

# Cesar N. Yahia

<https://cnyahia.github.io/>

Senior Data Scientist, Aurora Innovation

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## Education:

### The University of Texas at Austin,

*Doctor of Philosophy (Ph.D.) – Civil & Environmental Engineering, Transportation Systems (4.0/4.0)* 2018– 2021

\* Research: Transportation Operations; Network Optimization; Statistical Estimation

\* Courses: Integer Programming; Mathematical Stats.; Queueing Theory; Markov Decision Proc.; Probability & Stoch. Proc.

### The University of Texas at Austin,

*Master of Science (M.S.) – Civil & Environmental Engineering, Transportation Systems (3.96/4.0)* 2018

\* Research: Data Assimilation; Traffic Assignment

\* Courses: Discrete Choice; Optimization (Linear Prog.); Sensors & Signals; Monte Carlo Methods in Stats; Network Flows

### American University of Beirut,

*Bachelor of Engineering – Civil Engineering (91.5/100)* 2016

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## Experience:

### Senior Data Scientist, Aurora Innovation

Pittsburgh, PA

*Aurora Data Science*

Nov 2021– Present

- Led the development of data tooling and processes for verification and validation of the motion planning subsystem
- Developed metrics for tracking on-road vehicle performance and autonomy development workflows: fault management, driving behavior, and sim generation
- Built pipelines for ingesting and publishing third-party construction data to inform dispatch
- Developed models that leverage market and partner data to guide Aurora’s commercialization strategy: Quantifying national trucking flows; evaluating pricing under different product models; identifying optimal terminal locations
- Applied choice modeling, market segmentation, and statistical analysis methods for autonomous ridehailing applications

### Research Assistant, The University of Texas at Austin

Austin, TX

*Advisor: Prof. Stephen D. Boyles*

2016– Nov 2021

- Developed queueing and optimization models for analyzing on-demand mobility services – with Prof. Gustavo de Veciana
- Applied data assimilation methods and large-scale geospatial analysis to investigate flood inundation – with Prof. Passalacqua & KISTERS
- Applied ensemble Kalman filtering for traffic estimation within UAV path planning algorithms – with Prof. Christian Claudel

### Data Scientist, GHD Group

Austin, TX (remote)

*GHD Digital - North American Data & Analytics Team*

Jan– May 2021

- Developed a network analysis library for decision problems that have a combinatorial number of scenarios
- Explored the use of graph databases in contamination assessment applications
- Supported the transportation/environmental teams with data extraction, visualization, and geospatial analysis

### Teaching Assistant, The University of Texas at Austin

Austin, TX

*Course: Probability & Statistics for Civil Engineers (CE311S)*

2017, 2018

- Led weekly problem solving sessions; designed and graded exams

### Research Assistant, American University of Beirut

Beirut, LB

*Advisor: Prof. George A. Saad*

2014– 2016

- Applied ensemble Kalman filters to infer soil properties from seismic data and a physical model of soil dynamics

### Research Intern, University of Illinois at Urbana-Champaign

Champaign, IL

*Advisor: Prof. Youssef M.A. Hashash*

Jun– Aug 2015

- Validated seismic simulation models and statistically analyzed outputs
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## Publications:

### Journal Publications:

6. A. Unnikrishnan, T. Zhu, D. Chauhan, C. Yahia, S. Boyles, and N. Nezamuddin. (2022) Congested medical facility location and personnel assignment. *Socio-Economic Planning Sciences* (Under Review).
5. N. Zuniga-Garcia, K. M. Gurusurthy, C. N. Yahia, K. M. Kockelman, and R. B. Machemehl. (2022) Integrating Shared Mobility Services with Public Transit in Areas of Low Demand. *Journal of Public Transportation*.

4. **C. N. Yahia**, G. de Veciana, S. D. Boyles, J. Abou Rahal, and M. Stecklein. (2021) Book-Ahead & Supply Management for Ridesourcing Platforms. *Transportation Research Part C: Emerging Technologies*.
3. **C. N. Yahia**, S. E. Scott, S. D. Boyles, and C. G. Claudel. (2021) Unmanned Aerial Vehicle Path Planning for Traffic Estimation and Detection of Non-Recurrent Congestion. *Transportation Letters*.
2. K. A. Perrine, M. W. Levin, **C. N. Yahia**, M. Duell, and S. D. Boyles. (2019) Implications of Traffic Signal Cyber Security on Potential Deliberate Traffic Disruptions. *Transportation Research Part A: Policy and Practice*.
1. **C. N. Yahia**, V. Pandey, and S. D. Boyles. (2018) Network Partitioning Algorithms for Solving the Traffic Assignment Problem using a Decomposition Approach. *Transportation Research Record*.

#### Select Conference Proceedings / Presentations:

7. N. Zuniga-Garcia, K. M. Gurumurthy, **C. N. Yahia**, K. M. Kockelman, and R. B. Machemehl. (2022) Integrating Shared Mobility Services with Public Transit in Areas of Low Demand. *101th Annual Meeting of the Transportation Research Board.*, Washington, DC. (No. 22-00072).
6. **C. N. Yahia**, N. Zuniga Garcia, R. B. Machemehl, and S. D. Boyles. (2021) CapRemap: equity analysis and impact on scooter ridership. *18th Conference on Transportation Planning Applications, Transportation Research Board*.
5. **C. N. Yahia**, and S. D. Boyles (2021). Peak-load pricing and demand management for ridesourcing platforms. *100th Annual Meeting of the Transportation Research Board.*, Washington, DC. (No. 21-03427).
4. **C. N. Yahia**, and S. D. Boyles. (2021) Peak-load pricing and demand management for ridesharing platforms. *8th International Symposium on Dynamic Traffic Assignment (DTA2020)*, deferred to Summer 2021 due to COVID-19.
3. **C. N. Yahia**, G. de Veciana, M. Stecklein, J. A. Rahal, and S. D. Boyles. (2020) Book ahead and performance management for ridesharing platforms. *99th Annual Meeting of the Transportation Research Board*, Washington, DC. (No.20-02818)
2. **C. N. Yahia**, S. E. Scott, S. D. Boyles, and C. G. Claudel. (2019) Unmanned Aerial Vehicle Path Planning for Traffic Estimation and Detection of Non-Recurrent Congestion. *98th Annual Meeting of the Transportation Research Board*, Washington, DC. (No. 19-01455).
1. V. Pandey, J. Li, **C. N. Yahia**, and S. D. Boyles. (2018) Evaluation of Active Traffic Management (ATM) Strategies under Recurring and Non-Recurring Congestion: An IH-35 Corridor Case Study. *97th Annual Meeting of the Transportation Research Board*, Washington, DC. (No. 18-06348).

#### Technical Reports (TxDOT & UTC):

3. S. D. Boyles, P. Patil, V. Pandey, and **C. N. Yahia**. (2018) Beyond Political Boundaries: Constructing Network Models for Megaregion Planning. Cooperative Mobilities for Competitive Megaregions Center report CM2-11.
2. S. D. Boyles, C. Bhat, J. Duthie, N. Jiang, F. Dias, E. Jafari, V. Pandey, A. Singh, and **C. N. Yahia**. (2017) Methods for Improving Consistency between Statewide and Regional Planning Models. Texas Department of Transportation report FHWA/TX-17/0-6900-1.
1. S. D. Boyles, C. M. Walton, J. Duthie, E. Jafari, N. Jiang, A. Khani, J. Li, J. Osorio, V. Pandey, T. Rambha, and **C. N. Yahia**. (2017) A Planning Tool for Active Traffic Management Combining Microsimulation and Dynamic Traffic Assignment. Texas Department of Transportation report FHWA/TX-17/0-6859-1.

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#### Activities & Certificates:

- **Referee:** ACM Journal on Autonomous Transportation Systems; Transportation Research Part B: Methodological; Transportation Research Part C: Emerging Technologies; IEEE Transactions on Intelligent Transportation Systems; IEEE Transactions on Control of Network Systems; Networks and Spatial Economics; Transportation Research Record: Journal of the Transportation Research Board; International Journal of Geographical Information Science; IEEE Transactions on Smart Grid; Transportation Research Board Annual Meeting
- **Presenter:** Annual Meeting of the Transportation Research Board (TRB); Annual Meeting of the Institute of Operations Research and Management Sciences (INFORMS); The International Symposium on Dynamic Traffic Assignment; TRB Transportation Planning Applications (AppCon); University of Minnesota
- **Member, The Zephyr foundation:** participated in activities that aim to advance travel analysis 2020– Present
- **Mentor, Woman in Engineering Program (WEP):** supervised 4 students studying data analytics, Kalman filtering, and mobility services (focusing on students under-represented in STEM) 2016– 2021
- **Medium:** Blog article on [transit planning equity metrics](#) featured in the [Shared Use Mobility Center newsletter](#) 2020
- **Mentor, Ronald E. McNair Scholars Program:** guided first-generation students from underrepresented communities that are interested in graduate education 2020– 2021
- **Recipient, TAB Scholarship:** selected to serve on the Tenant Advisory Board for the grad. housing community 2020
- **Winner, U.S. DOT Tournament:** first place at the [transportation technology tournament](#) (a national competition organized by the U.S. DOT and NOCoE) 2018

- **VP of Membership, ITE-UT Austin:** organized technical events; coordinated recruitment activities 2017– 2018
  - **Mentor, D-STOP UTC-UI:** guided 2 summer interns working on UTC research projects 2017
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**Skills:**

◦ **Programming languages:** Python, SQL | R, C++, Java, MATLAB | **Tools:** Docker, Airflow, dbt, AWS, statistics and optimization libraries

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