Mohammad Ali Arman

Doctor of Philosophy in Engineering Science, Traffic, and Transportation

CURRENT EMPLOYMENT

Research Associate (January 2024 so far)
Katholieke Universiteit Leuven
Industrial Management/Traffic and Infrastructure (CIB),
Arenberg, Celestijnenlaan 300, 3001 Leuven
Email: mohammadali.arman@kuleven.be

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Scholar Profile: https://scholar.google.com/citations?user=NEgermQAAAAJ&hl=en&oi=ao
ResearchGate Profile: http://www.researchgate.net/profile/Mohammad_Ali_Arman
Personal Website: https://maarman.github.io/

HONORS

- Accepted as the National Exceptional Talent by the Iran National Elite Foundation, 2013.
- Graduated as a **distinguished student** in master of transportation engineering, 2012.
- Writer and presenter of best paper in Traffic Flow Theory panel in 12th International Conference on Traffic and Transportation Engineering in Tehran (2013).

RESEARCH INTERESTS

Data Analysis: Data fusion, Data mining, Statistical inference, Application of AI in data science.

Traffic Flow Studies: Empirical analysis, Studying and analysing trajectory data, Lane-changing analysis and modelling, Traffic state estimation, Microsimulation.

Travel Behaviour Analysis: Discrete choice analysis and modelling, Demand analysis, Supply-demand equilibrium, Simulation.

JOURNAL PAPERS

- **Published:**

Arman, M. A., Tampère, C.M J. (2023). Empirical Study of Lane-Changing Maneuvers in a Weaving Area Based on Reconstructed Trajectories of Floating Car Data. Transportation Research Record (TRR), Journal of the Transportation Research Board, doi: 10.1177/03611981231179474.

Arman, M. A., Tampère, C.M J. (2022). Lane-level trajectory reconstruction based on data-fusion. Transportation Research Part C-Emerging Technologies, 145, Art.No. 103906. doi: 10.1016/j.trc.2022.103906.

Arman, M. A., Tampère, C.M J. (2021). Lane-level routable digital map reconstruction for motorway networks using low-precision GPS data. Transportation Research Part C-Emerging Technologies, 129, Art.No. 103234. doi: 10.1016/j.trc.2021.103234.

Arman, M. A., Khademi, N., and de Lapparent, M. (2018). Women's mode and trip structure choices in daily activity-travel: a developing country perspective. Transportation Planning and Technology, 41 (8), 845-877. doi: 10.1080/03081060.2018.1526931.

Arman, M. A., N. Kalantari. and Mohammadian, A. (2015) Joint Modelling of Household Vehicle and Activity Allocation: Statistical analysis and discrete choice modelling approach. Transportation Research Record (TRR), Journal of the Transportation Research Board, No. 2495 on pages 121–130, doi: 10.3141/2495-13.

Zargari, S. A., **Arman, M. A**., and Kalantari, N. (2013). An Ant Colony System Algorithm for the Time Dependent Network Design Problem. International Journal of Optimization in Civil Engineering, 3(4), p. 511-526.

- **Under review:**

Arman, M. A., Tampère, C.M J. (2024). Traffic Flow Crystallization method for trajectory approximation and lane change inference. IEEE Intelligent Transportation Systems Transactions, (*under review*).

Arman, M. A., Tampère, C.M J. (2024). A multi-class macroscopic lane-change prediction model for weaving areas. Transportation Research Part C-Emerging Technologies. (*under review*).

Wens, M., **Arman, M. A.**, Tampère, C., Vansteenwegen, P. (2024). Strategic Lane Changing Behaviour in a Multi-Class, Complex Highway Setting. European Journal of Operational Research. (*under review*).

Notelaers, L., **Arman, M. A.**, Tampère, C.M J. (2024). A Stated Preferences Analysis of Shared Automated Vehicles as a Complementary Semi-Public Mode. Journal of Transport Geography. (*under review*).

Rafe, A., **Arman, M. A.**, Singleton, P. A. (2024). Exploring the Determinants of Pedestrian Crash Severity: A Comparative Study Using Ordered Probit, Stacking Ensemble, and TabNet. Data Science for Transportation. (*under review*).

PEER REVIEWED CONFERENCE PAPERS

Notelaers, L., **Arman, M. A.**, Tampère, C.M J. (2024). Stated Preferences on Shared Automated Vehicles in the Context of Mode Choice Model Estimation for Different Trip Purposes A Case Study for Flanders, Belgium. In: Transportation Research Board 103rd Annual Meeting, Washington DC, USA.

Rezaie, N., **Arman, M. A.**, van der Heide, A., Tampère, C.M J. (2024). Trajectory Reconstruction Using Reinforcement Learning. In: Transportation Research Board 103rd Annual Meeting, Washington DC, USA.

Rafe, A., **Arman, M. A.**, Singleton, P. A. (2024). An In-depth Investigation into Factors Influencing Pedestrian Crash Severity: Comparative Analysis of Ordered Probit, Stacking Ensemble Model, and TabNet. In: Transportation Research Board 103rd Annual Meeting, Washington DC, USA.

Arman, M. A., Tampère, C.M J. (2023). Accurate Segment Travel Time Estimation Based on Individual Vehicle Data. Presented at 26th IEEE International Conference on Intelligent Transportation Systems (IEEE-ITSC-2023), Bilbao, Bizkaia, Spain, 24-28 Sep 2023.

Arman, M. A., Tampère, C.M J. (2023). Inference of Lane-Change Maneuvers of the Whole Traffic Flow Based on Individual Vehicle Data. In: Traffic Flow Theory and Characteristics Committee Summer meeting (ACP50). Presented at TFTC-2023, Amsterdam, The Netherlands, 26-28 Jul 2023.

Arman, M. A., Himpe, W., Tampère, C.M J. (2023). Trajectory Approximation of the Full Traffic Flow Based on Double Loop Detector Data. In: TRB committee ACP80 Standing Committee on Traffic Simulation, (Paper No. 23-02527). Presented at the Transportation Research Board 102nd Annual Meeting, Washington DC, USA, 08-12 Jan 2023.

Arman, M. A., Tampère, C.M J. (2023). An Empirical Study of Lane-Changing Maneuvers in a Weaving Area Based on High Resolution Floating Car Data. In: TRB committee ACP50 Standing Committee on Traffic Flow Theory and Characteristics, (Paper No. 23-00488). Presented at the Transportation Research Board 102nd Annual Meeting, Washington DC, USA, 08-12 Jan 2023.

Wens, M., **Arman, M. A.**, Abuamer, I. M A., Tampère, C., Vansteenwegen, P. (2023). Differences in Optimised Trajectories Under Selfish and collaborative Behaviour of multi-class Freeway Traffic. Presented at International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS 2023), Nice, France, 14-16 June 2023, doi: 10.1109/MT-ITS56129.2023.10241634.

Wens, M., **Arman, M. A.**, Abuamer, I. M A., Tampère, C., Vansteenwegen, P. (2022). Optimising highway vehicle trajectories with a MILP; case study on the ring of Antwerp. (40-41). Presented at the 36th Annual Conference of the Belgian Operations Research Society (ORBEL), Gent, Belgium, 12-13 Sep 2022.

Arman, M. A., Tampère, C.M J. (2022). Empirical Analysis of Lane Changing Maneuvers in Motorway Weaving Area. In: hEART 2022. Presented at the hEART 2022: 10th Symposium of the European Association for Research in Transportation, KU Leuven, Leuven, Belgium.

Arman, M. A., Tampère, C.M J. (2020). Road centreline and lane reconstruction from pervasive GPS tracking on motorways. Presented at the 11th International Conference on Ambient Systems, Networks and Technologies (ANT) / 3rd International Conference on Emerging Data and Industry 4.0 (EDI), Warsaw, Poland, 06-09 Apr 2020. doi: 10.1016/j.procs.2020.03.086.

Arman, M. A., Khademi, N., de Lapparent, M., Saedi, R. (2019). Activity-Travel Analysis of Women in a Patriarchal Society with Strong Gender Norms. In: Women's Issues in Transportation, (Paper No. 19-00821). Presented at the Transportation Research Board 98th Annual Meeting, Washington DC, United States, 13-17 Jan 2019.

Arman, M. A., Rafe, A. & Kretz, T. (2015) Pedestrian Gap Acceptance Behaviour, A Case Study: Tehran. In: TRB committee ANF10 Pedestrians., (Paper No. 15-2217). Presented at the Transportation Research Board 94th Annual Meeting, Washington DC, United States, 11-15 Jan 2015.

Arman, M. A. & Kalantari, N. (2014). Joint Modelling of Shopping Mode and Destination Choice - Case Study of Mashhad. In 13th International Conference of Traffic and Transportation Engineering, Tehran, Iran.

Arman, M. A., Kalantari, N. (2013). Statistical and Analytical Modelling of Children's Travel Behaviour: Some Evidence on the Cultural Effects. In: TRB committee ADB10 Traveller Behaviour and Values, (Paper No. 13-3669). Presented at the Transportation Research Board 92nd Annual Meeting, Washington DC, United States, 13-17 Jan 2013.

Mohaymany, A. S., **Arman, M. A.**, & Kalantari N. (2013). Estimation of the distribution function of vehicles' headway in different traffic facilities of Tehran. In: The 12th International Conference on Transportation and Traffic Engineering, Tehran, Iran.

Zargari, S. A., **Arman, M. A.**, & Kalantari N. (2012). Time-Dependent Transportation Network Design Considering Land-Use and Equity Issue between Landowners. In the 9th International Congress on Civil Engineering, Isfahan, Iran.

ACADEMIC BOOKS

Simulation, Calibration and Validation with Aimsun, Publisher: Avaye Fahim, 2011, ISBN: 978-600-6810-12-6 (in Persian, author of 3 out of 6 chapters).

Manual of using Traffic Simulation Software in Tehran, Publisher: Avaye Fahim, 2011, ISBN: 978-600-6810-13-3 (in Persian, author of 2 out of 5 chapters).

Pedestrian Flow Modelling and Simulation in Tehran, Publisher: Department of Transportation and Traffic Organization of Tehran Municipality, 2013 (in Persian, author of 3 out of 8 chapters).

ACADEMIC CERTIFICATES

Teacher Training Faculty of Engineering Science, 2021, SWEET^2, KU Leuven.

Central Lecture Research Integrity, 14 January 2021, KU Leuven.

Discrete Choice Analysis: Predicting Demand and Market Shares, 20-24 March 2016, Transport and Mobility Laboratory, EPFL, Switzerland.

TEACHING ACTIVITIES

Transportation Systems Analysis (B-KUL-H0A07A) (2023, one semester), Basic discrete choice analysis module, 3 sessions teaching + 3 sessions exercise per semester, KU Leuven.

Transport Models (B-KUL-H0T95A) (2020-2023, three semesters), Advanced discrete choice analysis module, 3 sessions teaching + 3 sessions exercise per semester, KU Leuven.

Intelligent Transportation Systems (B-KUL-H00M8B) (2020-2023, four semesters), 13 exercise sessions per semester, KU Leuven.

Traffic Engineering (B-KUL-H0A07A) (2020-2022, three semesters), Basic discrete choice analysis module, 3 sessions teaching + 3 sessions exercise per semester, KU Leuven.

Supply Chain Engineering (B-KUL-H08J0A) (2020-2023, four semesters), 3 exercise sessions per semester, KU Leuven.

Statistics and Probability in Transportation Engineering (2012-2015, four semesters), 6 exercise sessions per semester, Iran University of Science and Technology.

Computer Application in Transportation Supply and Demand Modelling (focusing on micros and macro simulation), (2017-2018, five workshops over a two-year period), 16 hours per workshop, University of Tehran.

RESEARCH MENTORING

For postgraduate students Gwynne van Kaauwen (2020-2021), Master's Thesis Title: Multi-objective optimization for traffic signal control.
For postgraduate students Lotte Notelaers (2020-2021), Master's Thesis Title: Shared Automated Vehicle Services in Multimodal Network Simulation.
For postgraduate students Maarten Wens (2021-2022), Master's Thesis Title: Unravelling Interlocking Vehicle Trajectories Towards Antwerp's Largest Bottleneck.
For postgraduate students Nikzad Rezaie (2022-2023), Master's Thesis Title: Trajectory Reconstruction Using Reinforcement Learning.

SERVICES

Reviewing for Scholarly Journals:

- IEEE Intelligent Transportation Systems Transactions
- Data Science for Transportation
- GIScience & Remote Sensing

Reviewing for International Conferences:

- Transportation Research Board (TRB)
- IEEE International Conference on Intelligent Transportation Systems (IEEE-ITSC)
- Symposium of the European Association for Research in Transportation (hEART)

Conference Program Committees:

- hEART-2022
- BIVEC-GIBET-2023

LANGUAGE PROFICIENCY

English (C1: Proficient user - Advanced)

COMPUTER SKILLS

Python Programming
Machine Learning Programming (PyTorch)
Cloud Programming (AWS)
R Programming
PTV Software package (Vissim, Viswalk, Visum)
TSS-Aimsun
SUMO (Open-source Simulation of Urban Mobility)
QGIS