# KRISHNA MURTHY GURUMURTHY

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## EDUCATION

**The University of Texas at Austin, USA** *expected* May 2021

Doctor of Philosophy in Civil Engineering (*Transportation Engineering*) GPA: 4.00 / 4.00

*Courses* 'Dynamic Traffic Assignment' and 'Bayesian Statistical Methods'

**The University of Texas at Austin, USA** December 2017

Master of Science in Civil Engineering (*Transportation Engineering*) GPA: 3.81 / 4.00

*Thesis* Perceptions and Preferences of Autonomous and Shared Autonomous Vehicles: A Focus on Dynamic Ride-Sharing

*Courses* 'Statistical Modeling I', 'Advanced Theory of Traffic Flow', 'Optimization 1', 'Design and Evaluation of Ground-based Transportation Systems', 'Sensors and Signal Interpretation', 'Transportation Network Analysis', 'Urban Transportation Planning' and 'Linear Regression and Discrete Choice Methods'

**National Institute of Technology Karnataka (NITK), India** May 2016

Bachelor of Technology in Civil Engineering GPA: 8.92 / 10.00

*Courses* 'Highway and Traffic Engineering', 'Railways, Tunnels, Harbors and Airports' and 'Traffic Engineering and Management'.

## EXPERIENCE

**Graduate Research Assistant** Supervisor: Dr. Kara Kockelman Fall 2016 – Present

Responsible for an ANL project focusing on transportation planning/forecasting for autonomous vehicles *UT Austin*

**Research Aide – Technical** Supervisor: Dr. Joshua Auld Summer 2018

Tasked with developing algorithms for the control of shared-automated vehicle fleets and implementing the control & optimization algorithms in ANL's POLARIS *Argonne National Laboratory*

**Graduate Teaching Assistant** Course Instructor: Dr. Kara Kockelman & Ms. Heidi Ross* Spring 2017 & 2018*

Responsible for students' performance, grading, lab lectures (on MicroStation and GEOPAK) and final design-project outcome in a capstone course for transportation engineering *UT Austin*

**Project Research Intern** Supervisors: Drs. Tom V Mathew & Gowri Asaithambi Spring 2016 – Summer 2016

Tasked with devising incorporating traffic models into existing simulation software *IIT Bombay*

**Summer Research Intern** Supervisor: Dr. Tom V Mathew Summer 2015

Tasked with devising and programming microscopic traffic model and simulation software in MATLAB *IIT Bombay*

## PAPERS & PRESENTATIONS (selected)

- **Gurumurthy, K.M.**, Kockelman, K. and Simoni, M.D. 2018. Benefits & Costs of Ride-Sharing in Shared Automated Vehicles Across Austin, Texas: Opportunities for Congestion Pricing. Under review for presentation at the 98th Annual Meeting of the Transportation Research Board.
- Mahmoud, J., Auld, J., and **Gurumurthy, K.M.** 2018. Intra-Household Fully Automated Vehicles Assignment Problem: Model Development and Case Study. Under review for presentation at the 98th Annual Meeting of the Transportation Research Board.
- Simoni, Michele D., Kockelman, K., **Gurumurthy, K.M.** and Bischoff, J. 2018. Congestion Pricing in a World of Self-Driving Vehicles: An Analysis of Different Strategies in Alternative Future Scenarios. Under review in *Transportation Research Part C: Emerging Technologies*.
- **Gurumurthy, K.M.** and Kockelman, K. 2018. Modeling Americans' Autonomous Vehicle Preferences: A Focus on Dynamic Ride-Sharing, Privacy & Long-Distance Mode Choices. Summary presented at the 2017 Automated Vehicles Symposium in San Francisco, California, 11-13 July, 2017 titled "Deeper Understanding of Americans' Autonomous Vehicle Preferences: Questions on Long-Distance Travel, Ride-Sharing, Privacy, & Crash Ethics" and under review for presentation at the 98th Annual Meeting of the Transportation Research Board.
- **Gurumurthy, K.M.** and Kockelman, K. 2018. Analyzing the Dynamic Ride-Sharing Potential for Shared Autonomous Vehicle Fleets using Cellphone Data from Orlando, Florida. *Computers, Environment and Urban Systems* 71: 177-185.
- Invited Speaker, at the Machine Intelligence in Autonomous Vehicles Summit held in San Francisco, presentation titled "Anticipating a World of Shared Fully-Automated Vehicles" on behalf of Dr. Kara Kockelman, 23-24 March, 2017.

## SOFTWARE SKILLS

MATLAB • TransCAD • Java • Microsoft Office Suite • R • ArcGIS • C# • C++ • Python

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## SELECT RESEARCH PROJECTS

**Implementing Shared Autonomous Vehicles in POLARIS and Assessing the Impact of Dynamic Ride-Sharing in Chicago** Fall 2018 – Present

Supervisor: Dr. Kara Kockelman (Sponsored by Argonne National Laboratory) *UT Austin*

POLARIS, an agent-based discrete event simulator developed by the Argonne National Laboratory, is being enhanced to simulate shared autonomous vehicles with dynamic ride-sharing capabilities. Policies such as geofencing the service, pre-determined pick-up and drop-off spots, and congestion pricing are being analyzed to understand the future of mobility.

**Agent-Based Microsimulations of Shared Autonomous Vehicles in Austin using Dynamic Ride-Sharing on MATSim** Fall 2016 – Summer 2018

Supervisor: Dr. Kara Kockelman (Sponsored by TxDOT) *UT Austin*

MATSim (Multi-agent Transport Simulation), an agent-based simulation model was studied to include shared autonomous vehicle simulations. Tolling and AVs were incorporated into an existing SAV module. Several scenarios were run based on different congestion-pricing and fare policies with dynamic ride-sharing being an integral part of the analysis.

**Analyzing the Dynamic Ride-Sharing Potential for Shared Autonomous Vehicle Fleets Using Cellphone Data from Orlando, Florida** Spring 2017 – Spring 2018

Supervisor: Dr. Kara Kockelman (Sponsored by TxDOT) *UT Austin*

Cellphone data obtained for Orlando was spatially and temporally disaggregated to have a resolution of one minute and intersection-level detail. Disaggregated data was used to assess the dynamic ride-sharing potential for the region by comparing origin-destination versus en route dynamic ride-sharing. A simulation of a fleet of autonomous vehicles was used to estimate optimal fleet sizes for the region.

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## CO-CURRICULARS & VOLUNTEERING

**Corporate Outreach Coordinator**, Women's Transportation Seminars, UT Austin Student Chapter Fall 2017 - Present

**Member & Past President,** Institute of Transportation Engineers, UT Austin Student Chapter Fall 2016 – Present

**Member & Ex-Officer,** Intelligent Transportation Society of America, UT Austin Student Chapter Fall 2016 – Present

**Mentor,** Graduates Linked with Undergraduates in Engineering (GLUE) Fall 2017

**Lead Event Planner,** Texas Student Leadership Summit Fall 2017

**Core Team Member,** UT Austin Traffic Bowl Team Spring 2017 – Summer 2017

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## PEER REVIEWER - JOURNALS

*Transportation Research – Part B, Part C* • *Computers, Environment and Urban Systems* • *Transport Policy* • *Transportation* • *Transportation Research Record: Journal of the Transportation Research Board*

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## AWARDS & ACHIEVEMENTS

- Awarded the Graduate Research Award by the Airport Cooperative Research Program for the period 2018-19
- Awarded the CAS-ITE and ITS Texas scholarships
- Awarded the Texas district ITE fellowship
- Part of the UT Austin Traffic Bowl Team that won the Texas district championship in Spring 2017 and came second in the International championships in Summer 2017

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## MENTEES

Hyungseung (Jeffrey) Hahm • Evelyn Reyes (GLUE)

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