Najiya Fatma

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Block 3, 369, Indian Institute of Technology Delhi, India

EDUCATION

Doctoral Candidate, Industrial Engineering **July 2018 - July 2024**
Department of Mechanical Engineering, Indian Institute of Technology Delhi, India
CGPA: 9.43 on a scale of 10
Advisor: Prof. Varun Ramamohan
Thesis title: Analysis of Healthcare-Seeking Behaviour and Referral Mechanism Modelling at Public Healthcare Facilities

Bachelor of Technology, Production and Industrial Engineering **July 2014 - June 2018**
National Institute of Technology Jamshedpur, India
CGPA: 9 on a scale of 10

Research experience

Principal Project Scientist **August 2023 - May 2024**
Project: Dynamic Route Planning
Aeronautical Development Agency, Defence Research and Development Organisation (DRDO), Government of India

Research interests

Methodologies: Queueing theory, stochastic modelling, statistical modelling, machine learning, network algorithms
Application areas: Healthcare delivery systems, military operations

Honors and Awards

- Association for Computing Machinery (ACM) Grant — February 2024
- Science and Engineering Research Board (SERB) International Travel Support (ITS) — April 2023
- Prime Minister Research Fellow Travel Grant — December 2022, 2023, May 2023
- Prime Minister Research Fellowship (PMRF), Government of India — July 2018 - July 2023
- Graduate Aptitude Test in Engineering (GATE) - All India Rank 9 — March 2018

Courses done

Probability and Statistics; Stochastic Modelling and Simulation; Introduction to Operations Research, Non-linear Optimisation; Advanced Operations Research; Industrial and Systems Engineering

Language and Tools

Python, R, MINITAB, SPSS, MATLAB, MS-OFFICE, LaTeX

Teaching Assistant

- IIT Delhi: Operations Research, Supply Chain Management, Project Management — August 2018 - April 2023
- G.B.Pant Engineering College, Delhi: Simulation Modelling of Service Systems — August 2022 - April 2023

Publications

Book chapter

1. Najiya Fatma, Pranav Shankar Girish, Varun Ramamohan (2024). Simulation and Machine Learning Based Real-Time Delay Prediction for Complex Queuing Systems. In: Fakhimi, M., Mustafee, N. (eds) Hybrid Modeling and Simulation. **Simulation Foundations, Methods and Applications. Springer, Cham**. DOI:10.1007/978-3-031-59999-6810

Journal articles

1. Najiya Fatma, Varun Ramamohan. Healthcare seeking behavior among patients visiting public primary and secondary healthcare facilities in an urban Indian district: A cross-sectional quantitative analysis. **PLOS Global Public Health**, 2023, 3(9), e0001101. DOI:10.1371/journal.pgph.0001101.
2. Najiya Fatma, Varun Ramamohan. Patient Diversion Using Real-time Delay Predictions Across Healthcare Facility Networks. **OR Spectrum**, 2023; 45:437-476. DOI:10.1007/s00291-022-00704-w.
3. Aparna Venkataraman, Najiya Fatma, Sisira Edirippulige, Varun Ramamohan. Facilitators and Barriers for Telemedicine Systems in India from Multiple Stakeholder Perspectives and Settings. **Telemedicine and e-Health**, 2024, 30(5), 1341-1356. DOI:10.1101/2328898010
4. Najiya Fatma, Kaveri Kala, Varun Ramamohan. Towards Mitigating Overcrowding in Urban Indian Healthcare Facilities: Stakeholder Perception Analysis for Existing and Potential New Patient Referral Mechanisms. **Under review**.
5. Najiya Fatma, Varun Ramamohan. Healthcare Facility Assignment using Queueing-theoretic and Simulation *cum* Machine Learning Based Real-Time Length of Stay Predictors. **In preparation**

Peer-reviewed conference proceedings

1. Najiya Fatma, Varun Ramamohan. A Generic Modeling Approach Towards Simulating an Urban Primary and Secondary Healthcare Facility Network. **Proceedings of the 2023 Annual Modeling and Simulation (ANNSIM) Conference**, May 23—26, Ontario (Canada), pp. 1–12, IEEE Press. DOI: 10.10155357/0010837400003117.
2. Najiya Fatma, Varun Ramamohan. Outpatient Diversion using Real-Time Length of Stay Predictions. **Proceedings of ICORES 2022: 11th International Conference on Operations Research & Enterprise Systems**, pp. 56–66, SCITEPress. DOI: 10.5220/0010837400003117.
3. Najiya Fatma, Varun Ramamohan. Patient Diversion Across Primary Health Centers Using Real-Time Delay Predictors. **2021 Institute of Industrial & Systems Engineers Annual Meeting Proceedings**, May 22–25, pp. 441-446, Institute of Industrial & Systems Engineers. Preprint: arXiv:2101.11074.
4. Najiya Fatma, Mohd Shoaib, Navonil Mustafee, Varun Ramamohan. Primary Healthcare Delivery Network Simulation Using Stochastic Metamodels. **Proceedings of the 2020 Winter Simulation Conference**, December 13–16, Orlando FL (USA), pp. 818-829, IEEE Press. Invited paper. DOI: 10.1109/WSC48552.2020.9384069.

Poster presentations and selected talks

1. Najiya Fatma, Varun Ramamohan. Real-Time Public Healthcare Facility Assignment Using Lengths of Stay Prediction. **56th Annual Convention of Operational Research Society of India** (2023-ORSI), 18-20, December 2023, IISc Bangalore, India.
2. Najiya Fatma, Pranav Shankar Girish, Varun Ramamohan. Real-Time Delay Prediction for Kidney Transplantation System. **2023 Winter Simulation Conference**, December 10-13, San Antonio, Texas, USA.
3. Najiya Fatma, Varun Ramamohan. Analytical and Simulation-Driven Machine Learning Methods for Generating Real-Time Outpatient Length-of-Stay Predictions. **2022 Winter Simulation Conference**, December 11-14, Singapore. Extended abstract.

4. Najiya Fatma, Varun Ramamohan. Real-Time Delay Prediction based Patient Diversion Across Healthcare Facility Networks. **INFORMS 2021 Annual Meeting**, October 24 – 27, California, USA.

Technical report

1. Najiya Fatma, Arya TR, Varun Ramamohan. Dynamic Route Planning for Combat Aircraft using Network Optimization Methods. November 2023.

References

1. Varun Ramamohan
   Associate Professor, IIT Delhi
   email id: varunr@mech.iitd.ac.in
2. S. G. Deshmukh
   Professor, IIT Delhi
   email id: deshmukh@mech.iitd.ac.in
3. Prem Vrat
   Emeritus Professor, IIT Delhi
   email id: premvrat@gmail.com