Multiple-Frequency Shrinking-Horizon MPC for Persistent Green Urban Mobility", submitted to *IEEE Transactions on Control Systems Technology*.
2. A. Jamshidnejad, G. Gomes, D. Haziza, F. Belletti, A. M. Bayen, B. De Schutter, "Integrated Offline and Online Predictive Control System within a Base-Parallel Architecture", submitted to *IEEE Transactions on Control Systems Technology*.
1. A. Jamshidnejad, R. van Kooten, P. Imhof, K. Brummelhuis, M. van Pampus, B. De Schutter, "ART-UTC: A Novel Adaptive Real-Time Urban Traffic Control Strategy", submitted to *IEEE Transactions on Intelligent Transportation Systems*.

INTERNATIONAL CONFERENCE PAPER UNDER REVIEW

10. A. Jamshidnejad, E. Frazzoli, "An Integrated Optimal and Reinforcement Learning-Based Algorithm for a Team of Collaborative Rescue Robots", submitted to the 15th International Conference on Control, Automation, Robotics, and Vision.

PEER-REVIEWED INTERNATIONAL CONFERENCE PAPERS

9. R. van Kooten, P. Imhof, K. Brummelhuis, M. van Pampus, A. Jamshidnejad, B. De Schutter, "ART-UTC: An Adaptive Real-Time Urban Traffic Control Strategy", Proceedings of the 2017

IEEE 20th International Conference on Intelligent Transportation Systems, Yokohama, Japan, pp. 1547–1552, Oct. 2017.

8. A. Jamshidnejad, I. Papamichail, H. Hellendoorn, M. Papageorgiou, B. De Schutter, "Gradient-Based Model-Predictive Control for Green Urban Mobility in Traffic Networks", Proceedings of the 2016 IEEE 19th International Conference on Intelligent Transportation Systems, Rio de Janeiro, Brazil, pp. 1077–1082, Nov. 2016.

7. A. Jamshidnejad, I. Papamichail, M. Papageorgiou, B. De Schutter, "A Model-Predictive Urban Traffic Control Approach with a Modified Flow Model and Endpoint Penalties", Proceedings of the 14th IFAC Symposium on Control in Transportation Systems (CTS 2016), Istanbul, Turkey, pp. 147–152, May 2016.

6. A. Jamshidnejad, H. Hellendoorn, S. Lin, B. De Schutter, "Smoothening for Efficient Solution of Model-Predictive Control for Urban Traffic Networks Considering Endpoint Penalties", Proceedings of the 2015 IEEE 18th International Conference on Intelligent Transportation Systems, Las Palmas de Gran Canaria, Spain, pp. 2837-2842, Sept. 2015.

5. A. Jamshidnejad, B. De Schutter, M. Mahjoob, "Urban Traffic Control Using a Fuzzy Multi-Agent System", Proceedings of the 2015 European Control Conference (ECC), Linz, Austria, pp. 3046-3051, July 2015.

4. A. Jamshidnejad, B. De Schutter, "An Iterative Procedure for Estimating the Generalized Average Speed Using Microscopic Point Measurements", Proceedings of the 2015 Models and Technologies for Intelligent Transportation Systems (MT-ITS), Budapest, Hungary, pp. 38-44, June 2015.

3. A. Jamshidnejad, B. De Schutter, "A Multi-Objective Model-Predictive Control Approach Dealing with Congestion and Emissions in Urban Traffic Networks", Proceedings of the 2015 ARTS ECR, La Valletta, Malta, 6 pp., May 2015.

2. A. Jamshidnejad, M. J. Mahjoob, "Urban Traffic Fuzzy Prototypes Using a Graph-Based Two-Stage Clustering Algorithm", Proceedings of the 2nd International Conference on Control, Instrumentation, and Automation (ICCIA 2011), Shiraz, Iran, pp. 102-105, Dec. 2011.

1. A. Jamshidnejad, M. J. Mahjoob, "Traffic Simulation of an Urban Network System Using Agent-Based Modeling", Proceedings of the IEEE Colloquium on Humanities, Science and Engineering Research (CHUSSER 2011), Penang, Malaysia, pp. 300-304, Dec. 2011.

TEACHING EXPERIENCE

- MSc Course Assistance for "Control Theory" including lectures, 2015
- MSc Course Assistance for "Modeling and Nonlinear Systems Theory", 2014
- MSc Course Assistance for "Knowledge-Based Control Systems", 2014
- BSc Course "Dynamics and Vibrations" (private lecturing), 2006
- BSc Course "Physics" (private lecturing), 2006

RESEARCH VISITS

- University of California Berkeley, Institute of Transportation Studies, Group of Professor Alexandre Bayen, Berkeley, USA, October–November 2016
- Shanghai Jiao Tong University, Department of Automation, Group of Professor Yugeng Xi, Shanghai, China, June 2016
- Technical University of Crete, Dynamic Systems and Simulation Laboratory, Group of Professor Markos Papageorgiou, Chania, Greece, May–June 2015

INVITED TALKS (IN ADDITION TO CONFERENCE TALKS)

- ETH Zürich, Automatic Control Laboratory, Zürich, Switzerland, May 17, 2017
  Title: Efficient Predictive Model-Based and Fuzzy Control Approaches for Nonlinear Systems

- KTH Royal Institute of Technology, Stockholm, Sweden, May 12, 2017
  Title: Efficient Control Approaches for Green Urban Mobility

- ETH Zürich, Institute for Dynamic Systems and Control, Zürich, Switzerland, February 3, 2017
  Title: Efficient Predictive Model-Based and Fuzzy Control for Green Urban Mobility

- University of California Berkeley, Institute of Transportation Studies, Berkeley, US, November 8, 2016
  Title: Predictive Model-Based and Fuzzy Control for Urban Traffic

- Shanghai Jiao Tong University, Department of Automation, Shanghai, China, June 8, 2016
  Title: MPC with Endpoint Penalties for Congestion and Emission Control in Urban Traffic Networks
- Shanghai Jiao Tong University, Department of Automation, Shanghai, China, June 9, 2016
  Title: Urban Traffic Control using a Fuzzy Multi-Agent System
- Tongji University, Shanghai, China, June 14, 2016
  Title: MPC Controllers for Reduction of Congestion and Emissions
- Special Interest Session (SIS) at the ITS World Congress on Self-Management of Traffic Networks, Bordeaux, France, October 7, 2015
  Title: Model-Predictive Control for Urban Traffic Networks
- Technical University of Crete, Dynamic Systems and Simulation Laboratory, Chania, Greece, June 25, 2015
  Title: A Multi-Objective MPC Controller for Sustainable Urban Traffic Networks
- Uppsala University, Department of Information Technology, Uppsala, Sweden, April 10, 2013
  Title: Multi-Agent Fuzzy Control of Urban Traffic Networks

LOCAL PRESENTATIONS

- Final Project Meeting: The Application of Operations Research in Urban Transport, Amsterdam, The Netherlands, September 8, 2016
  Title: Multi-Level Predictive Traffic Control for Large-Scale Urban Networks
- DCSC Lunch Colloquium, Delft University of Technology, Delft Center for Systems and Control, Delft, The Netherlands, January 20, 2016
  Title: Model-Predictive Control for Green Mobility in Urban Traffic Networks
- Project Progress Meeting: The Application of Operations Research in Urban Transport, Utrecht, The Netherlands, October 20, 2014
  Title: Multi-Level Predictive Traffic Control for Large-Scale Urban Networks
- TrafCon Meeting, Delft Center for Systems and Control and Operations & Management of Transport Systems, Delft, The Netherlands, September 5, 2014
  Title: Estimation of Traffic Average Speed Based on Microscopic Measurements
- 33$^{\text{rd}}$ Benelux Meeting on Systems and Control, Nijmegen, The Netherlands, March 26, 2014
  Title: Multi-Level Predictive Traffic Control for Large-Scale Urban Networks

POSTER PRESENTATION

- Special Interest Session (SIS) at the ITS World Congress on Self-Management of Traffic Networks, Bordeaux, France, Oct. 2015
  Poster: MPC-Based Congestion and Emission reduction in Urban Traffic Networks

SCIENTIFIC ACTIVITIES

- Organized the TrafCon meetings between the PhD students and staff members of Delft Center for Systems and Control group and the Operations & Management of Transport Systems group of Delft University of Technology, 2014–2016
- Chair of the "Traffic Control" session in the 18$^{\text{th}}$ International IEEE Conference on Intelligent Transportation Systems, Las Palmas de Gran Canaria, Spain, September 18, 2015
- Member of 6 MSc thesis committees at the Delft Center for Systems and Control, Delft University of Technology, and the Operations and Management of Transport Systems, Delft University of Technology

REVIEW ACTIVITIES

- **JOURNALS**
  Automatica, Transportation Research Part C, Transportation Research Part D, IEEE Transactions on Intelligent Transportation Systems

- **CONFERENCES**
  European Control Conference, IEEE Conference on Automation Science and Engineering, IFAC World Congress, IEEE Intelligent Vehicles Symposium, IEEE International Conference on Automation Science and Engineering, Annual Meeting of the Transportation Research Board, IFAC Control in Transportation Systems, IEEE International Conference on Transportation Systems,

MSc and BSc Thesis Supervision

- Martin de Vette (MSc), Delft University of Technology, Delft Center for Systems and Control (April 2015–December 2017)
  Title: Comparison of Model-Predictive Control Approaches in Urban Traffic Networks for Sustainable Mobility

- Emmanuele Boerci (MSc), Visiting student from University of Pavia, (March 2016–July 2016)
  Title: Bi-Level Model-Predictive Control with Time Decomposition for Green Urban Mobility

- Rob van Kooten, Pieter Imhof, Karst Brummelhuis, Maurits van Pampus (BSc), Delft University of Technology, Delft Center for Systems and Control (January 2017–April 2017)
  Title: ART-UTC: An Adaptive Real-Time Urban Traffic Control Strategy*

  * *This project has resulted in one published international conference paper.*

Computer Skills

Matlab, LaTeX, NetLogo, Solidworks, SUMO

Honors & Awards

- Selected as one of the three final candidates for receiving the DEWIS PhD thesis award for the best PhD female candidate of Delft University of Technology in 2016-2017
- Best presentation award at ARTS ECR Conference, La Valletta, Malta (organized within the framework of the European COST action ARTS), May 2015
- Ranked 292 in nationwide university entrance exam among almost 400 000 participants, 2004
- Awarded "Elite Student" facilities as a result of the BSc entrance exam, 2004
- Selected for the 1st level of the Math Olympiad competition, 2002
- Selected for the 1st level of the Chemistry Olympiad competition, 2002
- Selected for the 1st level of the Literature Olympiad competition, 2002

Grants

- Individual Niels Stensen grant of 48 228 EUR tax-free (success rate: 12%) for 1 year of postdoctoral research at ETH Zürich, Institute for Dynamic Systems and Control, Zürich, Switzerland
- Travel grant of 2 500 EUR for visit to the group of Prof. Markos Papageorgiou, Dynamic Systems & Simulation Laboratory, Technical University of Crete, Chania, Crete, May 1, 2015–June 30, 2015, awarded by the European COST action ARTS
- Travel costs for the "Mobility Summer School on Safe & Sustainable Transport", 2014, awarded by IDEA League (http://idealeague.org), which is a network of 5 leading European Universities of Science and Technology: Delft University of Technology, RWTH Aachen, ETH Zürich, Chalmers University, and Politecnico di Milano (approximately 20 students across Europe were selected for the summer school)

Hobbies

Painting; Playing piano and santur; Composing poems (I have published a book in 2006); Writing short stories for children (I have published a cartoon book for children in 2010)