

# AGUSTIN GUERRA

888-858-6716 | [agustinguerra@ufl.edu](mailto:agustinguerra@ufl.edu) | [LinkedIn](#) | [Website](#)

## PROFESSIONAL SUMMARY

---

I am a highly motivated engineering professional with **+5** years of experience in the transportation industry and **+4** years of research experience in traffic engineering. My research interest includes optimization frameworks considering Connected and Automated Vehicles (CAVs) capabilities, real-time implementation of CAVs, traffic flow theory, microsimulation, human factors, and driving simulator studies. Currently, my PhD dissertation focuses on developing optimization algorithms for **real-time** applications considering CAVs in urban arterials. The algorithms are developed and simulated in **Python** considering the joint optimization of vehicles' trajectories and Signal Phasing and Timing (SPaT).

## EDUCATION

---

### PhD, Civil Engineering

*University of Florida*

*Dissertation: Optimization of Traffic Performance in Signalized Arterials with CAVs*

Aug. 2019 – Expected May 2023

*Gainesville, FL*

### MS, Civil Engineering

*University of Kansas*

*Thesis: Modeling Discretionary Lane Change in a Connected Environment*

Aug. 2017 – May 2019

*Lawrence, KS*

### BS, Civil Engineering

*Universidad Tecnologica de Panama*

Mar. 2008 – May 2013

*Panama, PA*

## RESEARCH EXPERIENCE

---

### Graduate Research Assistant

*University of Florida*

Aug. 2019 – Present

- Develop optimization algorithms in Python for arterials considering CAVs capabilities
- Assist in the implementation of optimization algorithm for isolated intersections
- Facilitate the coordination of projects' activities to meet deadlines
- Formulated different optimization models to reduce intersections' delays (LP, IP, MILP)
- Developed heuristic methods to reduce delays in arterials (search-based algorithms)
- Developed a Python-based data pipeline to extract CAVs trajectories from connected vehicles
- Worked on data preprocessing, and data imputation
- Evaluated machine learning algorithms to estimate the occurrence of future crashes

### Master's Thesis

*University of Kansas*

May. 2018 – May. 2019

- Conducted a driving simulator study to assess human behavior under-connected environments during Discretionary Lane-Changing (DLC) maneuvers
- Implemented a predictive DLC fuzzy logic model in a driving simulator

## SUMMARY OF RESEARCH SKILLS

---

- Optimization modeling (LP, MIP, heuristic search), Python (Matplotlib, CPLEX, Gurobi, Numpy, Pandas, SciPy, scikit-learn, TensorFlow), signal control/traffic flow theory, human-factors, driving simulator, data pipelines, project management, research methodology & design, participant recruitment, data collection, data management, data analysis, R, SPSS,  $\text{\LaTeX}$ , oral presentations, Education and Public Outreach (EPO)

## PUBLICATIONS

---

### Peer-Reviewed Journals

- [1] **Guerra, A.**, L. Elefeteriadou. Platooning Trajectory Optimization for Connected Automated Vehicles in Coordinated-Arterials. *Transportation Research Record*, 2022

### Conference Proceedings

- [1] L. Carvalho, **Guerra, A.**, X. Wang, P. Manjunatha, L. Elefeteriadou. Simulation Platform for Testing and Evaluation of CAV Trajectory Optimization and Signal Control Algorithm Integrated with Commercial Traffic Simulator. *Proceedings of the 2022 Winter Simulation Conference*

### Under Preparation

- [1] **Guerra, A.**, L. Elefeteriadou. Joint Optimization Framework to Improve Traffic Performance in Signalized Coordinated-Arterials in an Automated Environment, 2023
- [2] **Guerra, A.**, L. Elefeteriadou. Integration and Comparison of Optimization Methodologies for Connected and Automated Vehicles in a Commercial Microsimulator, 2023
- [3] **Guerra, A.**, L. Elefeteriadou. Modeling Driving Behavior in a Connected Environment. A Case Study for Signalized Arterials, 2023

## TEACHING EXPERIENCE

---

### Teaching Assistant

Sep. 2020 – Dec. 2020

University of Florida

- Dictated 3 graduate lectures for the traffic flow theory course
- Explained and assisted students with traffic flow theory assignments
- Created reference material (example problems) to assist students to understand key concepts (motion of single vehicles, car-following models, shock-wave analysis, flow regimes, capacity)
- Educated on deficiencies of existing signal control strategies (detection, communication delay, computation time)
- Introduce CAVs concepts, discrete optimization methods, Python-programming language as a tool for developing optimization frameworks for CAVs
- Developed reference material for PhD students about Python, version control (git, and github), and discrete optimization

## PRESENTATIONS

---

- [1] **Guerra, A.**, L. Elefteriadou. Optimizing Signalized Coordinated Arterial Performance in a Fully Automated Environment. A Heuristic Approach. *The Transportation Research Board (TRB) 102st Annual Meeting*, 2023
- [2] **Guerra, A.**, L. Salas-Nino. Actuated Micromobility Users Presence Awareness System in Urban Arterials. *The Transportation Research Board (TRB) 102st Annual Meeting*, 2023
- [3] Elefteriadou, L., Amini, E., Carvalho, L., **Guerra, A.**, L. Elefteriadou. T3e Webinar presentation: Leveraging CAVs to Improve Traffic Operational Quality. *7th Annual UTC Conference for the Southeastern Region*, 2022
- [4] **Guerra, A.**, L. Elefteriadou. A Trajectory-based Method for Platoon Formation of Connected and Automated Vehicles. *7th Annual UTC Conference for the Southeastern Region*, 2022
- [5] **Guerra, A.**, L. Elefteriadou. Platooning Trajectory Optimization for Connected Automated Vehicles in Coordinated-Arterials. *The Transportation Research Board (TRB) 101st Annual Meeting*, 2022
- [6] **Guerra, A.**, L. Elefteriadou. Platooning Trajectory and Signal Phasing Optimization for Connected Automated Vehicles in Coordinated-Arterials. *The Transportation Research Board (TRB) 101st Annual Meeting*, 2022
- [7] **Guerra, A.**, L. Elefteriadou. Computation Efficient Alternative for Connected Automated Vehicles Platoon Formation. *Florida Automated Vehicle (FAV) Summit*, 2021
- [8] **Guerra, A.**, M. Asgharzadeh, A. Kondyli. Discretionary Lane Changing Decisions for Connected-Vehicles Based on Fuzzy Logic. *Transportation Research Board 99th Annual Meeting* *Transportation Research Board*, 2020

## TECHNICAL REPORTS

---

- [1] Manjunatha P., L. Elefteriadou, M. Hunter, H. Zhou, S. Noei, **A. Guerra**, L. Carvalho, R. Favero, A. Guin, A. Saroj. Evaluation of Advanced Vehicle and Communication Technologies through Traffic Microsimulation (Project I5) *Phase II, Task 1*, 2022 (ongoing project)

## LEADERSHIP/INVOLVEMENT

---

<b>Founding Member and Chair of the IEEE-ITSS Student Chapter:</b> Led the efforts to establish an IEEE Student Chapter branch of the ITSS at the University of Florida	2022 – Present
<b>ITE University Chapter Vice President:</b> Coordinated student seminars and <u>ITE</u> activities	2021 – 2022
<b>Student Representative at the UFTI Internal Steering Committee:</b> Promoted engagement activities between industry professionals and students	2020 – 2022
<b>Media Manager at KU Fulbright Student Association:</b> Led dissemination of activities promoted by the Fulbright Student Board, 2018	2018 – 2019

## FELLOWSHIPS & AWARDS

---

- **Anne Brewer Academic Scholarships** : Awarded by the Intelligent Transportation Society (ITS) Florida Chapter 2022
- **Fulbright Fellowship**: Awarded by the U.S Bureau of Educational and Cultural Affairs to complete a Master's Degree at the University of Kansas 2017
- **Global Best Project in Roads and Highways**: Awarded by the ENR for the Coastal Beltway project in Panama 2015

## PROFESSIONAL SOCIETIES

---

IEEE: Institute of Electrical and Electronics Engineers	2022 – Present
IEEE-ITSS: IEEE Intelligent Transportation Systems Society	2022 – Present
ASCE: American Society of Civil Engineers	2022 – Present
ITE: Institute of Transportation Engineers	2019 – Present

## INDUSTRY EXPERIENCE

---

<b>Highway &amp; Traffic Consultant</b> <i>WSP</i>	May 2019 – Aug. 2019 <i>Panama</i>
<ul style="list-style-type: none"><li>• Provided safety assessment for roadways, interchanges, and intersections</li><li>• Developed geometric design proposals</li><li>• Conducted earthwork estimation for highway projects</li></ul>	
<b>Highway Engineer</b> <i>Louis Berger</i>	Nov. 2012 – Aug. 2017 <i>Panama</i>
<ul style="list-style-type: none"><li>• Developed geometric designs for proposal and as-built drawings for highway projects. Project portfolio comprises several projects in the Latin American region (Panama, Colombia, Honduras, and Peru) adding up to \$3 billion in construction amount</li><li>• Coordinated with different departments (geotechnical, hydraulic, and pavement) to meet deadlines</li><li>• Created digital model terrain for highway projects</li><li>• Verified slope stability analysis using the Slide-Rockscience software</li><li>• Supervised and mentored drafter team with 4 people</li></ul>	

## REFERENCES

---

<b>Lily Elefteriadou, PhD</b> : Barbara Goldsby Professor, University of Florida	elefter@ce.ufl.edu
<b>Alexandra Kondyli, PhD</b> : Associate Professor, University of Kansas	akondyli@ku.edu
<b>Aurora Izquierdo</b> : Civil Structural Engineer II, WSP	Aurora.Izquierdo@wsp.com
<b>Juliana Canas</b> : Senior Advisor, First Climate	juliana.canas-vanegas@firstclimate.com