

## Educational Background

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- **Bachelor:** Karadeniz Technical University Geology and Civil Engineering Programme (with Double Major), 2005-10/12/2010.
- **M. Sc.:** İstanbul Technical University, Transportation Engineering, 2012- 23/01/2015.  
**Subject:** *Multivariate and Fuzzy Clustering Approaches to Dynamic Classification of Traffic Flow States*  
**Advisor:** Prof. Dr. Hilmi Berk Celikoglu
- **Ph. D.:** İstanbul Technical University, Transportation Engineering, 2015-18/03/2022.  
**Subject:** *Effects of Cooperative Vehicle Dynamics on Traffic Flow Control*  
**Advisor:** Prof. Dr. Hilmi Berk Celikoglu

## Publications

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- **M. A. Silgu,** "A Framework for Evaluating the Safety and Homogenizing Effect of Freeway Traffic Controllers on Mixed Traffic Conditions," *Arabian Journal for Science and Engineering*, 2023, pp. 1-16, doi: 10.1007/s13369-023-08321-7.
- **M. A. Silgu,** I. G. Erdagi, G. Göksu and H. B. Celikoglu, "Combined Control of Freeway Traffic Involving Cooperative Adaptive Cruise Controlled and Human Driven Vehicles Using Feedback Control Through SUMO," *IEEE Transactions on Intelligent Transportation Systems*, Vol. 23, No. 8, August 2022, pp.11011-11025, doi: 10.1109/TITS.2021.3098640.
- H.B. Celikoglu, **M. A. Silgu,** "Extension of Traffic Flow Pattern Dynamic Classification by a Macroscopic Model Using Multivariate Clustering", *Transportation Science*, Vol. 50, No. 3, August 2016, pp. 966-981, doi: 10.1287/trsc.2015.0653.
- Mauro Dell'Orco, Mario Marinelli, **M. A. Silgu,** "Bee Colony Optimization for innovative travel time estimation, based on a mesoscopic traffic assignment model", *Transportation Research Part C: Emerging Technologies*, Vol. 66, May 2016, pp. 48-60, doi:10.1016/j.trc.2015.10.001
- **M. A. Silgu,** I. G. Erdagi, G. Göksu and H. B. Celikoglu, "H $\infty$  State Feedback Controller for ODE Model of Traffic Flow", in *IFAC-PapersOnline*, Vol.54, No. 2, 2021, pp. 19-24, ISSN 2405-8963, doi:10.1016/j.ifacol.2021.06.003.
- G. Göksu, **M. A. Silgu,** I. G. Erdagi, and H. B. Celikoglu, "Integral Input-to-State Stability of Traffic Flow with Variable Speed Limit", in *IFAC-PapersOnline*, Vol.54, No. 2, 2021, pp. 31-36, ISSN 2405-8963, doi: 10.1016/j.ifacol.2021.06.005.
- **M. A. Silgu,** I. G. Erdagi., & H. B. Celikoglu (2020). Network-wide emission effects of cooperative adaptive cruise control with signal control at intersections. *Transportation Research Procedia*, 47, 545-552, doi: 10.1016/j.trpro.2020.03.130
- G. Akyol., I. G. Erdagi., **M. A. Silgu,** & H. B. Celikoglu (2020). Adaptive signal control to enhance effective green times for pedestrians: A case study. *Transportation Research Procedia*, 47, 704-711, doi: 10.1016/j.trpro.2020.03.150
- **M. A. Silgu** and H. B. Celikoglu, "K-means clustering method to classify freeway traffic flow patterns", *Pamukkale University Journal of Engineering Sciences*, Vol. 20, No. 6, September 2014, pp. 232- 239, doi: 10.5505/pajes.2014.36449

## Conference Papers

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- S. Goncu, **M.A. Silgu,** I.G. Erdagi, H.B. Celikoglu, "Evaluation of Vehicle Assignment Algorithms for Autonomous Mobility on Demand", *IEEE 2022 3rd Intelligent Vehicles Symposium*, 04-09Aachen, Germany, doi: 10.1109/IV51971.2022.9827456.
- S. Goncu, **M.A. Silgu,** H.B. Celikoglu, "Analysis on Effects of Driving Behavior on Freeway Traffic Flow: A Comparative Evaluation of Two Driver Profiles Using Two Car-Following Models", *IEEE 2022 3rd Intelligent Vehicles Symposium*, Aachen, Germany. doi: 10.1109/IV51971.2022.9827296
- S. Goncu, **M.A. Silgu,** I.G. Erdagi, H.B. Celikoglu, "Sensitivity Analysis for A Cooperative Adaptive Cruise Control Car Following Model: Preliminary Findings," Presented at the 18th International Conference on Computer Aided Systems Theory (EUROCAST2022), February 20-25, 2022, Las Palmas de Gran Canaria, Canary Islands, Spain.
- **M.A. Silgu,** I.G. Erdagi, S. Akti, S. Hulagu, H. Akova, G. Goksu, H.B.Celikoglu, "A Methodology to Consider Explicitly Emissions in Dynamic User Equilibrium Assignment," Presented at the 18th International Conference on Computer Aided Systems Theory (EUROCAST2022), February 20-25, 2022, Las Palmas de Gran Canaria, Canary Islands, Spain.
- S. Akti, I.G. Erdagi., **M. A. Silgu,** & Celikoglu, H. B. (2020, September). A Game-Theoretical Approach for Lane-Changing Maneuvers on Freeway Merging Segments. In *2020 IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC)*, (pp. 1-6). IEEE.
- G. Akyol, I.G. Erdagi, **M.A. Silgu,** H.B. Celikoglu, "An Adaptive Signal Control Approach to Enhance Effective Green Times for Pedestrians: A Case Study", 22nd EURO Working Group on Transportation Meeting, EWGT 2019, Barcelona, 18.09.2019-20.09.2019
- **M.A. Silgu,** I.G. Erdagi, H.B. Celikoglu, "Emission Effects of Cooperative Adaptive Cruise Control: A Simulation

Case Using SUMO”, SUMO User Conference, Berlin, 13.05.2019-15.05.2019

- G. Akyol, **M.A. Silgu**, H.B. Celikoglu, “Pedestrian-Friendly Traffic Signal Control Using SUMO”, SUMO User Conference, Berlin, 13.05.2019-15.05.2019
- **M.A. Silgu**, I.G. Erdagi, H.B. Celikoglu, “Analyzing Network-Wide Effects of Cooperative Adaptive Cruise Control without Traffic Signal Control at Intersections”, 17th International Conference on Computer Aided Systems Theory, Las Palmas,17.02.2019-22.02.2019
- **M.A. Silgu**, G. Akyol, H.B. Celikoglu, “Analysis on Pedestrian Green Time Period: Preliminary Findings From A Case Study”, 17th International Conference on Computer Aided Systems Theory, Las Palmas,17.02.2019-22.02.2019
- G. Goksu, **M.A. Silgu**, S. Hulagu, H.B. Celikoglu, “Coordinated Ramp Metering and Variable Speed Limit Using  $H^\infty$  State Feedback Controller”, MATTS 2018 Mathematics Applied in Transport and Traffic Systems, Delft, 17.10.2018-19.10.2018
- **M.A. Silgu**, K. Muderrisoglu, A.Unsal, H.B. Celikoglu, “Approximation Of Emission For Heavy Duty Trucks In City Traffic”,2018 IEEE International Conference on Vehicular Electronics and Safety (ICVES2018), Madrid, 12.09.2018-14.09.2018, doi: 10.1109/ICVES.2018.8519596
- I.M. Abuamer, M. Sadat, **M.A. Silgu**, H.B. Celikoglu, “Analyzing the effects of driver behavior within an adaptive ramp control scheme: A case-study with ALINEA”, 2017 IEEE International Conference on Vehicular Electronics and Safety (ICVES2017), 109-114,doi: 10.1109/ICVES.2017.7991910
- M. Sadat, I.M. Abuamer, **M.A. Silgu**, H.B. Celikoglu, “A Comparative Performance Analysis of Variable Speed Limit Systems Control Methods Using Micro-Simulation: A Case Study on D100 Freeway, Istanbul”, 16th International Conference on Computer Aided Systems Theory, Las Palmas, 19.02.2017-24.02.2017
- **M.A. Silgu**, E. Ozturk, H.B. Celikoglu, “Vehicular Emissions Based Environmental Impact Assessment of Transportation Networks: A Case Study Analyzing Mobility Patterns of a University Campus”,16th International Conference on Computer Aided Systems Theory, Las Palmas,19.02.2017-24.02.2017
- I.M. Abuamer, **M.A. Silgu**, H.B. Celikoglu, “Micro simulation based ramp metering on Istanbul freeways: An evaluation adopting ALINEA”, 2016 IEEE 19th International Conference on Intelligent Transportation Systems (ITSC), 695-700, doi: 10.1109/ITSC.2016.7795629
- **M.A. Silgu**, H.B. Celikoglu, “Clustering Traffic Flow Patterns by Fuzzy C-Means Method”, 2015, 15th International Congress on Computer Aided Systems Theory, Las Palmas, 08.02.2015 -13.02.2015
- **M.A. Silgu**, H.B. Celikoglu, “Non-hierarchical clustering methods to classify freeway traffic flow states”, 10/2014, 11th International Congress on Advances in Civil Engineering (ACE2014), Istanbul, 21.10.2014 - 24.10.2014
- O. Deniz, **M.A. Silgu**, H.B. Celikoglu, “Comparative evaluation of a cellular automata model and cell transmission model with Istanbul freeway data”, 09/2014, 11th International Congress on Advances in Civil Engineering (ACE2014), Istanbul, 21.10.2014 - 24.10.2014

### Book Chapters

- S. Goncu, **M.A. Silgu**, I. G. Erdagi., H.B. Celikoglu (2023). Sensitivity Analysis for a Cooperative Adaptive Cruise Control Car Following Model: Preliminary Findings. In: Moreno-Díaz, R., Pichler, F., Quesada-Arencibia, A. (eds) Computer Aided Systems Theory – EUROCAST 2022. EUROCAST 2022. Lecture Notes in Computer Science, vol 13789. Springer, Cham. [https://doi.org/10.1007/978-3-031-25312-6\\_43](https://doi.org/10.1007/978-3-031-25312-6_43)
- **M.A. Silgu**, I. G. Erdagi, S. Hulagu, S.Akti, H. Akova, G. Akyol, S. Goncu, G. Goksu, H.B. Celikoglu (2023). A Methodology to Consider Explicitly Emissions in Dynamic User Equilibrium Assignment. In: Moreno-Díaz, R., Pichler, F., Quesada-Arencibia, A. (eds) Computer Aided Systems Theory – EUROCAST 2022. EUROCAST 2022. Lecture Notes in Computer Science, vol 13789. Springer, Cham. [https://doi.org/10.1007/978-3-031-25312-6\\_42](https://doi.org/10.1007/978-3-031-25312-6_42)
- **M.A. Silgu**, Goksad Erdagi, I., & Berk Celikoglu, H. (2019, February). Analyzing network-wide effects of cooperative adaptive cruise control without traffic signal control at intersections. In *International Conference on Computer Aided Systems Theory* (pp. 79-86). Springer, Cham.
- **M.A. Silgu**, Akyol, G, H.B. Celikoglu., (2019, February). Analysis on pedestrian green time period: preliminary findings from a case study. In *International Conference on Computer Aided Systems Theory* (pp. 121-128). Springer, Cham.
- M. Sadat, I.M. Abuamer, **M.A. Silgu**, H.B. Celikoglu, “A Comparative Performance Analysis of Variable Speed Limit Systems Control Methods Using Micro-Simulation: A Case Study on D100 Freeway, Istanbul” in: Moreno-Díaz R., Pichler F., Quesada-Arencibia A. (eds) Computer Aided Systems Theory – EUROCAST 2017. Lecture Notes in Computer Science, January 2018, Vol. 10672, ISBN: 978-3-319-74726-2, Springer International Publishing.
- **M.A. Silgu**, H.B. Celikoglu, “Clustering Traffic Flow Patterns by Fuzzy C-Means Method: Some Preliminary Findings” in Moreno-Díaz R., Pichler F., Quesada-Arencibia A. (eds) Computer Aided Systems Theory – EUROCAST 2015, Lecture Notes in Computer Science, December 2015, Vol. 9520, ISBN: 978-3-319-27339-6, Springer International Publishing
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### Research Projects

- Postdoctoral Researcher at A New Perspective on City Logistics: Concepts, Theory, and Models for Designing and Managing Logistics as a Service (Acr: GoodMobility), European Research Council.
- Researcher at Center of Excellence Project No. 22AG105G039, titled “Sustainable Advanced Vehicle Technologies,” funded by the Scientific & Technological Research Council of Turkey (TUBITAK)
- Researcher, “Effects of Cooperative Vehicle Dynamics in Traffic Flow Modeling: Simulation and Control”, the Scientific and Technological Research Council of Turkey (TUBITAK) research project no: 120M576, 2021–2023.

- “*Environment Friendly Optimization of Transportation Networks: Analysis Over Small Sized Real Network*”, the Scientific and Technological Research Council of Turkey (TUBITAK) research project no: 218M307, 2019–2022.
- “*Micro simulation based ramp metering on Istanbul freeways: An evaluation adopting ALINEA*”, Scientific Research Project (BAP) supported by the Istanbul Technical University, 2016.
- “*Analysis of network flow propagation: model development and utilization of simulation models in calibration process*”, the Scientific and Technological Research Council of Turkey (TUBITAK) - EU COST International research project no: 111M415, 2011–2013.

#### **Attendance In Courses**

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- Short Mediterranean Ph.D School on “Impacts of Climate Change and Sustainable Engineering Responses”, Naples, Italy, 2019.
- 2017 Summer School on “Cooperative Interacting Automobiles”, Schwäbisch Gmünd, Germany.
- EURO Winter Institute on “Methods and Models in Transportation Problems”, Bressanone, Italy, 2017.
- 4th Multitude Summer School, Chios, Greece, 2013.
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#### **Teaching Experience**

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- “Highway Engineering” Course for B.Sc.
- “Railway Engineering” Course for B.Sc.
- “Statistics” for B.Sc.
- “Traffic Techniques and Studies” for M.Sc.
- “Traffic Management” for M.Sc.

#### **Reviewer**

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- IEEE Access
- IEEE Intelligent Transportation Systems Magazine
- Heliyon
- Transportation Research Part C: Emerging Technologies
- Transportation Research Part D: Transport and Environment
- IEEE Transactions on Intelligent Transportation Systems
- Journal of Traffic and Transportation Engineering
- IET Control Theory & Applications
- IET Intelligent Transportation Systems
- Transportation Letters: the International Journal of Transportation Research
- Accident Analysis & Prevention

#### **Memberships**

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- Turkey Civil Engineers Chamber
- Turkey Geological Engineers Chamber
- IEEE Intelligent Transportation Systems Society
- IEEE Vehicular Systems Society
- Bridging Machine Learning and Behavioural Models in Alan Turing Institute