

Yaren Bilge Kaya, Ph.D. | Lecturer

Columbia University | 344 Seeley W. Mudd Building | 500 W 120th St New York, NY 10027

☎ (212) 854-4715 | ✉ ybk2105@columbia.edu | in /yarenbilgekaya

🌐 github.com/yarenbilgekaya | 🌐 www.yarenbilgekaya.com

RESEARCH AND TEACHING INTERESTS

- **Methodological:** Large-scale optimization, simulation modeling, stochastic modeling, and machine learning
- **Application Areas:** Healthcare operations management, humanitarian logistics, and public service access

EDUCATION

Northeastern University

Boston, MA

PhD in Industrial Engineering

01/2019–05/2023

- **Adviser:** Dr. Kayse Lee Maass
- **Dissertation:** Operations Research and Analytics Methods to Improve Equitable Access to Public Services
- Developed mathematical models (mixed integer linear and stochastic programs) to reduce racial and ethnic disparities in public services by alleviating current capacity limitations and reducing queue abandonment

University of South Florida

Tampa, FL

MSc in Industrial Engineering

08/2017–12/2018

- **Adviser:** Dr. Devashish Das
- **Master's Thesis:** Statistical Monitoring of Queuing Networks
- Proposed control charts based on likelihood ratios to monitor change in service rates of queuing networks

Ozyegin University

Istanbul, TR

BSc in Industrial Engineering

09/2013–06/2017

- **Adviser:** Dr. Okan Orsan Ozener
- **Senior Design Project:** Inventory Management under Stochastic Demand
- Developed an inventory management plan for Henkel Beauty Care Company using (Q,r) models

ACCEPTED/PUBLISHED PEER REVIEWED PUBLICATIONS

1. **Yaren Bilge Kaya**, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, Andrew C. Trapp, and Meredith Dank (2022) “Improving Access to Housing and Supportive Services for Runaway and Homeless Youth: Reducing Vulnerability to Human Trafficking in New York City”, *IIE Transactions*, <https://www.tandfonline.com/doi/abs/10.1080/24725854.2022.2120223>
2. **Yaren Bilge Kaya**, S. Mantell, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, and Andrew C. Trapp (2022) “Discrete Event Simulation to Evaluate Shelter Capacity Expansion Options for LGBTQ+ Homeless Youth”, *Proceedings of Winter Simulation Conference*, <https://informs-sim.org/wsc22papers/106.pdf>

MANUSCRIPTS UNDER REVIEW

1. Frederick I. Miller, **Yaren Bilge Kaya**, Andrew C. Trapp, Geri L. Dimas, Renata Konrad, Kayse Lee Maass, and Meredith Dank (2022) “On the Optimization of Benefit to Cost Ratios for Public Sector Decision Making”, Preprint available at: <https://arxiv.org/abs/2212.04534>
2. **Yaren Bilge Kaya**, and Kayse Lee Maass (2023) “Queue Routing Strategies to Improve Equitable Housing Coordination in New York City”, Preprint available at: <https://arxiv.org/abs/2304.12487>

WORKING PAPERS

1. **Yaren Bilge Kaya**, and Kayse Lee Maass (2024) “Leveraging Priority-Thresholds to Improve Equitable Housing Access for Unhoused-at-Risk Youth”, Preprint available at: <https://arxiv.org/abs/2212.03777>

WHITE PAPERS

1. Geri L. Dimas, Meredith Dank, Andrea Hughes, **Yaren Bilge Kaya**, Kayse Lee Maass, Renata Konrad, (2024) “Understanding the Needs of Youth Human Trafficking Victims in New York City”, Print available at: <https://marroninstitute.nyu.edu/papers/understanding-the-needs-of-unstably-housed-youth-in-new-york-city>
2. James C. Benneyan, Micheal Rosenblatt, Basma Bargal, Shane Yap, and **Yaren Bilge Kaya** (2020) “A hospital surge capacity bed, equipment, and staff demand planning model”, Print available at: <https://www.hsye.org/covid-19-capacity-mgmt>

SCHOLARSHIPS AND AWARDS

- INFORMS 2023 Conference “The Committee’s Choice” Session: “Exploring Equity and Fairness in Public Services Administration” 10/2023
- Northeastern University College of Engineering Outstanding Graduate Research Award 04/2023
- ACM EAAMO 2022 Conference The Best Paper with Student Presenter Award 10/2022
- ACM EAAMO 2022 Conference Doctoral Consortium Travel Grant 09/2022
- ACM EAAMO 2022 Conference Doctoral Consortium Participant 09/2022
- IISE Annual 2022 Conference Doctoral Colloquium Nominee of Northeastern University 05/2022
- INFORMS 2021 Conference “The Committee’s Choice” Session: “OR and Vulnerable Populations” 10/2021
- Northeastern University College of Engineering Outstanding Graduate Teaching Award 04/2021
- Yaman Yener Memorial Graduate Scholarship 09/2019-06/2020
- Tau Beta Pi - National Engineering Honor Society Member 09/2018-Present

RESEARCH EXPERIENCE

Columbia University

New York City, New York

Lecturer

07/2023 - Present

– Understanding Gentrification and Livability in Buenos Aires:

Developing a decision-support tool to map urban livability and predict land-use transformation in Buenos Aires, integrating socioeconomic, regulatory, and spatial data. Employs operations research and machine learning to study factors driving gentrification and guide equitable urban policy.

Project partners: Terres Real Estate (Buenos Aires), Universidad Nacional de San Martín (UNSAM), and City of Buenos Aires.

– T.O.D.A.Y. (Together Organizing Data Access for Youth programs):

Designing the T.O.D.A.Y. data platform to improve service delivery for runaway and homeless youth (RHY) in NYC. Focuses on creating a unified data entry system to enhance real-time responsiveness and efficiency across various RHY organizations, streamlining service provision and resource allocation.

(Supported by NSF 24-534 Civic Innovation Challenge)

Project partners: the NYC Department of Youth and Community Development, RHY service providers, RHY, and other community, and non-profit stakeholders.

– Empowering Community-Led Well-being Measurement:

Exploring the development of a community-led well-being measurement, aiming to create a localized well-being index that addresses the shortcomings of traditional economic indicators such as GDP, unemployment rates, and inflation. This initiative empowers local policymakers by providing digital tools and a comprehensive library of well-being indicators tailored to reflect the nuanced economic realities and improve communal policy decisions.

Project partners: the U.S. Census Bureau, Harvard Business School, and other community, and non-profit stakeholders.

– **The National Platform for Outage, Welfare, and Energy Resilience (N-POWER):**

This is a comprehensive data-driven dashboard designed to present complex energy data in an accessible format for a diverse range of users. Datasets from multiple publicly available federal sources undergo detailed processing and formatting within N-POWER to effectively highlight the effects of electricity outages across the US and their impacts on various demographics.

Project partners: the U.S. Department of Energy, the U.S. Census Bureau, and other community, and non-profit stakeholders.

– **Understanding the Needs of Youth Human Trafficking Victims in New York City:**

We conducted structured interviews and surveys with RHY and organizations that fund, support, and provide services to them in New York City (NYC). Through these surveys we aim to understand the service needs of RHY and how these needs change based on different experiences and demographic characteristics.

Project partners: the NYC Department of Youth and Community Development, and other community, and non-profit stakeholders)

Operations Research and Social Justice Lab, Northeastern University

Boston, MA

Graduate Research Assistant

01/2021-07/2023

- **Capacity Expansion of New York City Shelters:** To disrupt human trafficking networks by decreasing future vulnerability and recidivism for those at-risk of trafficking, we guide a long-term, cost-effective intervention approach by developing an optimal policy for capacity deployment to shelters and associated rehabilitative services in New York City. (*Supported by NSF, Operations Engineering grant CMMI-1935602*)
- **Equitable Housing Access for New York City Shelters:** To improve equitable access to housing services for at-risk unhoused youth, we propose expanding the current housing capacity, while utilizing priority thresholds that guide decisions regarding which youth should start receiving service based on the number of beds idle in the system.
- **Routing Strategies for Equitable Service Coordination:** In an attempt to achieve equitable housing coordination, we evaluate various queue routing strategies that are previously introduced to operations research and analytics literature as housing and support service coordination strategies.
- **Modeling Effective Network Disruptions:** Modeling effective network disruptions to sex trafficking while understanding how the interventions leading to disruptions impact the victims and survivors of these networks.
- **Mayo Clinic Computed Tomography Access:** Using a multi-step approach that involves a queuing model and an integer linear program to improve computed tomography access for emergency department patients.

Healthcare Systems Engineering Institute, Northeastern University

Boston, MA

Graduate Research Assistant

01/2019-12/2020

- **COVID-19 Hospital Surge Capacity Planning:** Developed a tool to help health systems estimate and visualize 1-to-30 day ahead hospital-specific demand for medical and ICU beds, ventilators, PPE, medications, and available staff on a rolling basis.
- **Boston Children's Hospital Complex Care Process Redesign:** Installed a reliable preoperative pathway for children undergoing spinal fusion surgery with the help of predictive models, simulation modeling, and FMEA.
- **Trauma Screening of Foster Care Children:** Developed a probability and a simulation model to improve efficiency of the trauma screening process for foster care children in 12 states.

University of South Florida

Tampa, FL

Graduate Research Assistant

01/2018 - 12/2018

- **Statistical Monitoring of Queuing Networks:** Monitored service rate change in queuing networks with the help of statistical process control charts. The aim of this work was to be able to detect the point in time where the servers slow down.

TEACHING EXPERIENCE

Columbia University

Lecturer in the Discipline of Industrial Engineering and Operations Research

New York, NY

07/2023 - Present

Spring 2025 Semester

- Analytics in Practice (IEOR4524) - In-Person (**15 students**)
- Operations Research in Public Policy (IEOR4505) - In-Person (**60 students**)
- Undergraduate Research (IEOR3900) - In-Person (**1 student**)

Fall 2024 Semester

- Optimization Models and Methods (IEOR4004) - In-Person (**207 students**)
- Introduction to Probability and Statistics (IEOR4150) - In-Person (**165 students**)
- Undergraduate Research (IEOR3900) - In-Person (**5 students**)
- Master’s Research (IEOR4900) - In-Person (**1 student**)

Summer 2024 Semester

- Math in Action: Operations Research for Social Good (**22 students**)

Spring 2024 Semester

- Analytics in Practice (IEOR4524) - In-Person (**187 students**)
- Operations Research and Public Policy (IEOR4505) - In-Person (**50 students**)
- Undergraduate Research (IEOR3900) - In-Person (**3 students**)

Fall 2023 Semester

- Optimization Models and Methods (IEOR4004) - In-Person (**202 students**)
- Undergraduate Research (IEOR3900) - In-Person (**5 students**)

Northeastern University

Graduate Teaching Assistant

Boston, MA

08/2019 - 12/2020

- Northeastern University College of Engineering Outstanding Graduate Teaching Award recipient
- Stochastic Modeling (IE 4520) - Remote Learning Environment (**46 students**)
- Stochastic Modeling (IE 4520) - In-Person (**35 students**)

GUEST LECTURES

- | | |
|---|------------|
| • Introduction to Queuing Theory: A Deep Dive into Housing Applications | 04/09/2024 |
| <i>Georgia Institute of Technology, IsyE 3232: Stochastic Manufacturing and Service Systems</i> | |
| • Introduction to Queuing Theory: A Focus on Healthcare and Housing | 04/05/2024 |
| <i>Columbia University, IEOR E1000: Frontiers in OR and Data Analytics</i> | |
| • Leveraging Operations Research and Data Analytics in Energy Access and Policy | 01/25/2024 |
| <i>Columbia University, IEOR E3700: Research Immersion in OR and Data Analytics</i> | |

PRESENTATIONS

1. Adeolu Oluwaseun Ajayi, Dafne Sarfati, Jane Ziqing Zhang, Patrick Bosque Passalacqua, Isaure Pilot, **Yaren Bilge Kaya**, Yi Zhang “Developing a Community-led Wellbeing Measurement for the Bronx” *Columbia University Undergraduate Computer and Data Science Research Fair* (November, 2024)
2. Kayse Lee Maass, Baris Tezcan, Geri Dimas, **Yaren Bilge Kaya**, Thomas Sharkey, Renata Konrad, Andrew Trapp, Lauren Martin, Kelle Barrick “Co-designing solutions to societal issues with lived experts” *INFORMS Annual* (October, 2024)
3. Gabriela Gongora-Svartzman, **Yaren Bilge Kaya**, Mariana Escallon Barrios “Exploring and Maintaining Teaching Stream Careers in Academia” *INFORMS Annual* (October, 2024)
4. Tyler Perini, Léa Massé Ricard, **Yaren Bilge Kaya**, Priyank Arora, Billur Aksoy, Sulaimon Giwa “LGBTQ+ Research in ORMS” *A Webinar by the INFORMS PRIDE Forum* (August, 2024)

5. Jordan Shiff, **Yaren Bilge Kaya** “Reducing Wait Times for Mental Health Call Centers: An Operations Research Approach” *Lida Orzeck '68 Summer Research Institute Poster Session* (August, 2024)
6. **Yaren Bilge Kaya** “Use of Community Based Operations Research Methodologies to Address Vulnerable Population’s Needs” *Social Determinants of Health and Artificial Intelligence: A Think Bigger Innovations Workshop* (August, 2024)
7. Hao Lin, Leo Hu, Jack Weissman, Tejas Raj, Ziyu Zhao, and **Yaren Bilge Kaya** “The National Platform for Outage, Welfare, and Energy Resilience (N-POWER)”, *Justice Week 2023: US Department of Energy* (November, 2023)
8. **Yaren Bilge Kaya**, and Kayse Lee Maass “A Simulation-Based Approach to Improve Equitable Housing Coordination in New York City”, *INFORMS Annual* (October, 2023)
9. Renata A. Konrad, Geri L. Dimas, **Yaren Bilge Kaya**, Andrew C. Trapp, Kayse Lee Maass, Meredith Dank, and Andrea Hughes “Collecting Data in the Human Trafficking Domain: Youth-Informed and Data-Driven Recommendations for Runaway and Homeless Youth in NYC”, *INFORMS Annual* (October, 2023)
10. Renata A. Konrad, Geri L. Dimas, **Yaren Bilge Kaya**, Andrew C. Trapp, Kayse Lee Maass, Meredith Dank, and Andrea Hughes “Collecting Data in the Human Trafficking Domain: Youth-Informed and Data-Driven Recommendations for Runaway and Homeless Youth in NYC”, *INFORMS Annual* (October, 2023)
11. Frederick I. Miller, **Yaren Bilge Kaya**, Geri L. Dimas, Renata Konrad, Kayse Lee Maass, and Andrew C. Trapp “Optimizing the Benefit-to-Cost Ratio for Public Sector Decision Making”, *Joint Mathematics Meeting* (January, 2023)
12. Sophia Mantell, **Yaren Bilge Kaya**, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, and Andrew C. Trapp “Discrete Event Simulation to Evaluate Shelter Capacity Expansion Options for LGBTQ+ Homeless Youth”, *Winter Simulation Conference* (December, 2022)
13. **Yaren Bilge Kaya**, and Kayse Lee Maass, “Priority Thresholds for Equitable Housing Service Coordination”, *INFORMS Annual* (October, 2022).
14. Frederick I. Miller, **Yaren Bilge Kaya**, Geri L. Dimas, Andrew C. Trapp, Renata Konrad, and Kayse Lee Maass, “Optimizing The Benefit-to-Cost Ratio For Effective Capacity Deployment For New York City’s Homeless Youth Shelter System”, *INFORMS Annual* (October, 2022).
15. **Yaren Bilge Kaya**, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, and Andrew C. Trapp, “Improving Access to Housing and Supportive Services for Runaway and Homeless Youth: Reducing Vulnerability to Human Trafficking in New York City”, *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization* (October, 2022).
16. **Yaren Bilge Kaya**, Kayse Lee Maass, and Kalyan Pasupathy, “Improving Emergency Department Access to Computed Tomography Resources: A Multi-Step Approach ”, *IISE Annual* (May, 2022).
17. Geri L. Dimas, **Yaren Bilge Kaya**, Renata Konrad, Andrew C. Trapp, Kayse Lee Maass, and Meredith Dank, “Collecting Data in the Human Trafficking Domain: Lessons Learned from Runaway and Homeless Youth in NYC”, *IISE Annual* (May, 2022).
18. **Yaren Bilge Kaya**, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, and Andrew C. Trapp, “Reducing Vulnerability to Human Trafficking by Improving Access to Housing and Support Services ”, *INFORMS Annual* (October, 2021).
19. **Yaren Bilge Kaya**, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, and Andrew C. Trapp, “Reducing Risks of Human Trafficking: Improving Access to Housing and Supportive Services for Runaway and Homeless Youth in NYC”, *INFORMS Healthcare*(July, 2021).
20. Geri L. Dimas, **Yaren Bilge Kaya**, Renata Konrad, A. Trapp, K. L. Maass, and Meredith Dank, “Identifying Run Away Homeless Youth’s Needs: A First Step to Disrupt the Supply of HT Networks ”, *IISE Annual* (May, 2021).
21. **Yaren Bilge Kaya**, Kayse Lee Maass, Geri L. Dimas, Renata Konrad, and Andrew C. Trapp, “Increasing Access to Homeless Shelter Services for Youth At Risk of Human Trafficking”, *Equity and AI*(April, 2021).

22. Theresa Fuller, Mohit Shukla, **Yaren Bilge Kaya**, Joe East, Daniel Meyer, Samir Haydar, Jorden Peck, Nicole Nehls and James C Benneyan, “Evaluating the Impacts of Geographic Cohorting and Patient Rooming on Hospital Efficiency”, *Costas T. Lambrew Research Retreat* (April, 2020).
23. **Yaren Bilge Kaya**, Basma Bargal, and James C Benneyan, “Model-Based Analysis of Screening Policies for Trauma Experienced by Children in Foster Care”, *Improving Primary Care Through Industrial and Systems Engineering (I-PRACTISE)* (June, 2019).

SERVICE TO THE PROFESSION

- **IISE Webinar on Engagement, Outreach and Inclusion Statements: Panelist** 01/2025
Participated at a panel run by the IISE Faculty Fellows
- **Columbia University Engineering Week Professor Panel: Panelist** 04/2024
Participated at a panel run by the Society of Women Engineers
- **EAAMO Development and Fundraising Committee: Member** 10/2023 - 11/2024
I co-lead development by building strong, long-term relationships for future funding, while also managing fundraising activities for immediate financial needs for the EAAMO Community. This approach ensures our organization’s financial stability both now and in the future.
- **INFORMS Early Career Teaching Network (ECTN): Co-chair of ECTN 2024** 11/2023 - Present
The ECTN Workshop is a pre-conference workshop prior to the INFORMS Annual Meeting. During the ECTN Workshop, participants meet their fellow ECTN participants to begin forming a teaching community and learn the basics of constructing high-quality learning experiences for students.
- **MD4SG Conversations with Practitioners Working Group: Member** 02/2023 - 01/2024
This working group (CuP) aims to bring together practitioners and researchers by conducting in-depth interviews with practitioners to understand their challenges and concerns. We author and disseminate informative blog posts based on these interviews, providing valuable insights into handling prevalent issues in interdisciplinary research. <https://www.md4sg.com/workinggroups/practitioners.html>
- **EAAMO 2022 Conference: Volunteer** 10/2022
Helped with the conference logistics such as preparing social media posts, working at the registration desk, and facilitating social events.
- **INFORMS 2022: Session Chair** 10/2022
Chaired a session on Equity, Fairness, and Improving Access to Public Services.
- **The ExplOR High School Outreach Program: Mentor** 12/2021
This program gave STEM Academy of Hollywood students exposure to operations research and machine learning methods in social justice setting.
- **INFORMS 2021: Session Chair** 10/2021
Chaired a session on OR and Vulnerable Populations.
- **ORSJ Lab PhD Journal Club: Organizer** 06/2021 - 01/2023
The PhD Journal Club is an informal monthly meeting that reviews a healthcare, human trafficking or industrial engineering publication and discusses its strengths, weaknesses, implications, and/or connections to our work.

PROFESSIONAL AFFILIATIONS

- EAAMO Bridges (formerly MD4SG) Member
– Development and Fundraising Committee [10/2023 - 11/2024] 06/2021 - Present
– Conversations with Practitioners Group [02/2023 - 01/2024]
- Institute for Operations Research and the Management Sciences (INFORMS) Member
– Early Career Teachers’ Network 11/2020 - Present
– Public Sector Operations Research
– Women in Operations Research and Management Science (WORMS)
– Minority Issues Forum

- Institute of Industrial and Systems Engineers (IISE) Member
10/2018 - Present
- The Tau Beta Pi Association – Engineering Honor Society Member
09/2018 - Present

SKILLS

- **Programming:** Python, Gurobi, Matlab, R, VBA, Java, Arena Simulation Software, Flexsim
- **Tools/Techs:** LaTeX, Microsoft Office, Tableau, Canva, Lucid Chart

LANGUAGES

- **English:** Fluent
- **Turkish:** Mother tongue, native speaker
- **German:** Elementary
- **Spanish:** Elementary

MENTORING - GRADUATE

- Isaure Mari Pilot 09/2024-12/2024
- Ritwika Chattopadhyay 09/2024-12/2024
- Xinyue Zhang 04/2024-12/2024
- Burcu Ozek 06/2019-03/2023
- Nicole Nehls 06/2019-01/2020
- Theresa Fuller 06/2019-01/2020
- Yang Yang 01/2019-06/2019

MENTORING - UNDERGRADUATE

- Jordan Shiff 01/2024 - Present
- Adeolu Oluwaseun Ajayi 09/2024 -12/2024
- Dafne Sarfati 09/2024 -12/2024
- Patrick Bosque Passalacqua 09/2024 - 12/2024
- Jane Ziqing Zhang 09/2024 - 12/2024
- Hao Lin 08/2023 - 05/2024
- Tejas Raj 08/2023 - 05/2024
- Leo Hu 08/2023 - 05/2024
- Molly Hodsden 01/2023-02/2024
- Ziyu Zhao 08/2023 - 02/2024
- Jack Weissman 08/2023 - 02/2024
- Nathan Willemsen 05/2023-08/2023
- Eliza Macaulay 09/2022-06/2023
- Frederick Miller 02/2022-06/2023
- Sophia Mantell 06/2021-06/2022
- Christopher Gehrke 09/2021-06/2022
- Laurel O'Malley 09/2021-06/2022
- Klara Juliusson 09/2021-06/2022
- Matthew Dzwil 09/2021-06/2022
- Isabel Cusack 01/2021-05/2021
- Chia-Hsiang Hsu Tai 01/2021-05/2021
- John Hooper 01/2021-05/2021
- Thomas Minutella 01/2021-05/2021
- Ana Sosa 01/2021-05/2021
- Caroline T. Retzios 06/2019-08/2019
- Cassie Boutelle 06/2019-08/2019
- Nicholas Cooper 01/2019-05/2019