Filippos N. Tzortzoglou

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Education

Cornell University — Ithaca, NY, USA August 2023 - Present
3rd year PhD student in Civil and Environmental Engineering *GPA: 3.7 out of 4 (3.7/4)*
Supervisor: Prof. Andreas A. Malikopoulos

Related Coursework

- Foundations of Complex Systems (Grade A-)
- Transportation Energy Systems (Grade: A)
- Sustainable Transportation Systems Design (Grade: A-)
- Introduction to Reinforcement Learning (Grade: B)
- Optimal Control and Decision Theory (Grade: A-)
- Information Design and Strategic Decisions (Grade: A+)
- Preparing to Write Workshop (Grade: S)

University of Delaware — Newark, DE, USA August 2022 - August 2023
1st year PhD in Mechanical Engineering (continued Ph.D. studies at Cornell University) *GPA: 3.5 out of 4 (3.5/4)*
Supervisor: Prof. Andreas A. Malikopoulos

Related Coursework

- Convex Optimization (Grade: A)
- Linear Systems (Grade: A-)
- Statistical Computing and Optimization (Grade: A)
- Engineering Mathematics (Grade: A-)
- Introduction to Numerical Descretization (Grade: C+)
- Intermediate Dynamics (Grade: B+)

Technical University of Crete — Chania, Greece September 2017 - July 2022
Diploma-Integrated Masters' in Production Engineering and Management *GPA: 8.11 out of 10 (8.11/10)*

Related Coursework

- Programming in C (Grade: 9/10)
- Statistics (Grade: 10/10)
- Non-Linear Programming (Grade: 10/10)
- Artificial Intelligence (Grade: 10/10)
- Robotics (Grade: 9/10)
- Mechatronics (Grade: 9.5/10)
- Control Systems (Grade: 10/10)

Honors and Awards

- *IEEE Outstanding Student Paper Prize 2025 on Smart Cities* for the paper: **F.N. Tzortzoglou**, L.E. Beaver, A. Malikopoulos, "A Feasibility Analysis at Signal-Free Intersections", IEEE Letters on Control Systems Society (LCSS).
- *Third-place paper award* at the 17th IFAC Symposium on Control of Transportation Systems (CTS2024) for the paper: H. Bang, A. Dave, **F.N. Tzortzoglou**, A.A. Malikopoulos, "A Mobility Equity Metric for Multi-Modal Intelligent Transportation Systems". (**Finalist for Best paper award**)
- NSF grant for *Non-Academic Research Internships for Graduate Students (INTERN) Program.*
- Fellowship from the Gerondelis Foundation.

Publications (Journal Papers)

- **F.N. Tzortzoglou**, L.E. Beaver, A. Malikopoulos "A Feasibility Analysis at Signal-Free Intersections", IEEE Letters on Control Systems Society (LCSS) (**IEEE Outstanding Student Paper Prize 2025 on Smart Cities**).
- **F.N. Tzortzoglou**, Craig B., Meng X. and Malikopoulos, A. A. (2024). Handling Pedestrian Uncertainty in Coordinating Autonomous Vehicles at Signal-Free Intersections, Automatica (In Review).
- H. Bang, A. Dave, **F. N. Tzortzoglou**, A. Malikopoulos, "On Mobility Equity and the Promise of Emerging Transportation Systems", submitted on Transactions of Intelligent Transportation Systems (In press).
- V. Le, B. Chalaki, **F. N. Tzortzoglou**, A. A. Malikopoulos "Stochastic Time-Optimal Trajectory Planning for Connected and Automated Vehicles in Mixed-Traffic Merging Scenarios", Transactions of Control Systems Technology (TCST).

Publications (Conference papers)

- **Filippos N. Tzortzoglou**, Logan E. Beaver, and Andreas A. Malikopoulos. "Safe and Efficient Coexistence of Autonomous Vehicles with Human-Driven Traffic at Signalized Intersections." arXiv preprint arXiv:2504.05101 (2025).
- H. Bang, A. Dave, **F.N. Tzortzoglou**, and A.A. Malikopoulos, "A Mobility Equity Metric for Multi-Modal Intelligent Transportation Systems," Proceedings of the 17th IFAC Symposium on Control in Transportation Systems (**Best paper award: Finalist**).
- **F.N. Tzortzoglou**, L.E. Beaver, and A. Malikopoulos, "A Feasibility Analysis at Signal-Free Intersections," 2023, Proceedings of the 63rd Conference on Decision and Control (CDC) (also published in IEEE Control Systems Letters (LCSS)).
- **F.N. Tzortzoglou** and A.A. Malikopoulos, "Signal-Free Intersections and Automated Vehicles — A Case Study in Heraklion, Crete, Greece," 2024, Conference on Emerging Technologies in Transportation Systems (TRC-30).
- **F.N. Tzortzoglou**, D. Theodosis, A. Dave, and A.A. Malikopoulos, "Potential-Based Controller for Efficient Flow of Connected and Automated Vehicles," Proceedings of the 2024 American Control Conference (ACC), IEEE, 2024.
- **F.N. Tzortzoglou**, D. Theodosis, and A. Malikopoulos, "An approach for optimizing acceleration in connected and automated vehicles," Transportation Research Board 103rd Annual Meeting.

Publications (Conference papers)

- D. Theodosis, **F.N. Tzortzoglou**, I. Karafyllis, I. Papamichail, and M. Papageorgiou, "Sampled-data controllers for autonomous vehicles on lane-free roads," in 2022 30th Mediterranean Conference on Control and Automation (MED), pp. 103–108, IEEE, 2022.

Industry Experience

Intern at MathWorks — Boston, MA, USA June 2024 - August 2024

- Developed algorithms for the operation of Connected and Automated Vehicles with the presence of pedestrians in RoadRunner Scenario software.
- Utilized MathWorks tools (cameras, radars, lidars) for the detection and classification of objects in real-time through Simulink and apply efficient control strategies for the avoidance of such objects.
- Utilized Reinforcement Learning Toolbox developed by MathWorks.

Research Experience

Research Assistant — Ithaca NY, USA August 2023 - Present

Research Assistant in the Information and Decision Science Laboratory - Cornell University

- Involved in two NSF projects under Grants CNS-2149520 and CMMI-2219761. Principal Investigator: Andreas Malikopoulos.
- Project leader of a 3-member team working on Virtual Reality environments (Unity) in Mixed Traffic Scenarios.
- Trained members of the IDS Lab in PTV VISSIM software.
- Designed a simulation environment using PTV VISSIM software for the validation of efficient control strategies for Connected and Automated Vehicles operating in a mixed-traffic environment.
- Conducted simulations in MATLAB for the validation of control strategies associated with mobility equity and fair accessibility in services among neighborhoods in the Boston Metropolitan Area.
- Explored controller's feasibility for the operation of Connected and Automated Vehicles in signal-free intersections.

Research Assistant — Newark DE, USA May 2023 - August 2023

Research Assistant in the Information and Decision Science Laboratory - University of Delaware

- Involved in two NSF projects under Grants CNS-2149520 and CMMI-2219761. Principal Investigator: Andreas Malikopoulos.
- Designed and improved controller strategies for the operation of Connected and Automated vehicles on lane-based road environments.

Research Assistant — Chania, Greece July 2021 - July 2022

Research Assistant in the Dynamic Systems and Simulation Laboratory (DSSL Lab) - Technical University of Crete

- Involved in the ERC advanced grant with title: TrafficFluid — Lane-free Artificial-Fluid Environment for Vehicular Traffic. Principal Investigator: Markos Papageorgiou.

- Designed decentralized control strategies for the two-dimensional movement of autonomous vehicles on lane-free roads.
- Performed simulations using Mathematica' and MATLAB' softwares to visualize the related results.

Team Manager, Chania, Greece August 2020 - January 2022

Team Manager of the TUCer team (**T**echnical **U**niversity of **C**rete **e**co **r**acing)

- Developed zero emission, low consumption, hydrogen-powered, electric prototype vehicles. TUCer team has won several awards at international low-consumption competitions.

Teaching Experience

Teaching Assistant — Newark DE, USA August 2022 - May 2023

- Teaching assistant at the University of Delaware at the Mechanical Engineering department in the courses Control Systems Laboratory and Solid Mechanics Laboratory.
- Kept office hours.
- Grading.

Skills

- **Traffic Simulation Software:** Proficient in PTV VISSIM, SUMO, and RoadRunner. See illustrative projects in VISSIM, SUMO, RoadRunner, Automated Driving Toolbox (by MATLAB).
- **Programming Languages:** Advanced in Python and Matlab; Intermediate in C. Over 4 years of experience in developing simulation and optimization algorithms.
- **Experience with GitHub:** See illustrative project at this link.
- **Optimization Software:** Experienced in solving large-scale optimization problems using Gurobi software.
- **Machine Learning:** Knowledgeable in designing and implementing Neural Networks for data analysis and predictive modeling.