IMAN AGHAYAN, Ph.D.

CONTACT INFORMATION

Academic Title:

Associate Professor of Civil Engineering Department at Shahrood University of Technology, Shahrood, Iran
E-mail: iman.aghayan@shahroodut.ac.ir

EDUCATION

Doctor of Philosophy
Transportation Engineering (Sep. 2009 - Jan. 2013)

Traffic Education and Research Center, Department of Civil Engineering, Eastern Mediterranean University, North Cyprus

(GPA: 4.0/4.0-Ranked as the TOP student)

Dissertation Topic: *Improved Traffic Crash Modeling through Accuracy and Response Time Using Classification Algorithms: A Model Comparison Approach*

Master of Science
Transportation Engineering (Sep. 2006 - Jan. 2009)

Department of Civil Engineering, Khajeh Nasir Toosi University of Technology, Tehran, Iran

(GPA: 3.64/4.0-Ranked as the TOP student)

Bachelor of Science
Civil Engineering (Jan. 2001- Sep. 2005)

Department of Civil Engineering, Shahrood University of Technology, Shahrood, Iran

(GPA: 3.1/4.0-Ranked among 10 TOP students)

High School Diploma
National Organization for Development of Exceptional Talents, Shahrood, Iran (GPA: 3.6/4.0)

RESEARCH INTERESTS

- Traffic Accident Analysis, Intelligent Transportation Systems, Traffic Surveys and Simulation, Transport Planning and Traffic Forecasting, Transport Network Modeling, and Reliability Analysis
- Pavement Design, Pavement Management System
- Railway Engineering
- Air Pollution Modeling
- Evolutionary Algorithms, Stochastic Optimization, and Sensitivity Analysis Methods
- Finite Element Analysis, Progressive Collapse Analysis

JOURNAL PUBLICATIONS

International refereed journals

1. Samadi, H., **Aghayan, I**., Shaaban, K., Hadadi, F. (2023). *"Development of performance measurement models for two-lane roads under vehicular platooning using conjugate Bayesian analysis"*, <u>Sustainability</u> (Accepted).

2. Mirzamojeni, M., **Aghayan, I**, Behzadian, R. (2023). *"Evaluation of field aging effect on self-healing capability of asphalt mixtures"*, <u>Construction and Building Materials</u>, 369.

3. Rahmani, O., Abdollahzadeh Nasiri, A. S., **Aghayan, I**. (2023). *"The Effect of the Number of Right-Turn and Left-Turn Lanes on the Performance of Undersaturated Signalized Intersections"*, <u>Journal of Advanced Transportation.</u>

4. Bahrami Torkashvand, M., **Aghayan, I**., Qin, X., Hadadi, F. (2022). *"An extended dynamic probabilistic risk approach based on surrogate safety measure for rear-end collisions on two-lane roads"*, <u>Physica A: Statistical Mechanics and its Applications,</u> 603.

5. Khodanazari, H., Choupani, A.A., **Aghayan, I**. (2022). *"The Contribution of Walking to School in Students' Physical Activity and Its Effect on Being Overweight"*, <u>BioMed Research International,</u> 2022.

6. Gholizadeh, M., **Aghayan, I.** Hadadi, F. (2022). *"Modeling dynamic frequency response on slab track of Shinkansen railway based on finite element method"*, <u>Advances in Civil Engineering,</u> 2022.

7. Ataei, S.M., **Aghayan, I.**, Pouresmaeili, M.A., Babaie, M., Hadadi, F. (2022). *"The emission factor adjustments of the passenger cars in multi-story car parks under drive modes"*, <u>Environmental Science and Pollution Research</u>, 29, 5105-5123.

8. Ganjali Khosrowshahi, A., **Aghayan, I.**, Kunt, M., Choupani, A.A. (2021). *"Detecting crash hotspots using grid and density-based spatial clustering"*, <u>Proceedings of the Institution of Civil Engineers – Transport</u>, (Accepted).

9. Rezaei, D., **Aghayan, I**., Hadadi, F. (2021). *"Studying perturbations and wave propagations by lane closures on traffic characteristics based on a dynamic approach"*, <u>Physica A: Statistical Mechanics and its Applications,</u> 566.

10. **Aghayan, I.,** Khafajeh, R., Shamsaei, M. (2021). *"Life cycle assessment, mechanical properties, and durability of roller compacted concrete pavement containing recycled waste materials"*, <u>International Journal of Pavement Research and Technology</u>, 14, 595-606.

11. Sadeghi, M., **Aghayan, I.**, Ghaznavi, M. (2021). *"A cuckoo search based approach to design sustainable transit network"*, Transportation Letters, 13(9), 635-648.

12. Dabiri, A. R., **Aghayan, I**., Hadadi, F. (2021). *"A comparative analysis of the performance of turbo roundabouts based on geometric characteristics and traffic scenarios"*, Transportation Letters, 13(9), 674-685.

13. Khormani, M., Kalat Jaari, V.R., **Aghayan, I.,** Ghaderi, S.A., Ahmadyfard, A. (2020). *"Compressive strength determination of concrete specimens using x-ray computed tomography and finite element"*, Construction and Building Materials, 256.

14. Shamsaei, M., Khafajeh, R., Ghasemzadeh Tehrani, H., **Aghayan, I.** (2020). *"Experimental evaluation of ceramic waste as filler in hot mix asphalt"*, Clean Technologies and Environmental Policy, 22, 535-543.

15. Mohammadian Nameghi, I., **Aghayan, I.**, Behzadian R., Mosaberpanah, M.A. (2020). *"Investigating the effect of using cross-linked polyethylene waste as fine aggregate on mechanical properties of hot mix asphalt"*, International Journal of Transportation Engineering, 7(3), 233-247.

16. Shahikhaneh, A., Ahmadi Azari, K., **Aghayan, I.** (2020). *"Modeling the transport mode choice behavior of motorcyclists"*, Iranian Journal of Science and Technology, Transactions of Civil Engineering, 44, 175-184.

17. Najmi, A., Choupani, A.A., **Aghayan, I.** (2019). *"Characterizing the driver behavior in dilemma zones at signalized roundabouts"*, Transportation Research Part F: Psychology and Behaviour, 63, 204-215.

18. Taghizadeh, S.A., Shafabakhsh, G., **Aghayan, I.** (2019). *"Evaluation of aircraft emission at Imam Khomeini International Airport and Mehrabad International Airport"*, International Journal of Environmental Science and Technology, 16, 6587-6598.

19. Noii, N., **Aghayan, I.** (2019). *"Characterization of elastic-plastic coated material properties by indentation techniques using optimisation algorithms and finite element analysis"*, International Journal of Mechanical Sciences, 152: 465-480.

20. Shamsaei, M., Khafajeh, R., **Aghayan, I.** (2019). *"Laboratory evaluation of the mechanical properties of roller compacted concrete pavement containing ceramic and coal waste powders"*, Clean Technologies and Environmental Policy, 21, 707-716.

21. Pouresmaeili, M.A., **Aghayan, I.,** Taghizadeh, S.A. (2018). *"Development of mashhad driving cycle for passenger car to model vehicle exhaust emissions calibrated using on-board measurements"*, Sustainable Cities and Society, 36, 12-20.

22. Tazik, M., **Aghayan, I.**, Sadeghi, M. (2017). *"Application of multiple logistic regression, bayesian logistic and classification tree to identify the significant factors influencing crash severity"*, <u>Journal of Engineering Science and Technology</u>, 12(11), 3044-3056.

23. Shamsaei, M., **Aghayan, I.**, Akhavan Kazemi, K. (2017). *"Experimental investigation of using cross-linked polyethylene waste as aggregate in roller compacted concrete"*, <u>Journal of Cleaner Production</u>, 165, 290-297.

24. Pourzahedi, S., **Aghayan, I**. (2017). *"An analysis of seismic behavior of two non-coplanar tunnels"*, <u>Engineering Journal</u>, 21(2), 199-211.

25. Hatami, H., **Aghayan, I**. (2017). *"Traffic efficiency evaluation of elliptical roundabout compared with modern and turbo roundabouts considering traffic signal control"*, <u>PROMET Traffic & Transportation</u>, 29(1), 1-11.

26. Jalali Larijani, R., Dashti Nasserabadi, H., **Aghayan, I.** (2017). *"Progressive collapse analysis of buildings with concentric and eccentric braced frames"*, <u>Structural Engineering and Mechanics</u>, 61(6), 755-763.

27. Noii, N., **Aghayan, I.**, Hajirasouliha, I., Kunt, M. (2017). *"A new hybrid method for size and topology optimization of truss structures using modified ALGA and QPGA"*, <u>Journal of Civil Engineering and Management</u>, 23(2), 252-262.

28. Saeidi, H., **Aghayan, I**. (2016). *"Investigating the effects of aging and loading rate on low-temperature cracking resistance of core-based asphalt samples using semi-circular bending test"*, <u>Construction and Building Materials</u>, 126, 682-690.

29. Nasaj Moghadam, H., Keyhani, A., **Aghayan, I.** (2016). *"Modelling of crack propagation in layered structures using extended finite element method"*, <u>Civil Engineering Journal</u>, 2(5), 180-188.

30. **Aghayan, I.,** Hadji Hosseinlou, M., Kunt, M. (2015). *"Application of support vector machine for crash injury severity prediction: A model comparison approach"*, <u>Civil Engineering and Urbanism</u>, 5(5), 193-199.

31. Jalali Larijani, R., Celikag, M., **Aghayan, I**., Kazemi, M. (2013). *"Progressive collapse analysis of two existing steel buildings using a linear static procedure"*, <u>Structural Engineering and Mechanics</u>, 48(2), 207-220.

32. Kazemi, M., Kunt, M., **Aghayan, I**., Jalali Larijani. R. (2013). *"Optimization model for fire station location based on GIS and Python: A case study in North Cyprus"*, <u>Applied Mechanics and Materials</u>, Vol. 330, 1059-1064.

33. **Aghayan, I**., Noii, N., Kunt, M. (2012). *"Extended traffic crash modeling through precision and response time using fuzzy clustering algorithms compared with multi-layer perceptron*", PROMET Traffic & Transportation, 24(6), 455-467.

34. Kunt, M., **Aghayan, I**., Noii, N. (2011). *"Prediction for traffic accident severity: comparing the artificial neural network, genetic algorithm and combined genetic algorithm and pattern search methods"*, Transport, 26(4), 353–366.

SUBMITTED TO JOURNAL

1. Rahmani, O., **Aghayan, I**., Kane, M., Abdollahzadeh Nasiri, A.S., Hadadi, F. (2022). *"A Nonlinear Analytical Approach for Estimating Vehicle Braking Distance Based on Multi-Body Dynamic Simulation"*, (Under review).

National refereed journals

1. Jahanshahi, R., **Aghayan, I**., Choupani, A.A. (2021). *"Monte Carlo's simulation to measure the uncertainty of travel demand and examining the impact of quasi-random number generators"*, Journal of Transportation Engineering (In Persian).

2. Baghani, H., Hosseini, S.A., **Aghayan, I.** (2021). *"Experimental evaluation of the effects of crack relief interlayer on the fracture properties of asphalt mixtures"*, Journal of Transportation Infrastructure Engineering, 6(4), 57-81 (In Persian).

3. Jalali Larijani, R., Dashti Nasserabadi, H., **Aghayan, I**. (2021). "*Progressive collapse investigation of buildings with concentric and eccentric braced frames using nonlinear procedure"*, Journal of Structural and Construction Engineering, 8(1) (In Persian).

4. Kharrazian, E., **Aghayan, I.**, Choupani, A.A., Mohammadi, A. (2021). "*Passenger car equivalent (pce) of regular buses at signalized intersections under saturated and over-saturated flow regimes"*, Journal of Transportation Engineering , 12(3), 649-667 (In Persian).

5. **Aghayan, I.**, Mohammadian Nameghi, I., Danandeh A., Behzadian R. (2020). *"Experimental investigation of the use of recycled cross-linked polyethylene as aggregate in porous asphalt mixture"*, Journal of Transportation Engineering (In Persian).

6. Razavian, E., **Aghayan, I.,** Hadadi, F. (2020). *"Analysis and modeling of delay time for turbo and modern roundabouts",* Journal of Transportation Engineering , 11(3), 757-771 (In Persian).

7. Khalili, H., **Aghayan, I.**, Hadadi, F. (2018). *"Evaluation of drivers᾿ behavior in one-way developed u-turns",* Road journal (In Persian).

8. Gholizadeh, M., **Aghayan, I.** (2017). *"3D modeling of slab track to study track frequency response"*, <u>Journal of Transportation Infrastructure Engineering</u>, 3(2), 111-128 (In Persian).

9. Mir, A., Aminian, P., **Aghayan. I.** (2016). *"Determining the potential of HMA mixtures containing polymeric and mineral additives against moisture damage"*, <u>Journal of Transportation Infrastructure Engineering</u>, 2(2), 91-106 (In Persian).

BOOK CHAPTER

1. **Aghayan, I.**, Khafajeh, R. (2019). *"Recycling of PET in Asphalt Concrete"*. <u>Use of Recycled Plastics in Eco-efficient Concrete</u>, 269-285. Elsevier.

2. **Aghayan, I**., Noii, N., Kunt, M. (2013). "*Fuzzy C-means Clustering Based on Clustering Algorithms for Traffic Crash Data"*, Advances in Civil Engineering and Building Materials, 2013, Edited by Zhao, J., Taylor & Francis Group, London.UK-ISBN:978-0-203-388707-5-

CONFERENCE PUBLICATIONS

1. Ghahremani, M., **Aghayan, I**., (2021). "A review of the performance characteristics of ultra-thin concrete overlay on asphalt pavement", 12th International Congress on Civil Engineering, Ferdowsi University of Mashhad, Mashhad, Iran, July 12-14, 2021 (In Persian).

2. Choupani, A.A., Jahanshahi, J., **Aghayan, I.**, (2019). *"Sensitivity analysis of urban trip generation models: a case study of mashhad"*, 11th National Congress on Civil Engineering, Shiraz, Iran (In Persian).

3. Kharrazian, E., **Aghayan, I**., Choupani, A.A., Mohammadi, A., (2019). *"Determination of passenger car equivalent at signalized intersections based on control delay using synchro: case study of mashhad"*, 6th National Conference on Applied Research in Civil Engineering, Architecture and Urban Management, Tehran, Iran (In Persian).

4. Khodanazari, H., Choupani, A.A., **Aghayan, I**., (2019). *"Investigating the students active travels to schools and its effect on weight status"*, 6th National Conference on Applied Research in Civil Engineering, Architecture and Urban Management, Tehran, Iran (In Persian).

5. Khodanazari, H., Choupani, A.A., **Aghayan, I**., (2019). *"the effect of school type on students' non-motorized trips and body mass index",* 6th National Conference on Applied Research in Civil Engineering, Architecture and Urban Management, Tehran, Iran (In Persian).

6. Khosrowshahi, A.G., **Aghayan, I**., Choupani, A.A., (2017). *"Predicting the injury accident points of intra-urban areas using geographical information system and data mining techniques",* 5th National Conference on Applied Research in Civil Engineering, Architecture, and Urban Management, Tehran, Iran (In Persian).

7. Najmi Atarabadi, A., **Aghayan, I.**, Choupani, A.A., (2017). *"Studying dilemma zone at signalized roundabouts: case study of mashhad"*, 1st National Conference on Recent Advancements in Engineering and Planning, Ghazvin, Iran (In Persian).

8. Shahikhane, A., Ahmadi Azari, K., **Aghayan, I.** (2016). *"Mode choice for motorcycle riders using multinomial logit model"*, Accepted for presentation at 15th International Conference on Traffic and Transportation Engineering, Tehran, Iran (In Persian).

9. Saeidi, H., **Aghayan, I**. (2015). *"Experimental investigation of fracture toughness of asphalt mixture using semi-circular bending test",* 3rd International Congress on Civil Engineering, Architecture & Urban Development, Shahid Beheshti University of Tehran, Tehran, Iran, December 29-31, 2015 (In Persian).

10. Noii, N., **Aghayan, I**. (2012). *"Theoretical development of partial differential equations through finite element analysis"*, International Congress of Croatian Society of Mechanics 2012-7ICCSM.

11. Hadji Hosseinlou, M., **Aghayan, I**. (2009). "*Prediction of traffic accident severity based on fuzzy logic"*, 8th International Congress on Civil Engineering, Shiraz, Iran, May 11-13, 2009.

12. Keyhani, A., Hadji Hosseinlou, M., **Aghayan, I**. (2008). *"Application of fuzzy system in prediction of traffic accident severity"*, The Conference of Transport Research Arena Europe, Ljubljana, 2008.

HONORS & AWARDS

- Distinguished Educator Award, Shahrood University of Technology, 2020
- Distinguished Research Award, Shahrood University of Technology, 2017
- First Rank in Ph.D. program
- First Rank in M.Sc. program (1st among 12)
- First Rank in B.Sc. program (Second Semester 2004-2005)
- The cooperation with the local authority for traffic control in the framework of TSIP (traffic safety improvement program) funded by the EU (Ph.D. program)

ACADEMIC EXPERIENCES

- Associate Professor/Assistant Professor at Shahrood University of Technology
- Instructor at Eastern Mediterranean University (From 2011 to 2013)
- Research Assistant and Teaching Assistant at Eastern Mediterranean University (From 2009 to 2013)
- Teaching Assistant for Structural Analysis Course at Shahrood University of Technology (From 2003 to 2005)

JOURNAL REVIEWER

- PLOS ONE (Academic Editor- From 2022 to Present)
- The Open Transportation Journal (Editorial Board- From Mar. 2019 to Dec. 2020)
- Construction and Building Materials, Case Studies in Construction Materials, Sustainable Cities and Society, Physica A: Statistical Mechanics and its Applications, PROMET- Traffic & Transportation, Transportation Research Part C, International Journal of Pavement Engineering, Road Materials and Pavement Design, International Journal of Transportation Engineering, Arabian Journal for Science and Technology, Neural Computing and Applications, Journal of the Air & Waste Management Association, Scientia Iranica, SN Applied Sciences (SNAS), World Review of Intermodal Transportation Research (WRITR)

COURSES TAUGHT

- Eastern Mediterranean University:

Undergraduate Courses

CIVL361-Transportation Engineering

CIVI261- Surveying

CIVL211-Statics

- Shahrood University of Technology:

Undergraduate Courses

Transportation Engineering

Railway Engineering

Airport Engineering

Statics

Strength of Materials

Road Construction Project

Computer Programming

Graduate Courses

Advanced Traffic Engineering

Advanced Railway Engineering

Transportation Planning

Traffic Safety

Design and Analysis of Experiments

Computer Applications in Transportation Engineering

Ph.D. Courses

Advanced Transportation Planning

Urban Transportation Planning

Highway Capacity Analysis

Intelligent Transportation Systems

Special Topic in Transportation Engineering, Research in Road Safety

GRADUATE STUDENTS SUPERVISED (as Principal Supervisor)

1. *Evaluating the fracture resistance of core-based asphalt samples using semi-circular bending test,* (Hadi Saedi, February 2016)

2. *Performance evaluation of signalized and unsignalized elliptical roundabouts: A comparison approach*, (Hadi Hatami, February 2016)

3. *Analysis of railway tunnel under seismic and soil pressure loading,* (Sina Pourzahedi, February 2016)

4. *Analysis of traffic accident injury severity using Bayesian networks: A comparison approach,* (Milad Tazik, February 2016)

5. *3D modeling of slab track to study track frequency response,* (Majid Gholizadeh, September 2016).

6. *An extended finite element analysis for delamination and crack propagation in composite structures,* (Hesam Nasaj, September 2016)

7. *A delay model for modern and turbo roundabouts* (Elham Razavian, September 2016)

8. *Finite element model for deflection of concrete pavement at touchdown point caused by an aircraft during landing,* (Amir Hossein Hosseini, September 2016)

9. *Development of driving cycle for estimating urban air pollution: Case study of Mashhad,* (Mohammad Amin Pouresmaeili, September 2016)

10. *Performance comparison of turbo roundabouts in different geometric conditions,* (Amir Reza Dabiri, October 2016)

11. *Experimental investigation of recycled cross-linked polyethylene used as aggregate in roller compacted concrete pavement mixture,* (Mohsen Shamsaei, January 2017)

12. *Experimental investigation of recycled cross-linked polyethylene in Asphalt Mixture* (Iman Mohammadian Nameghi , January 2017)

13. *Identifying risk factors of injuries in pedestrian–vehicle crashes using clustering algorithms– Case study of Mashhad,* (Hassan Khodaparast, February 2017)

14. *Optimization of transit network design and frequencies setting using a metaheuristic approach,* (Mohsen Sadeghi, January 2018)

15. *Modeling dilemma zone at signalized roundabout* (Ahmad Najmi Oterabad, January 2018)

16. *"Study of the student travels patterns and its effect on Body Mass Index"* (Hemmat Khodanazari, January 2018)

17. *Determining the proportion of the exhaust emissions and presenting a calibrated emission model in multi-storey car parks* (Seyed Milad Ataei, January 2019)

18. *Sensitivity analysis of interurban travel demand models: A case study of Mashhad city* (Reza Jahanshahi, June 2019)

19. *Estimating the passenger car equivalent (PCE) in urban networks for undersaturated, saturated and over saturated flows* (Emadoddin Kharrazian, June 2019)

20. *Determining a spatial clustering method for crash data* (Amin Ganjali Khosrowshahi, June 2019)

21. *Calculating the impact factor at rail welding joint* (Tavakoli, January 2020)

22. *Estimating dynamic shockwaves based on lane changes in lane closures* (Danial Rezaei, January 2020)

23. *Evaluating the effect of overtaking behavior in vehicle platooning on time to collision in two-lane roads* (Mojtaba Bahrami Torkashvand, June 2021)

24. *Evaluation of moisture sensitivity of geosynthetics bonding with asphalt overlays,* (Amir Reza Paya, September 2021)

25. *Experimental investigation of the effects of aging on the long-term self-healing characteristics of asphalt mixtures* (Mohammadreza Mirzamojeni, June 2022)

GRADUATE STUDENTS SUPERVISED (as Co-Supervisor)

1. Modeling mode choice behavior for motorcycle riders, (Ali Shahikhaneh, September 2015)

RESEARCH PROJECTS

1. Laboratory evaluation of the mechanical properties of roller compacted concrete pavement containing ceramic and coal waste (Shahrood University of Technology; Grant No. 15027).

2. Developing a software tool for advanced traffic data interpretation considering the analysis of recorded videos (Shahrood University of Technology).

3. Construction of compactor device for asphalt mixtures (Shahrood University of Technology; Grant No. 3/150104).

4. Determining the road accident hotspots using clustering algorithms (Shahrood University of Technology).

5. Performance evaluation of cold mix asphalt plant with MC-250 bitumen and hot mix asphalt on asphalt pavement cracks (Shahrood University of Technology; Grant No. 50/5836).

6. Performance evaluation of cross-linked polyethylene waste in semi-flexible pavement (Shahrood University of Technology, Grant No. 50/29621).

INDUSTRIAL EXPERIENCES

- Research Project Coordinator at Civil Eng. Dept. of Shahrood University of Technology (From 2014 to 2021)

- Spilat Construction Company (From 2015 to 2021)
    - *Road safety engineer (Analyzing traffic accident data and identifying hot spot locations).*

- Shabdar Consulting Engineers (2008-2009)
    - *Transportation engineer (Determining the optimal bus stop locations).*

LANGUAGE

- English, Persian

COMPUTER SKILLS

- Traffic Software: AIMSUN, Synchro, HCS, CORSIM, ADAMS/rail, IVE
- Statistical & Computing Software: MATLAB, Civil 3D, ArcGIS, Python, R, SPSS