

Md Abdul Quddus

Department of Engineering & Technology
Southeast Missouri State University
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Education

- PhD in Industrial & Systems Engineering** December, 2018
Mississippi State University, Starkville, MS, USA
- Thesis Title: “Models and Algorithms to Solve Electric Vehicle Charging Stations Designing and Managing Problem under Uncertainty”.
 - GPA: 3.93 / 4.0
- Master of Engineering Science in Industrial Engineering** Aug 2014- Jun 2015
Lamar University, Beaumont, TX, USA
- Attended Master Program and Transferred to Mississippi State University
- Bachelor of Science in Engineering (BSc) in Industrial & Production Engineering** May, 2011
Khulna University of Engineering and Technology (KUET), Khulna, Bangladesh
- GPA: 3.66 / 4.0
 - Merit Position: **First**(out of 26 students)

Employment

- **Southeast Missouri State University**, Cape Girardeau, MO USA Aug 2023-Present
Assistant Professor
 - Teaching and advising undergraduate and graduate students.
- **FedEx Express**, Memphis, TN USA May 2022-Aug 2023
Senior Operations Research Advisor
 - Developing the database for the off-street network travel time and distance for individual customer address. This data set will be input of the last mile optimization (i.e., P & D model).
 - Performing what-if scenarios on last mile delivery and analyzing the impact on the routes, hours, and miles. Interpreting the outcome to the Executive Management.
 - Developing Deep Learning model on assigning on-call pickups to the FedEx routes considering various business parameters.
 - Data cleansing, validating, processing, analyzing, and identifying various routes and stop metrics from the GPS data on Azure.
 - Researching on the ML model on predicting the FedEx stops at zip level.
- **FedEx Express**, Memphis, TN USA May 2021-Apr 2022
Operations Research Advisor
 - Developed ML model on characterizing FXE stations based on various metrics for routes of the stations.
 - Designed FedEx last mile courier delivery network by utilizing ArcGIS network analyst and Google VRP and interpreting the results to the internal customers.
 - Developed and maintaining multiple backend data processing modules/tools with Spark for data pipelines hosted on Azure.
- **FedEx Express**, Memphis, TN USA Dec 2018-Apr 2021
Senior Operations Research Analyst
 - Developed and analyzed optimization model based on Data Envelopment Analysis to compare performance of FedEx Express delivery routes.
 - Developed and implemented drone nest location selection optimization model for FedEx package delivery.
 - Designed and implemented various geospatial techniques (e.g., GWR, Hotspot analysis, spatial clustering, interpolation) to analyze and interpret characteristics of GPS data.
 - Designed and developed model to identify FedEx Express facilities that can maximize customer coverage and reduce total costs.
 - Analyzed nationwide medical facilities historical deliveries and provided summarized report to the Executive management prior initiating the COVID-19 vaccine delivery. This report supports system form for designing air network.
 - Researched, analyzed, and validated GPS data (both for mobile and in-vehicle data).
 - Developed Optimization model to optimally assign zips to stations and stations to ramps. This model reduced routes and on-road hours, balanced volume across the FedEx stations, and improve network efficiency.
 - Performed data analysis, produce reports, and undertook projects to support internal customers and business operations.

- **Winston Plywood & Veneer, LLC**, Louisville, USA
Reliability Intern May 2018-Aug 2018
 - Conducted data analysis to estimate the weekly production downtime of various machine centers.
 - Reduced 64% AW68 lubricant usage on Hydraulic Power Unit (HPU).
 - Improved maintenance operation's performance by developing scheduling optimization model.
- **Department of Industrial & Systems Engineering**, Mississippi State University, USA
Research Assistant August 2015- May 2018

Major Accomplishments:

- **Research with FedEx:** May 2017- Apr 2018
 - * Improved material flow efficiency in the FedEx Memphis Hub by developing simulation model using FlexSim.
 - * Conducted data analysis to estimate and validate model parameter using collected data.
 - * Conducted sensitivity analysis and identified optimum scenarios to improve the operations.
- **Engineering Research Development Center (U.S. Army):** Aug 2016-Apr 2017
 - * Conducted economic analysis of the inland river system and developed stochastic model to minimize total system costs.
- **ANALYTICS & OPTIMIZATION LABORATORY:** August 2015- May 2018
 - * Developed stochastic models for biomass supply chain management under supply uncertainty.
 - Reduced biomass transportation cost from \$45.30/ton (deterministic equivalent solution) to \$41.39/ton (stochastic programming solution) if the biomass seasonality and uncertainty are taken into consideration.
 - * Developed collaborative energy sharing optimization model with an integration of charging stations and commercial buildings.
 - Reduced 14.24% total network cost when integrated model is considered.
 - * Developed optimization model considering load congestion and power demand uncertainty.
 - Opened large size charging stations, increased number of stored batteries to cope with higher congestion costs.
 - * Simulated Starkville MS city transit bus routing system and developed optimization model for locating charging station.
 - Determined charging station locations with optimization model and developed simulation model to evaluate the locations using FlexSim.
- **Khulna University of Engineering & Technology**, Khulna, Bangladesh
Lecturer July 2011-Aug 2014
 - Taught Industrial Production Engineering and Leather engineering related courses to the undergraduate students.
 - Supervise research projects of the undergraduate students.
- **ELECTRO GROUP**, Dhaka, Bangladesh
Production Engineer April 2011-June 2011
 - Applied lean manufacturing, Kaizen, and 5S to increase productivity in the automobile battery production line.
- **BANGLADESH KNITWEAR MANUFACTURERS & EXPORTS ASSOCIATION**, Dhaka, Bangladesh
Intern May 2010-June 2010
 - Reduced 62% Defects per Hundred Units (DHU) and 30% work-in-progress (WIP) through Kaizen Breakthrough

Projects

Build a recommendation system to recommend the best Amazon products to users

- Recommended the best Amazon products available to users based on past rating data using recommendation systems techniques.

Recognize house number digits from street view images using Neural Networks

- Recognized street view housing number digits using artificial and convolutional neural networks.

Predict the conversion of leads to customers and forecasting the stock prices

- Identified which leads are more likely to convert to paid customers based on attributes of leads and their interaction details.
- Forecasted the stock prices for the next 24 months using time series.

Predict house prices in Boston and predicting hotel bookings cancellations

- Predicted house prices in the Boston metropolitan area based on the features of the property and its locality using regression techniques.
- Predicted hotel booking cancellations based on reservation details and helping formulate profitable policies for cancellations and refunds.

Apply dimensionality reduction on the Auto-mpg dataset and segmenting bank customers

- Applied dimensionality reduction techniques and visualizing the data in lower dimensions to extract insights
- Segmented a bank's customers to help the bank upgrade the service delivery model and ensure that customers' queries are resolved faster.

Analyze marketing campaigns to help the CMO devise the next best marketing strategy

- Analyzed marketing campaign and sales data to address important business questions related to customer demographics, product preferences, channel performances, etc., and helped the Chief Marketing Officer in devising the next best marketing strategy.

Relevant Major Courses

- Machine Learning, Azure Cloud Databricks Apache Spark ML, Machine Learning with Time Series Data, Building ML model in Spark, Scalable ML with Apache Spark, Spark Programming, Scalable Deep Learning with TensorFlow and Apache Spark, The Ultimate Hands-on Hadoop, Hands-on Google cloud Platform, ArcPy for Python Developers using ArcGIS Pro, ArcGIS Desktop for Spatial Analysis, Data Analysis, Regression Analysis, Operations Research, Heuristics in Optimization, Nonlinear Programming, Network Flow & Dynamic Programming.
- **Certifications** Applied Data Science Program from MIT, Complete Pandas Bootcamp, Python for Data Science, Spatial Data Science, Machine Learning, and ArcGIS for Data Science

Software Skills

- **Python, C++, GAMS, and GUROBI/CPLEX**
 - Strong coding experience on analyzing large structured and unstructured data.
 - Solved complex mathematical models (i.e., linear programming, mixed-integer programming, and stochastic programming).
 - Improved performance of many existing algorithm (e.g., Constraint Generation, Progressive Hedging, Scenario Decomposition, Sample Average Approximation, Rolling Horizon Algorithm etc.).
- Strong working experience in python packages e.g., **Scikit-learn, SciPy, NumPy, Pandas, Beautiful Soup, StatsModels, Keras, TensorFlow, Matplotlib, Seaborn, dplyr, ggplot**
- Experience working in Big data technologies like **Python, Apache Spark, GeoSpark, Apache Sedona, ESRI BDT, Apache Zeppelin, Azure, Azure Databricks, Google Cloud Platform, Hadoop, Hive, SQL, Spark SQL, Nexus Chameleon, Teradata, GeoAnalytics Desktop**
- Very Strong working experience in **ArcGIS Desktop, ArcGIS Pro** environment with arcpy and spatial analyst, network analyst, and spatial statistics tools
- Data Visualization: ArcGIS Pro (ArcPy, Spatial analyst, Network analyst, Spatial statistics), Tibco Spotfire, Tableau, Microsoft Power BI.
- **SAS EG, R, and MATLAB**
 - Extensive coding experience.
 - Applied statistical tools to provide data mining solutions for big data structures.
 - Used MATLAB and R for implementing classification and clustering methodologies to big data structures.
- Proficient in Microsoft Office programs (i.e., **Microsoft Excel, Access, PowerPoint, VBA**, etc.)
- Strong working experience in **UNIX** environment
- Proficient in **Structured Query Language (SQL)**
- Other software: **FlexSim (Certified at MSU), LATEX, Inkspace**

Publications

Selected Referred Publications

13. **Quddus M.A.**, Shahvari, O., Marufuzzaman, M., Eksioğlu, S. D., Castillo-Villar, K. K. (2021) "Designing a reliable electric vehicle charging station expansion under uncertainty." **International Journal of Production Economics**, 236, 108132. <https://www.sciencedirect.com/science/article/abs/pii/S0925527321001080>
12. Kabli M., **Quddus M.A.**, Nurre S.G., Marufuzzaman M. (2020) "A stochastic programming approach for electric vehicle charging station expansion plans." **International Journal of Production Economics**, 220, 107461. <https://www.sciencedirect.com/science/article/pii/S0925527319302713>
11. **Quddus M.A.**, Kabli M., Marufuzzaman M. (2019) "Modeling electric vehicle charging station expansion with an integration of renewable energy and Vehicle-to-Grid sources." **Transportation Research Part E: Logistics and Transportation Review**, 128:251-279. <https://www.sciencedirect.com/science/article/pii/S136655451830485X>
 - Received 2017 INFORMS ENRE Best Student Paper Award (ENRE: Energy, Natural Resources, and the Environment Section) <https://www.informs.org/Recognizing-Excellence/Award-Recipients/Abdul-Quddus>

10. **Quddus M.A.**, Yavuz M., Usher J.M., Marufuzzaman M. (2019) “Managing Load Congestion in Electric Vehicle Charging Stations under Power Demand Uncertainty.” **Expert Systems with Applications**, 125:195-220. <https://www.sciencedirect.com/science/article/pii/S0957417419301022>
9. **Quddus M.A.**, Shahvari O., Marufuzzaman M., Usher J.M., Jaradat R. (2018) “A Collaborative Energy Sharing Optimization Model among Electric Vehicle Charging Stations, Commercial Buildings, and Power Grid.” **Applied Energy**, 229:841-857. <https://www.sciencedirect.com/science/article/pii/S0306261918311735>
8. Poudel S.R., Marufuzzaman M., **Quddus M.A.**, Chowdhury S., Bian L., Smith B.K. (2018) “Designing a Reliable and Congested Multi-modal Facility Location Problem for Bio-fuel Supply Chain Network.” **Energies**, 11(7):1-24. <http://www.mdpi.com/1996-1073/11/7/1682/pdf>
7. Marino C., **Quddus M.A.**, Marufuzzaman M., Cowan M., Bednar A.E. (2017) “A Chance-Constrained Two-Stage Stochastic Programming Model for Reliable Microgrid Operations under Power Demand Uncertainty.” **Sustainable Energy, Grids and Networks**, 13:66-77. <https://www.sciencedirect.com/science/article/pii/S2352467717300176>
6. **Quddus M.A.**, Chowdhury S., Marufuzzaman M., Yu F. (2017) “A Two-Stage Chance-Constrained Stochastic Programming Model for a Bio-fuel Supply Chain Network.” **International Journal of Production Economics**, 195:27-44. <https://www.sciencedirect.com/science/article/pii/S0925527317303031>
5. Poudel S.R., **Quddus M.A.**, Marufuzzaman M., Bian L. (2017) “Managing Congestion in a Multi-Modal Transportation Network under Biomass Supply Uncertainty.” **Annals of Operations Research**, 1-43. <https://link.springer.com/article/10.1007/s10479-017-2499-y>
4. **Quddus M.A.**, Hossain N.U.I., Marufuzzaman M., Jaradat R.M., Roni M.S. (2017) “Sustainable Network Design for Multi-purpose Pellet Processing Depots under Biomass Supply Uncertainty.” **Computers & Industrial Engineering**, 110:462-483. <https://www.sciencedirect.com/science/article/pii/S036083521730253X>
3. **Quddus M.A.**, Ahsan A.N. (2014) “A Shop-floor Kaizen Breakthrough Approach to Improve Working Environment and Productivity of a Sewing Floor in RMG Industry.” **Journal of Textile and Apparel, Technology and Management**, 8(4). <http://ojs.cnr.ncsu.edu/index.php/JTATM/article/view/4780>
2. Rashed M.S., Saha R.K., **Quddus M.A.** (2014) “Limitation to implement Green Supply Chain Management in Bangladeshi Industries Perspective.” **Journal of Engineering Science of KUET (JES)**, 4(1):147-153.
1. Ahsan A.N., **Quddus M.A.**, Arif-Uz-Zaman K. (2012) “Opportunities and Implications of Six Sigma for Bangladeshi Industries: Case Study on a Cable Manufacturing Organization.” **Global Journal of Research In Engineering**, 12(2-A). <https://engineeringresearch.org/index.php/GJRE/article/view/388>

Working paper

1. “Designing a Reliable Electric Vehicle Refueling Station Location Problem under Load Congestion”. with Fathi M., and Pardalos, P.M.

Conference Proceedings

5. Poudel S.R., **Quddus M.A.**, Chowdhury S., Marufuzzaman M., Bian L., Smith B. (2017) “Designing A Reliable and Congested Network for Biofuel Supply Chain Network.” In: Proceeding of the 96th TRB Annual Meeting, 8-12 January, Washington D.C., USA.
4. Nur F., Chowdhury S., Bhuiyan T.H., **Quddus M.A.**, Jaradat R.M., Purnell R. (2016) ” Assessing the Efficiency of 4-Way Stops Compared to Traditional Traffic Signals: A Simulation Approach ”. Proceedings of the 2016 Industrial and Systems Engineering Research Conference, (ISERC) May 21-24, Anaheim, CA, USA.
3. **Quddus M.A.**, Ahmed A. (2014) “Green lean approach to minimize the environmental wastes of cement industry.” International Conference on Mechanical, Industrial and Energy Engineering, 26-27 December, Khulna, Bangladesh.
2. **Quddus M.A.**, Ahsan A.N., Rahman A. (2012) “Collaborative Supply Chain Practices and Prospect of Companies in Bangladesh.” In: Proceeding of the 3rd International Conference on Industrial Engineering and Operations Management (IEOM), 3-6 July, Istanbul., Turkey. 1897-1906.
1. Ahsan A.N., **Quddus M.A.**, Sultana N. (2012) “A Model for Optimizing the Multi-Item Aggregated Order Quantity in a Two-Level Supply Chain: Centralized and Decentralized Perspective.” In: Proceeding of the 3rd International Conference on Industrial Engineering and Operations Management (IEOM), 3-6 July, Istanbul., Turkey. 1907-1912.

Conference Presentations

13. Marufuzzaman M., **Quddus M.A.**, Shahvari O. (2018) ”A Collaborative Energy Sharing Optimization Model between Charging Stations and Buildings”. 2018 Industrial and Systems Engineering Research Conference, (ISERC) May 19-22, Orlando, FL, USA.
12. **Quddus M.A.**, Shahvari O., Vaghani A., Marufuzzaman M. (2018) ”Designing a Reliable Electric Vehicle Charging Station Expansion under Uncertainty”. 2018 Industrial and Systems Engineering Research Conference, (ISERC) May 19-22, Orlando, FL, USA.

11. **Quddus M.A.**, Kabli M., Marufuzzaman M. (2017) “Optimizing Electric Vehicle Charging Station Expansion Decisions with an Integration of Renewable Energy and Vehicle-to-grid Sources.” INFORMS Annual Meeting, 22-25 Oct., Houston, TX,USA.
10. **Quddus M.A.**, Marufuzzaman M., Usher J.M., Yavuz M. (2017) “Managing Electric Vehicle Charging Station Congestion under Uncertainty.” INFORMS Annual Meeting, 22-25 Oct., Houston, TX,USA.
9. **Quddus M.A.**, Marino C., Marufuzzaman M. (2016) “A Chance-Constrained Two-Stage Stochastic Program for a Reliable Microgrid System.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN,USA.
8. **Quddus M.A.**, Chowdhury S., Marufuzzaman M. (2016) “A Two-Stage Chance-constrained Stochastic Programming Model for a Bio-fuel Supply Chain Network with Uncertain Biomass Supply.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN,USA.
7. **Quddus M.A.**, Marino C., Marufuzzaman M., Hu M. (2016) “Developing a CCHP-Microgrid Operation Decision Model under Uncertainty.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN,USA.
6. Poudel S.R., **Quddus M.A.**, Chowdhury S., Marufuzzaman M., Bian L. (2016) “Stochastic Model For Locating Multiple Type Recharging Station Under Flow Uncertainty.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN,USA.
5. **Quddus M.A.**, Hossain N.U.I., Marufuzzaman M., Jaradat R. (2016) “Sustainable network Design for Multi-purpose Pallet Processing Depots under Biomass Supply Uncertainty.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN,USA.
4. Poudel S.R., **Quddus M.A.**, Chowdhury S., Marufuzzaman M., Smith B., Bian L. (2016) “Designing A Reliable And Congested Multi-modal Facility Location Problem For Bio-fuel Supply Chain Network.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN, USA.
3. Kabli M., **Quddus M.A.**, Marufuzzaman M.,(2016) “A Stochastic Programming Approach for EV Charging Station Expansion Plans.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN, USA.
2. Chowdhury S., Kabli M., **Quddus M.A.**, Marufuzzaman M., Bian L., (2016) “Chance-constrained Stochastic Programming Model for Locating Charging Stations under Uncertainty in Green Power Availability.” INFORMS Annual Meeting, 13-16 Nov., Nashville, TN, USA.
1. Poudel S.R., **Quddus M.A.**, Marufuzzaman M., Bian L., (2015) “Managing Congestion in a Multi-Modal Transportation Network Under Biomass Supply Uncertainty.” INFORMS Annual Meeting, 1-4 Nov., Philadelphia, PA, USA.

Honors and Awards

- Received FedEx Express Bravo Zulu Award in 2021.
- Received FedEx Express Leadership Excellence Award in 2021.
- Received FedEx Express Bravo Zulu Award in 2019
- Received 2017 INFORMS “ENRE Best Student Paper Award” (ENRE: Energy, Natural Resources, and the Environment Section). [Link](#).
- Received Travel Assistance Grant for Graduate Students (TAGGS) for Oral Presentation at Professional Conference, Mississippi State University, 2017
- Bagley College of Engineering Travel Grant, Mississippi State University, 2016
- Achieved 1st Place of the Artelys Knitro INFORMS 2016 Contest Consisting of Solving the Non-linear Optimization Problem.
- Acquired Best Undergraduate Student Paper Award, KUET Excellence Foundation, 2009.
- Awarded University Scholarship for Outstanding Result in Undergraduate Level (Each Semester from 2007-2011).
- Achieved Middle school level Scholarship, Bangladesh, 2001.
- Placed 2nd in the Entire District at Elementary Level Scholarship, Bangladesh, 1998.

Professional Affiliations and Services

INFORMS Student Chapter at Mississippi State University, USA

- VP of Corporate Relations January 2018-Present
- VP Event Relations August 2015-December 2017

Session Chair:

- INFORMS Annual Meeting 2017: Network Design October, 2017
- INFORMS Annual Meeting 2016: Stochastic Optimization November 2016

Journal Reviewer: *Optimization Letters, Computers & Industrial Engineering, Sustainability, Energies, eTransportation, International Journal of Energy Research, International Journal of Engineering and Technology Innovation, International Journal of Energy and Environmental Engineering, Mathematics*

Book Chapter Reviewer: *Large Scale Optimization in Supply Chain & Smart Manufacturing: Theory & Application Springer Optimization and its Applications*

Membership in Professional Organizations:

- INFORMS August 2015-current
- INFORMS Energy, Natural Resources, and Environment (ENRE) Group November 2017-current
- Institute of Industrial Engineers (IIE) September 2018-current
- The Institution of Engineers, Bangladesh: IEB May 2011-current

Volunteer on Mapathon to support American Red Cross organization:

- Helped to map areas where humanitarian organizations are trying to meet the needs of vulnerable people, September 2019

Professional Websites

- **LinkedIn:** <https://www.linkedin.com/in/abdulrussellquddus/>
- **Google Scholar:** <https://scholar.google.com/citations?user=fLF9vJ0AAAAJ&hl=en>
- **ResearchGate:** https://www.researchgate.net/profile/Md_Abdul_Quddus

REFERENCES

Available upon request.

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