

## Pruthvi Manjunatha

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### Research Areas

Traffic Operations, Autonomous and Connected Vehicle Technologies, Traffic Microsimulation, Signal Control, Intelligent Transportation Systems, Autonomous Transit, Human Factors in Traffic Engineering, Driving Simulation.

### Education

Doctor of Philosophy, Civil Engineering, University of Florida, Gainesville, Florida, August 2018.

Dissertation: Identification, Measurement and Incorporation of Human Factors in Traffic Microsimulation Using Driving Simulator Observations

Master of Technology, Transportation Systems Engineering, Indian Institute of technology, Bombay, India June 2012. Thesis (At Karlsruhe Institute of Technology, Germany): A Methodology for Calibration of Traffic Micro Simulators in Mixed Traffic Condition

Bachelor of Engineering, Civil Engineering, Visvesvaraya Technological University, Mysore, India, May 2010. Thesis: Stabilization of Coal Ashes for Use in Various Geotechnical Engineering Applications

### Awards and Scholarships

German Academic Exchange (DAAD) Scholar – Karlsruhe Institute of Technology, Germany (September 2011 – May 2012)

Runner-up, ITE International Annual Traffic Bowl Competition, Seattle (2014)

Karnataka State Council for Science and Technology Research Scholar (2009-2010)

All-India Ranking of 251 (out of over 100,000 students) in the National Graduate Entrance Exam for Civil Engineering.

### Current Employment

**Research Assistant Professor and Manager of the I-STREET Living Lab**, University of Florida Transportation Institute (UFTI) (Since July 2019): Coordination with the City of Gainesville and Florida Department of Transportation in the planning and implementation of I-STREET projects. Working with industry partners to coordinate software, hardware and application efforts and ensure consistency and interoperability of various components.

Current projects:

- Research on Artificial-Intelligence for Data Integration with State Highways (RADISH)
- Support for the I-STREET (Implementing Solutions from Transportation Research Evaluation of Emerging Technologies) Living Lab
- Scan and Review of Autonomous Shuttle Operations and Other Personal Transportation Options Affecting Autonomous Transit Viability

- Evaluation of Gainesville Pedestrian-Bicyclists' Connected Vehicle Pilot Phase 2
- Evaluation of Interstate 4 (I-4) Florida's Regional Advanced Mobility Elements- Phase 2
- Evaluation of Advanced Vehicle and Communication Technologies using Microsimulation Phase 2

Completed projects:

- Evaluation of Cooperative Automation Research Mobility Applications (CARMA) for I-STREET Living Lab Implementation
- Transportation Mobility Assessment and Recommendations for Smart City Planning
- Develop, Refine, and Validate a Survey to assess Adult's Perspectives of Autonomous Ride-Sharing Services
- Extended Development and Testing of Optimized Signal Control with CAVs
- Data Analytics and Evaluation of the Gainesville Trapezium Connected Vehicle Signal Phase and Timing (SPaT) Deployment Project
- Evaluation of Advanced Vehicle and Communication Technologies using Microsimulation Phase 1
- Evaluation of Interstate 4 (I-4) Florida's Regional Advanced Mobility Elements Phase 1
- Evaluation of Gainesville Pedestrian-Bicyclists' Connected Vehicle Pilot Phase 1

## Previous Employment

### **Post-Doctoral Associate**, UFTI (October 2018 – July 2019)

- Evaluation of Public Acceptance of Autonomous Technology in Gainesville, FL
- Evaluation of Arterial Corridor Improvements and Traffic Management Plans in Florida
- TTE 6259 Urban Streets Simulation and Control (Instructor)

### **Graduate Assistant**, University of Florida (August 2013-August 2018)

- Evaluation of Adaptive Signal Controlled Corridors in Florida (Lead Researcher)
- Development of Support Systems and Instructional Modules for Driving Simulator at UF
- TTE 4004c Transportation Engineering (Instructor)
- TTE 6267 Traffic Flow theory (Teaching Assistant)

### **Graduate Transport Planner**, Atkins, India (July 2012 – July 2013)

- Traffic Impact Assessment, Microsimulation Modeling, Signal Optimization.
- Working experience with VISSIM, LINSIG, ARCADY and PICADY
- Preliminary knowledge of demand modeling with EMME and SATURN
- Working experience with English and Welsh Traffic codes and manuals

### **Teaching Assistant**, Indian Institute of Technology (July 2010 – July 2011)

- CE 434: Traffic Analysis and Design (Lab Instructor)
- CE 740: Traffic Engineering (TA)

## Research Grants

- Interstate 4 (I-4) Florida's Regional Advanced Mobility Elements Stakeholder Coordination for Phase II: Comprehensive Assessment of "Before" and "After" Conditions  
Grant number: BED31-977-018  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$527,682  
Dates Conducted: June 2023 to June 2028
- Evaluation of Gainesville Pedestrian-Bicyclists Connected Vehicle Pilot  
Grant number: BED31-977-023  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$308,385  
Dates Conducted: June 2023 to June 2028
- Scan and Review of Autonomous Shuttle Operations and Other Personal Transportation Options Affecting Autonomous Transit Viability  
Grant number: BED31-977-022  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$171,600  
Dates Conducted: June 2023 to May 2024
- Research on Artificial-Intelligence for Data Integration with State Highways (RADISH)  
Grant number: BED31-977-008  
Source of Funding: Florida Department of Transportation  
Role: Lead Researcher  
Total Amount Awarded: \$321,020  
Dates Conducted: June 2022 to March 2024
- Support for the I-STREET Living Lab  
Grant number: BED31-977-006  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$232,593  
Dates Conducted: June 2022 to November 2023
- Before-After Study of Pedestrian-Bicyclists Gainesville Connected Vehicle Pilot  
Grant number: BDV31-977-120  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$412,989

Dates Conducted: June 2019 to October 2023

- Before Remote Sensing and Prediction of Environmental Noise to Facilitate Addressing the Social and Health Issues of Noise - Pilot Study: Schools and Hospitals  
Grant number: NSF 2125427  
Source of Funding: National Science Foundation  
Role: Lead Researcher  
Total Amount Awarded: \$149,437  
Dates Conducted: October 2021 to September 2023
- Evaluation of Advanced Vehicle and Communication Technologies through Traffic Microsimulation (Phase 2)  
Grant number: STRIDE Project I5  
Source of Funding: STRIDE UTC USDOT  
Role: PI  
Total Amount Awarded: \$500,292  
Dates Conducted: August 2021 to March 2023
- Evaluation of Interstate 4 (I-4) Florida's Regional Advanced Mobility Elements  
Grant number: BDV31-977-139  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$314,334  
Dates Conducted: March 2021 to December 2022
- Evaluation of CARMA for I-STREET implementation  
Grant number: BDV31-977-145  
Source of Funding: Florida Department of Transportation  
Role: PI  
Total Amount Awarded: \$94,948  
Dates Conducted: January 2022 to November 2022
- Public Acceptance of Autonomous Vehicle (AV) Technology  
Grant number:  
Source of Funding: University of Florida  
Role: Lead Researcher  
Total Amount Awarded: \$49,918  
Dates Conducted: May 2017 to September 2022
- Transportation Mobility Assessment and Recommendations  
Grant number: BDV31-977-115  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$468,877

Dates Conducted: June 2019 to November 2021

- Data Analytics and Evaluation of the Gainesville Trapezium Connected Vehicle Signal Phase and Timing (SPaT) Deployment Project  
Grant number: BDV31-977-117  
Source of Funding: Florida Department of Transportation  
Role: Lead Researcher  
Total Amount Awarded: \$249,655  
Dates Conducted: June 2019 to November 2021
- Develop, Extended Development and Testing of Optimized Signal Control with CAVs  
Grant number: BDV31-977-109  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$434,010  
Dates Conducted: March 2019 to July 2021
- Develop, Refine, and Validate a Survey to Assess Adult's Perspectives of Autonomous Ride-Sharing Services for Human Factors and Traffic Operational Observations  
Grant number: BDV31-977-128  
Source of Funding: Florida Department of Transportation  
Role: Co-PI  
Total Amount Awarded: \$203,948  
Dates Conducted: November 2019 to June 2021
- Evaluation of Advanced Vehicle and Communication Technologies through Traffic Microsimulation (Phase 1)  
Grant number: STRIDE Project D (2018-004)  
Source of Funding: STRIDE UTC USDOT  
Role: PI  
Total Amount Awarded: \$142,376  
Dates Conducted: April 2018 to February 2021
- Development of Support Systems, Instructional Modules, and a Case Study for the Enhanced Driving Simulator at the Gator Tech Smart House  
Grant number: STRIDE Project H (2016-006)  
Source of Funding: Florida Department of Transportation  
Role: Lead Researcher  
Total Amount Awarded: \$49,992  
Dates Conducted: May 2017 to September 2020
- Evaluation of Arterial Corridor Improvements and Traffic Management Plans in Florida  
Grant number: BDV-32-977-44  
Source of Funding: Florida Department of Transportation

Role: Lead Researcher

Total Amount Awarded: \$137,964

Dates Conducted: June 2015 to September 2019

- Before and After-Implementation Studies of Advanced Signal Control Technologies in Florida  
Grant number: BDV-32-977-05  
Source of Funding: Florida Department of Transportation  
Role: Lead Researcher  
Total Amount Awarded: \$840,133  
Dates Conducted: May 2014 to September 2019

## Research Papers

Karamouzis, O., Kibet, L., Manjunatha, P., & Elefteriadou, L. "State-of-the-Art Vehicle-to-Pedestrian(V2P) Systems Technology: Survey and Recommendations for Effective Deployments". IEEE Transactions on Intelligent Transportation Systems., September 2023 (Under review)

Jeghers, M., Classen, S., Manjunatha, P., & Elefteriadou, L. "An examination of two diverse communities: Residents' transportation behaviors, challenges, and opportunities". OTJR: Occupation, Participation, and Health., March 2023

<https://doi.org/10.1177/15394492231167780>

Carvalho, L., Guerra, A., Wang, X., Manjunatha, P., and Elefteriadou, L. "Simulation Platform for Testing and Evaluation of CAV Trajectory Optimization and Signal Control Algorithm Integrated with Commercial Traffic Simulator" Winter Simulation Conference, INFORMS, Singapore. December 2022.

Manjunatha, P., Roy, S., Elefteriadou, L., Guin, A., Hunter, M. "Evaluation of the Operational Effects of Autonomous and Connected Vehicles through Microsimulation" Journal of Transportation Research Record., February 2022.

<https://doi.org/10.1177/03611981211068460>

Manjunatha, P., Mason, J., Classen, S., Elefteriadou, L., Huang, E. "Public Perception and Lessons Learned from Autonomous Shuttle Demonstration Studies". Transportation Research Board Annual Meeting. Washington D.C., January 2022

Mohebbi, M., Patni, S., Elefteriadou, L., Srinivasan, S., Manjunatha, P. "Transportation Mobility Assessment and Recommendations for Smart City Planning". Transportation Research Board Annual Meeting. Washington D.C., January 2022

Manjunatha, P., Banerjee, T., Sengupta, R., Dong, S., Aghdashi, B. Elefteriadou, L and Ranka, S. "An automated system for operational evaluation of signalized intersections: A case study on the impact of COVID-19 pandemic on traffic patterns". PANAM Conference, Lima, Peru 2021.

Jeghers, M., Classen, S., Manjunatha, P., & Elefteriadou, L.. "An Examination of Two Diverse Communities: Residents' Transportation Behaviors, Challenges, and Opportunities". Manuscript in

consideration at the Journal of Transport and Health September 2021.

Manjunatha, P., Duan, X., Ankomah, A., Elefteriadou, L., Srinivasan, S., Ponnaluri, R. "Evaluation of Adaptive Signal Control Technologies in Florida" In: Proceedings of the 98th Transportation Research Board Annual Meeting. Washington D.C., 2020

Manjunatha, P., Kummetha, V., Kondyli, A., Elefteriadou, L. "Validating the Task-Capability Extension to the Intelligent Driver Model (IDM) Using Driving Simulator Data" In: Proceedings of the 98th Transportation Research Board Annual Meeting. Washington D.C., 2019

Manjunatha, P., Elefteriadou, L. "A Framework For Incorporating Human Factors In Microsimulation Using Driving Simulator Observations" In: Proceedings of the 98th Transportation Research Board Annual Meeting. Washington D.C., 2019

Manjunatha, P., Elefteriadou, L. "Analysis of Wiedemann Car Following Thresholds Using Driving Simulator Observations", In: Proceedings of the 97th Transportation Research Board Annual Meeting. Washington D.C., 2018

Manjunatha, P., Kondyli, A, Elefteriadou, L. "How Has Driver Behavior Been Considered in Traffic Microsimulation and How Can We Use Cognitive Sciences and Psychology Studies to Enhance Them?", In: Proceedings of the 96th Transportation Research Board Annual Meeting. Washington D.C., 2017

Zheng, Y., Manjunatha, P., Elefteriadou, L, Ponnuluri, R. "Empirical Assessment of Adaptive Signal Control Technologies in Florida", In: Proceedings of the 96th Transportation Research Board Annual Meeting. Washington D.C., 2017

Manjunatha, P., Mathew, T.V., Vortisch, P. "Methodology for the Calibration of VISSIM in Mixed Traffic", In: Proceedings of the 92nd Transportation Research Board Annual Meeting. D.C., 2013

## **Research Reports**

Manjunatha, P. Agarwal, N. et al. "Evaluation of CARMA for I-STREET Testbed Implementation" Project BDV32-977-115, FDOT, 2022.

Elefteriadou, L., Manjunatha, P. et al. "Transportation Mobility Assessment and Recommendations for Smart City Planning" Project BDV32-977-115, FDOT, 2021.

Banerjee, T., Manjunatha, P. et al. "Data Analytics and Evaluation of the Gainesville Trapezium Connected Vehicle Signal Phasing and Timing (SPaT) Deployment Project" Project BDV31-977-117, FDOT, 2021.

Classen, S., Mason, J., Manjunatha, P. et al. "Develop, Refine, and Validate A Survey to Assess Adult's Perspectives of Autonomous Ride-Sharing Services for Human Factors and Traffic Operational Observations" Project BDV31-977-128, FDOT, 2021.

Manjunatha, P., Elefteriadou, P., et al. "Evaluation of Advanced Vehicle and Communication Technologies through Traffic Microsimulation", STRIDE Project D, 2021.

Elefteriadou, L., Manjunatha, P. et al. "Before and After-Implementation Studies of Advanced Signal Control Technologies in Florida", Project BDV32-977-05, FDOT, 2019.

Elefteriadou, L., Manjunatha, P. et al. "Evaluation of Arterial Corridor Improvements and Traffic Management Plans in Florida", Project BDV31-977-44, FDOT, 2019.

Elefteriadou, L., Manjunatha, P., Srinivasan, S., Agarwal, N., Semensky, S., "Public Acceptance of Autonomous Vehicle (AV) Technology", UFTI, 2019.

Srinivasan, S., Rogers, J., Manjunatha, P., Maldonado, P., & Yarney, A. "Development of Support Systems, Instructional Modules, and a Case Study for the Enhanced Driving Simulator at the Gator Tech Smart House", STRIDE, 2017.

### **Professional Activities**

- Member/Reviewer, ACH 50 (Previously AND30)- Simulation and Measurement of Vehicle and Operator Performance, Transportation Research Board (Since 2019)
- Review Editor, Journal- "Frontiers in Future Transportation" (Since 2022)
- Advisor, IEEE-ITS Student chapter at UF (Since 2022)
- Mentor, University of Florida Cricket Team
- Reviewer, ACH30-Standing Committee on Human Factors of Vehicles (Since 2022)
- Member/Reviewer, Simulation Subcommittee, Transportation Research Board (Since 2016)
- Member, World Conference on Transportation Research Society (WCTRS) (Since 2019)
- Reviewer, ADD30 - Transportation and Land Development, Transportation Research Board
- Reviewer, National Institute for Transportation & Communities (NITC) (Since 2020)
- Reviewer, The Pacific Northwest Transportation Consortium, UTC for Region 10
- Institute of Transportation Engineers' UF Student Chapter. Treasurer (2014), Secretary (2015)

### **Invited Talks and Presentations**

- Presenter, "Workshop on Development of CAV Education Materials for Graduate and Undergraduate Civil Engineering Students", Auburn, AL, September 2023.
- Co-host, "Florida Plugfest" – A comprehensive CV2X technology testing event at Suntrax test facilities, Auburndale, FL, May 2023.
- Presenter, "Lessons Learnt from Emerging Transportation Technology deployments at I-STREET Living Lab", First Coast ITE District, North Florida Transportation Planning Organization (NFTPO), Jacksonville, FL, February 2023.
- Presenter, "I-STREET Living Lab and Autonomous Shuttles", TRB ARTS Conference,



Anaheim, CA, July 2022.

- Panelist, Florida ITE student leadership summit, Tallahassee, FL, February 2022
- Presiding Committee Member for ACH 50, Lecture Session 1393- Field and In-the loop studies of Driver Behaviors, TRB Annual Conference, Washington D.C., January 2022
- Presenter, "I-STREET: Implementing Solutions from Transportation Research and Evaluation of Emerging Technologies", webinar at NCCAV Center, North Carolina. November 2021
- Panelist, Research to Practice Transit Symposium, Florida. October 2021.
- Presenter, "Findings from Autonomous Shuttle Demonstrations and Challenges Ahead", webinar at STRIDE Center, US Department of Transportation. October 2021.
- Organizer/Host at the CoMotion Miami Mobility Challenge, powered by I-STREET. (The main event for this conference was headlined by USDOT Secretary Pete Buttigieg) June 2021.
- Presenter, "Evaluation of the Operational Effects of Autonomous and Connected Vehicles through Microsimulation", Transportation Research Board CAV Workshop November 2020.
- Presenter, "Autonomous and Connected Vehicle Operational Performance Evaluation Using PTV-VISSIM" PTV User Group Meeting November 2020.
- Presenter, "I-STREET: Implementing Solutions from Transportation Research and Evaluation of Emerging Technologies", webinar at STRIDE Center, US Department of Transportation. September 2020
- Presenter, "Evaluation of the Operational Effects of Connected and Autonomous Vehicles (CAVs) through Microsimulation", webinar at STRIDE Center, US Department of Transportation. September 2020
- Panelist, "STRIDE Stakeholder Engagement Webinar", webinar at STRIDE Center, US Department of Transportation. August 2020
- Panelist, "Advancing Safety and Mobility Using Emerging Technologies", Florida Automated Vehicles (FAV) Summit, Miami. (The main event for this conference was headlined by FL state senator Jeff Brandes) November 2019.

### **Media Coverage**

- The American Association of State Highway and Transportation Officials (AASHTO) Journal Website - Florida DOT Sponsoring Pedestrian Research Project (November 2022), available at [https://aashtojournal.org/2022/09/02/florida-dot\\_sponsoring-pedestrian-safety-research-project/](https://aashtojournal.org/2022/09/02/florida-dot_sponsoring-pedestrian-safety-research-project/)
- Traffic Technology Today (tti News) - Florida DOT Collaborating with University on Next-Gen Pedestrian Detection (September 2022), available at [https://www.traffictechnologytoday.com/news/vulnerable-road-users/florida-dot\\_collaborating-](https://www.traffictechnologytoday.com/news/vulnerable-road-users/florida-dot_collaborating-)

[with-university-on-next-gen-pedestrian-detection.html](#)

- WCJB-TV News - UF Researchers Install Sensors to Study Pedestrian Safety Tech (August 2022), available at [https://www.wcjb.com/2022/08/31/uf-researchers-install\\_sensors-study-pedestrian-safety-tech/](https://www.wcjb.com/2022/08/31/uf-researchers-install_sensors-study-pedestrian-safety-tech/)
- CBS4 you - Pedestrian Deaths Could Be Prevented with new Technology Being Tested at UF (August 2022), available at [https://mycbs4.com/news/local/pedestrian-deaths\\_could-be-prevented-with-new-technology-being-tested-at-uf](https://mycbs4.com/news/local/pedestrian-deaths_could-be-prevented-with-new-technology-being-tested-at-uf)
- NPR-WUFT News - Gainesville's Autonomous Shuttle Incorporates New Technology (April 2022), available at [https://www.wuft.org/news/2022/04/14/gainesvilles\\_autonomous-shuttle-incorporates-new-technology/](https://www.wuft.org/news/2022/04/14/gainesvilles_autonomous-shuttle-incorporates-new-technology/)
- The Gainesville Sun - Lessons Learned from Gainesville's Experiment with Driverless Buses (March 2022).
- Civil Conversations Podcast - Episode 1: Transportation with Dr. Pruthvi Manjunatha (August 2018)
- CBS4 you News in You Tube - UF Traffic Project Uses Technology to Improve Safety,
- Gainesville's Traffic Tuesday's Segment on the Gainesville Trapezium Project.