Cesar N. Yahia

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Senior Data Scientist, Aurora Innovation | cesaryahia@utexas.edu

Education:

The University of Texas at Austin,
Doctor of Philosophy (*Ph.D.*) – *Civil Engineering, Transportation Systems & Operations Research* (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 Engineering, Transportation Systems & Operations Research* (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*

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

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. Gurumurthy, **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.

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*

Skills:

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

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