Dear Members of the selection committee,

I am writing to apply for the Black Trailblazer in Engineering workshop at Pursue Engineering. I have completed my PhD in Industrial and Systems Engineering from Mississippi State University with a specialization in Systems Engineering and Resilience & Risk Analytic. I am highly interested in joining this workshop as it will be a great way widen my network not only with noteworthy faculties in engineering but also with representatives from key funding agencies such as NSF, and AFOSR.

I believe that networking is not about just following the leading faculties on social media sites, commenting on their updates, and keeping up to date with the latest embedded systems applications. Sure one can learn a thing or two about the newest trend by following them, but it won't be of much help. If I really want to use my network to spark new ideas and fast-track my way up the ladder, I have to establish a strong network of faculties and carrying out research in cooperative partnerships. This workshop will be a great way to share my ideas and thoughts with the leading black faculties and get advice and support, thereby embracing the concept of giving and taking. Building and maintaining a strong network of relevant contacts will help me grow my knowledge, become more ingrained in academia, align myself with others who have more knowledge and experience, and the opportunity to mentor someone more junior. Besides, maintaining a far-reaching network could open the door to countless opportunities. The panel discussions with leading experts can give my career a jump start or even help to pursue a new direction. The network that I will be able to expand from this workshop will serve me as a resource center to explore new learning opportunities, research prospects, and job opportunities. A well-maintained network will explode with information that can be used to land better jobs, secure research funding early in the career. Apart from this, the opportunity to pitch my research and teaching plans in front of the program managers form funding agencies, not to mention the advice from them to improve proposal will be very beneficial for my future career as a faculty.

It is important to note that diversity in the workplace is less about where someone is born or what their race is and more how a group of people with diverse background learn, teach, and communicate with one another. In my past positions I have worked with diverse populations and encouraged the success of a cross-cultural environment. As a part of the international student advisory board, I focused on organizing programs to advocate for members of international, Hispanic/Latina, and LGBTQ+ groups along with other marginalized students on campus. I was the secretary of International Student Advisory Board (ISAB) at Mississippi State University and sought to help new international students have a smooth transition from their countries to student life at the university. Feedback from last year indicates that the information and advice from liaisons helped a lot of new students, and they were able to make new friends through their interactions. With my committee members, I have organized different seminars and talks such as "chat and

chew", coffee culture, meditation sessions, international fiesta, international student insight day, and global night through the year. In these seminars, we invited different keynote speakers to raise awareness about gender, race, social class, sexual orientation, and financial literacy. These brief orientation sessions also provided existing students with specific information, rights, and resources they need to adjust to student life here. As a part of International Student Advisory Board, I participated in different diversity and inclusion trainings to develop in depth knowledge, more resources, and confidence to support individuals who need our help. In addition, I also volunteered as an executive board member/general member for different student organizations and community services such INFORMS, Habitat for Humanity, Maroon Volunteers, and Bangladesh Student Associations. As an applicant with an international background, I am personally able to isolate the challenges faced by members of a diverse population. My own experiences have given me the opportunity to appreciate the necessity for diversity in the workplace. It is my hope that because of blend of my background and experience, I will be able to bring fresh experiences and viewpoints while simultaneously promoting the inclusion of those different from mine.

Sincerely,

Dr. Niamat Ullah Ibne Hossain
Post-Doctoral Associate
Mississippi State University
Miss. State, MS-39762

Research and Education Plan

Niamat Ullah Ibne Hossain

Research Interest

- Methodologies:

  i. System Engineering, Systems Engineering Education, Model based Systems Engineering, Systems Thinking.
  ii. System Resilience Analytics; System Risks, Sustainability, and Reliability Assessment
  iii. Data Driven Decision Making under Uncertainty

- Application Areas:

  i. Complex System Exploration, Systems Architecture, and Engineering Management
  ii. Critical Infrastructures (Transportation System, Smart Energy System, Waterway Port, Oil and Gas Industry, and Security Services)
  iii. Supply Chain Management, Cyber-Physical Systems

Measuring Performance of System Engineers Based on the System Attributes

My current research is motivated by a desire to expand our current understanding of how engineers, managers, and decision makers deal with increasingly complex system problems (high levels of complexity, ambiguity, and uncertainty). Complemented by my doctoral studies, I am exploring the development of a new instrument to assess the performance of systems engineers based fundamental attributes of the systems engineering. This instrument would provide a baseline to understand the current state of the systems engineering skills for a systems engineer and indicate developmental areas to enhance those skills. The outcome of this instrument will generate a unique profile for individual systems engineers and allows engineers to improve their systems engineering skills to better deal with the increasing intricacies of the design and operation of complex systems. Appreciation of this framework will also serve as a benchmark to trace out the weakness of individual systems engineers. Once 'weak' areas are identified they can serve to: (1) support developmental areas for an engineering, (2) identify potential vulnerabilities in performance of work assigned to systems engineers that may be performing 'systems' engineering activities for which they are not sufficiently prepared, and (3) identify where additional/different skill sets might need to be added to supplement systems engineering activities.

Risk, Resilience, and Sustainability Management for Critical Infrastructure

Critical infrastructures are often susceptible to a diverse range of risks, including natural disasters, malicious cyber-attacks, technological factors, organizational factors, economic factors, and human error. The conditions of any disruptive event can be broadly characterized as intense, unsettling, and severe under both pre-and post-disaster applications. The consequences of disruptions often lead to unanticipated system behaviour and reduced overall system resilience. For instance, the complex nature and the dynamic interactions between the system components challenge the achievement of optimal operations for system infrastructure and causes economic loss. Therefore, different federal agencies, along with national security partners, have emphasized the development of robust approaches to address potential risks associated with the critical infrastructure system. Practitioners are now concerned with developing a solid structure, using resilience-based approaches, that could withstand and recover from any disturbance. Hence, I have dedicated myself digging into this area to develop different risk assessment, sustainability and resilience

enhancement framework for different critical infrastructures by using a systemic quantitative approach, which strongly believe can turn to be a breakthrough innovation for the 21st century in risk and resilience management for critical infrastructures.

Leveraging Systems Thinking to Enhance the Holistic Formation of Engineers (System Engineering Education: NSF)

At Mississippi State University (MSU), I currently work on a project that is funded by the National Science Foundation (NSF) and headed by my advisor Dr. Raed M Jaradat. This project aims to understand the ability of engineering students to think at a system level in order to better fit their future engineering careers. The project provides essential insights into the preparation of 21st-century engineering students with respect to systems thinking capability. By comparing student capabilities to the needs of employers, the current state of engineering education can be evaluated and modified. The project addresses a recognized challenge of current engineering formation: how to prepare future holistic engineers to better handle complex multidisciplinary problems. While systems thinking has been recognized as one of the essential skills for future engineers, measurement of systems thinking capability in this project will provide new insights. The project has three primary tasks: 1) evaluate current engineering students' systems thinking capability using a previously validated survey instrument and connect systems thinking capability to the established theoretical frameworks (inductive and deductive reasoning), 2) identify and explore various cognitive, demographic, academic, and intuitional factors that influence systems thinking capability and 3) evaluate employers' needs to investigate gaps between students' systems thinking capacity and employers' needs.

Future Research

Stemming from and following the focus of my doctoral research, As a faculty trailblazer, i will be extending the initial research to develop a generalizable tool that can be useful in expanded real-world complex problems. The results from this follow-on research will provide individuals with research-based guidance to classify the level of systems skill for the engineers who must become more effective in working within multidisciplinary teams on complex problems. In addition, my future research plans include the study and exploration of the effects of demographic factors (age, sex, race) on the state of system skill at the individual level to deal with supply chain problems. I also plan to use Model Based Systems Engineering (MBSE) and system dynamics to study the effect of complex interdependency among critical infrastructure (CI) especially focusing on cyber security issues. I also have a concrete plan to extend my sustainability, risk, and resilience-based research in several directions. For instance, I am working to develop a decision-theoretic framework to reduce the impact of cyber intrusion for different critical infrastructure in order to achieve higher resiliency.

Although affirmative actions for specific marginalized groups are important, I believe that diversity, inclusion, and equity work is also important for research with different backgrounds to have meaningful conversations and educate each other about themselves, and to pursue equality and equity in the community together. From this standpoint, my goal is to create a research platform on campus where students with different race and ethnicity express themselves and exchange perspectives of research with others in a civic manner. I am attentive to diversity fatigue and plan to design activities, workshops, and dialogues to end diversity fatigue and minimize resistance to having these conversations for the research program. When confronted with difficult situations, my experience and personality allow me to remain calm, deploy methods for bringing the community back together, and avoiding situations from becoming hostile, unsafe, and unproductive for any research related discussions and work.

Niamat Ullah Ibne Hossain, PhD

Department of Industrial & Systems Engineering
Mississippi State University
Miss State, MS 39762

Phone: (662) 497 1129
Email: ni78@msstate.edu

Career Objectives

Actively seeking for a faculty position in a reputed university that would allow me to utilize my research and teaching skills, knowledge and potentialities, while making a significant contribution to the success of the university and community.

Research Interests

- *Methodologies:*
  i. Systems Engineering; Model-Based Systems Engineering; Systems Simulation; Systems Thinking
  ii. Resilience Analytics; System Risks, Sustainability, and Reliability Assessment.
  iii. Data Analytics, Multi-scale Probabilistic Approach, Bayesian Approach.
- *Application Areas:*
  i. Complex Systems Exploration, System Architecture, Engineering Management.
  ii. Critical Infrastructures (Transportation network, Health Care, Waterway Port, Security Services,Smart Energy Systems, Oil and Gas Industry).
  iii. Logistic & Supply Chain, Cyber-physical Systems, Pandemic Severity.

Teaching Interests

- Systems Analysis and Design
- Systems Simulation
- Model Based Systems Engineering
- Requirement Engineering
- Systems Resilience and Risk Analysis
- Systems Thinking
- Logistic and Supply Chain Management
- Engineering Economy and Statistical Analysis

Education

PhD in **Industrial & Systems Engineering** Spring, 2016 - Fall, 2020
Bagley College of Engineering
Mississippi State University, Starkville, MS, USA
Expected Graduation: Fall' 2020

- Cognate Area: Systems Engineering and Systems Resilience & Risk Analytic
- Advisor: Dr. Raed M. Jaradat
- Dissertation Title: "Development of a New Instrument to Assess the Performance of Systems Engineers based on their System Skills".
- Dissertation Committee Members: Dr. Michael A Hamilton, Dr. Junfeng Ma, Dr. Charles B. Keating.
- GPA: 3.90/4.0

MBA in **Management Information System** December, 2013
University of Dhaka
Dhaka, Bangladesh

Bachelor of Science in **Mechanical Engineering** April, 2010
Khulna University of Engineering and Technology (KUET)
Khulna, Bangladesh

Honors and Awards

- Outstanding (Best) PhD Student Award 2020, Industrial Engineering & Systems Engineering, Bagley College of Engineering, Mississippi State University.
- Winner 2nd place - Institute of Industrial and Systems Engineers (IISE) Innovation Design '2020.
- "Preparing the Future Professoriate Program (PFPP)"–Dean office graduate teaching assistantship award for Fall'2020, Mississippi State University.
- Recipient of Gulf Region Intelligent Transportation Society (GRITS) Scholarship,USA for 2019-2020.
- Best Paper Award in Master and PhD Dissertation Category at 4th North American Industrial Engineering and Operation Management Conference (IEOM), Toronto,Canada, 2019.
- J.R. "Ron" Walsh Best Research Paper Award Winner 2019, Industrial Engineering & Systems Engineering, Bagley College of Engineering, Mississippi State University.
- Best Poster Award at Graduate Student Council Annual Research Symposium 2019, Mississippi State University, MS.
- National Science Foundation (NSF) Grant for 4th North American Industrial Engineering and Operation Management Conference (IEOM), USA, 2019.
- Finalist for Best PhD Student Award 2019, Industrial Engineering & Systems Engineering, Bagley College of Engineering, Mississippi State University.
- Nominated for Spirit of State Award 2019, Mississippi State University.
- Alpha Pi Mu Honors Society, Industrial Engineering & Systems Engineering, Mississippi State University.
- Gamma Beta Phi Honors Society, Industrial Engineering & Systems Engineering, Mississippi State University.
- Honorable Mention at 3rd Annual Summer Science Symposium, Mississippi Academy of Sciences, 2019.
- Bagley College of Engineering Travel Grants, Mississippi State University, 2017, 2018, 2019 & 2020.
- Graduate Student Travel Assistance Grants (TAGGS), Mississippi State University, 2018 & 2019.
- Government Funded University Fellowship at Khulna University of Engineering & Technology , Bangladesh, 2006-2010.

Employment

Academic

- **Temple University**, PA — January, 2021 - Present
  Adjunct Assistant Professor
  Industrial & Systems Engineering Department

- **Raspet Flight Research Laboratory, Mississippi State Univ,** MS — January, 2021 - Present
  Post Doctoral Associate
  Industrial & Systems Engineering Department

- **Mississippi State University** — January, 2016 - Present
  Graduate Research Assistant
  Industrial & Systems Engineering Department

  Funded Research(Project)

  (i) Validation of Low-Altitude Detect and Avoid Standards — January, 2021 - Present
  Federal Aviation Administration (FAA)
  Role: Post Doctoral Associate

  (ii) Leveraging Systems Thinking to Enhance the Holistic Formation of Engineers — July, 2018 - Present
  National Science Foundation (NSF)
  Amount: $199,961
  Role: Graduate Student Researcher and Team Member
  Synopsis:
  1. Evaluate current engineering students' systems thinking capability, using a newly developed instrument, and connect systems thinking capability to the established theoretical frameworks (inductive and deductive reasoning)
  2. Identify and explore various cognitive, demographic, academic, and intuitional factors that influence systems thinking capability; and
  3. Evaluate employers' needs to investigate gaps between students' systems thinking capacity and employers' needs.

(iii) Systems Thinking Capacity Method: Coping with Increasing Complexity September, 2018 - Present
U.S. Department of Defense
Amount: $289,749
Role: Graduate Student Researcher and Team Member
Synopsis:
With the rapid growth and integration in technology and information, the behavior and structure of complex systems presents escalating challenges. Complex systems are marked by a high level of ambiguity, uncertainty, and emergence. These conditions impose challenges and difficulties for practitioners responsible to successfully manage and design complex systems. There is a fundamental need to have a cadre of individuals who are capable of dealing with increasingly complex systems and their problems. One response is Systems Thinking Skills which can provide a holistic thinking paradigm that open new channels and opportunities to think differently about complex systems as a whole unit.The emphasis of this research is to explore the development of a research-based instrument to capture the level of systems skills for individuals who engage and design complex systems.

(iv) Line Balancing of Material Flow of a Manufacturing Company June, 2018 - December, 2018
Viking Range, Greenwood, MS.
Amount: $10,000
Role: Student Team Leader
Synopsis:
The goal was to understand the overall material flows in the assembly line network and rebalancing of assembly line accounted for production and inventory control, cost allocation, and employee evaluation. We designed an effective assembly line balancing that manages the workload of the individual operator and increases the productivity as well. The new documentation also helped to assign a proper number of operators for each steps of the assembly line in order to meet the required production rate with minimum or zero ideal time.

(v) Simulation and Analysis of Air Cargo Material Flow August, 2016 - September, 2017
Fedex Corporation, Memphis, TN.
Amount: $128,000
Role: Team Member
Synopsis:
This research project applies discrete event simulation techniques to study the processes and movement of the vehicle and planes at the FedEx hub, analyzing the performance of the hub and investigating alternative process and policies for its operation. Two main concept models were developed to begin this process, including the intersection traffic model, focusing on the various intersections throughout the facility and the different types of vehicles that traverse them; and the plane loading model, focusing on the process of loading and unloading the planes and the transfer of containers via cargo tractors to and from the planes.

(vi) Continuous Improvement (Kaizen) of Gas Range Production Line June, 2019
Viking Range, Greenwood, MS.
Amount: $10,000
Role: Student Team Leader
Synopsis:
The goal was to apply Kaizen, a Lean manufacturing tool to reduce the waste (idle time) and to improve the quality and productivity of a gas range production line of a manufacturing company. We identified the issues and opportunities, developed solutions based on the statistical analysis using Minitab and proposed new approach. Our proposed approach significantly increase the productivity and reduces the waste of production line. We further developed the Kaizen 5s framework (sort,set, shine, standardize, sustain) inorder to establish a ideal production line.

Teaching & Laboratory Experience January, 2017 - Present
Courses:
– ISE 4104 Production Planning and Control, *Temple University, PA.* Spring, 2021
Role: Instructor
Class Size: 25 (Synchronize Online)

- IE 3123 Industrial Ergonomics Lab, *Miss State Univ.* Fall, 2020
  Role: Instructor
  Class Size: 25 (Synchronize Online)

- IE 4763/6763 Industrial Quality Control, *Miss State Univ.* Summer, 2020
  Role: Instructor
  Class Size: 17 (Synchronize Online), **Evaluation**: 4.0/5.0

- IE 4773/6773 Systems Simulation, *Miss State Univ.* Spring, 2020
  Role: Instructor
  Class Size: 32 (in-class), 13(online), **Evaluation**: 4.0/5.0

- IE 4543/6543 Logistics Engineering Spring, 2019
  Role: Instructor of Record
  Class Size: 47 (in-class), 20(online), **Evaluation**: 4.2/5.0

- IE 4543/6543 Logistics Engineering Spring, 2017 ; Spring, 2018
  Role: Graduate Teaching Assistant
  Class Size: 37 (Spring, 2017), 35 (Spring, 2018)

- IE 4773/6773 Systems Simulation Fall, 2017; 2018; 2019
  Role: Graduate Teaching Assistant
  Class Size: 40 (Fall, 2017), 38 (Fall, 2018)

- **Graduate Teaching Assistant (GTA), Level-3 Certification Program**
  Mississippi State University, MS, Starkville

- Mentoring Undergraduate and Masters Researchers (*11 Undergrads* and *5 Masters* Students till Spring 2020)

Industry

- **BanglaCAT/ Caterpillar, Bangladesh**, February, 2012 - July, 2015
  Senior Engineer, Product Support Division
  Responsibilities: (i) Used Caterpillar Feature based configuration (Fbc) software to generate numeric models for heavy machinery as per customer requirements. (ii) Responsible for developing and coordinating preventative maintenance, overhauling, and trouble shooting program for Caterpillar heavy machinery. (iv) Work with R & D section along with the operations manager to scope out a required technical solution.

- **Energypac Power Generation Ltd.**, November, 2010 - January, 2012
  Engineer, Power Generation Division
  Responsibilities: (i) Used "ECAP" software to provide an optimum solution for generator spare parts. This allows for efficient if-else analyses of different alternatives, provide most favorable solution for the customer. (ii) Responsible for performing overhauling, maintenance and trouble shooting of UK based generators.

Publications

Referred Journal Publications

J16. Nagahi, M.; **Hossain, N.U.I.**; Dayarathna, V.L.; Jaradat, R. (2020). Classification of individual managers' systems thinking skills based on different organizational ownership structures. *Systems Research and Behavioral Science.*

J15. Kerr, C., Jaradat, R., & **Hossain N.U.I.** (2020). Battlefield mapping by an unmanned aerial vehicle swarm: Applied model based systems engineering processes and architectural considerations. *IEEE access.*

J14. **Hossain N.U.I**, Nagahi, M., Dayarathna, V., & Jaradat, R (2020). Systems Thinking: A review and bibliometric analysis.*Systems Journal.*

J13. Nagahi, M.; **Hossain, N.U.I.**; Dayarathna, V.L.; Karam, S.; Babski-Reeves, K.; Jaradat, R. (2020). The impact of participants' anthropometry on muscle activation levels while interacting with the level of expertise, task Type, and single muscles. *Journal of Functional Morphology and Kinesiology.*

J12. Lawrance, J.M., **Hossain N.U.I**, Jaradat, R. & Hamilton, M (2020). A Bayesian network analysis of the vulnerability of supplier to disruptions following severe weather risk: A case study of the U.S. pharmaceutical supply chain following Hurricane Maria. *International Journal of Disaster Risk Reduction.*

J11. **Hossain, N.U.I**, Nagahi. M., Jaradat, R., & Sturgis, E (2020). The effect of an individual's education level on their systems skills in the system of systems domain. *Journal of Management Analytic.*

J10. **Hossain N.U.I.**, Nagahi. M., Jaradat, R., Shah, C., Hamilton, M., & Buchanan, R. (2020). Modeling and assessing cyber resilience of smart grid using Bayesian network based approach: A System of Systems (SoS) problem. *Journal of Computational Design and Engineering.*

J9. **Hossain, N.U.I.**, Jaradat, R., Hamilton, M , Keating, C., & Goerger, R. (2020). A historical perspective of Systems Engineering: A review and analysis. *Journal of Systems Science and Systems Engineering.*

J9. **Hossain N.U.I.**, El Amrani, S., Jaradat, R., Marufuzzaman. M., & Buchanan,R (2020). Modelling and assessing interdependencies between critical infrastructures using Bayesian network: A case study of inland waterway port and surrounding supply chain network. *Reliability Engineering and System Safety.*

J7. **Hossain, N.U.I.**, Nur, F., Jaradat, R., Hosseini, M., Marufuzzaman, M., & Puryear, S. (2019). M. A Bayesian network based approach for modelling and assessing resilience: a case study of a full service deep water port. *Reliability engineering and System Safety*, 189, 378-396.

J6. **Hossain, N.U.I.**, Nur, F., Jaradat, R., Hosseini. M., Marufuzzaman. M., Puryear, S.M., & Buchanan R.K. (2019). Metrics for assessing overall performance of inland waterway port: a Bayesian network based approach. *Complexity.*

J5. Alfaqiri, A., **Hossain, N.U.I**, Jaradat, R., Abutabenjeh, S., Keating, C., Khasawneh, M., & Pinto, A. (2019). A systemic approach for disruption risk assessment in oil and gas supply chains. *International Journal of Critical Infrastructures*, 15(3).

J4. **Hossain, N.U.I.**, Jaradat, R., Hosseini, S., & Marufuzzaman, M. (2019). A framework for modeling and assessing system resilience using a Bayesian network: a case study of an interdependent electrical infrastructure system. *International Journal of Critical Infrastructure Protection*, 25, 62-83.

- **Received J.R. "Ron" Walsh Outstanding ISE Student Research Paper Award.**

J3. Jaradat, R., Stirgus, E., Goerger, R. Ma, J., **Hossain, N.U.I.**, Buchanan, R., & Burch, R. (2019). The assessment of workforce systems skills based on employment domain. *Engineering Management Journal.*, 1-13.

J2. Quddus, M. A., **Hossain, N.U.I.**, Mohammad, 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.

J1. **Hossain, N.U.I.**, Nur, F., & Habib, M. A. (2014). Achieving competitive advantage through practicing TQM tools in Pharmaceuticals Company. *Journal of Mechanical Engineering*, 43(2), 103-109.

Manuscripts Under Review

2. El-Amrani, S., **Hossain, N.U.I**, Jaradat, R, & Hamilton, M. Assessing sustainability of a supply chain network using data fusion technique. *Journal of Cleaner Production. (Under review 2nd round review)*
1. **Hossain N.U.I.**, Zameila, C., & Jaradat, R. Enablers of Resilience in the healthcare supply chain: An illustration of U.S healthcare industry during COVID-19 Pandemic *(Under review 1st round review).*

Manuscripts in Preparation

2. Sakib, N., **Hossain N.U.I.**, Nur, F., & Jaradat, R. Assessment for probabilistic disaster of oil and gas supply chain leveraging multi-echelon Bayesian belief network.
1. Rahman, S., **Hossain N.U.I.**, Nur, F., Kannan, G., & Jaradat, R. Assessing cyber resilience of additive manufacturing supply chain leveraging data fusion technique: A model to generate cyber resilience index of a supply chain.

Conference Proceedings

C20. Elakramine, F., **Hossain, N.U.I**, Jaradat, R.M., Banghart, M., & Kerr, C. (2020). The application of system modelling language (SysML) in an aviation structure and maintenance system. *Proceedings of the 2020 American Society for Engineering Management Annual Conference (ASEM)*, Colorado, CO.

C19. **Hossain, N.U.I**, Nagahi, M., Jaradat, R.M., & Dadi, K. (2020). Development of new systems engineering instrument using text mining technique. *Proceedings of 14th Annual IEEE International Systems conference*, Montreal, Canada, April 20-23.

C18. Nagahi, M., Jaradat, R.M., **Hossain, N.U.I**, Nagahisarchoghaei, M., & Elakramine, F. (2020). Indicators of engineering students' academic performance: A gender-based study'. *Proceedings of 14th Annual IEEE International Systems conference*, Montreal, Canada, April 20-23.

C17. **Hossain, N.U.I**, Jaradat, R.M., Kerr, C., & Dadi, K. (2020). How to develop effective system engineers? *Proceedings of the 2020 American Society for Engineering Management Annual Conference (ASEM)*, Colorado, CO.

C16. **Hossain, N.U.I**, El-Amrani, S., Nagahi, M., & Jaradat, R.M.(2020). Modeling and assessing social sustainability of a healthcare supply chain network leveraging multi-echelon Bayesian Network. *Proceedings of 14th Annual IEEE International Systems conference*, Montreal, Canada, April 20-23.

C15. Muthumanickam, A., Kumar, L., **Hossain, N.U.I**, Lawrence, J.M., & Jaradat, R.(2020). Determining the consistency rate for overall equipment effectiveness using the coefficient of variance method. *Proceedings of the 2020 American Society for Engineering Management Annual Conference (ASEM)*, Colorado, CO.

C14. Nagahi, M., Nagahisarchoghaei, M., **Hossain, N.U.I,**, & Jaradat, R.M. (2020). The relationship between Engineering Students' Systems Thinking Skills and Proactive Personality: Research Initiation .*Proceedings of the 2017 Industrial and Systems Engineering Conference (IISE)*, LA, May 30^{th}-June 2^{nd}, 19-21.

C13. Lawrence, J.M., **Hossain, N.U.I,** Rinaudo, C., Buchanan, R., & Jaradat, R.M. (2020). An Approach to Improve Hurricane Disaster Logistics Using System Dynamics and Information Systems .*18th Annual Conference on Systems Engineering Research (CSER)*, CA, March 19-21.

C12. **Hossain, N.U.I**, Nagahi, M., Jaradat, R.M., & Keating, C. (2019). Development of an new instrument to assess the performance of systems engineers. *Fourth North American International Conference on Industrial Engineering and Operation Management* , Toronto, Canada, October 23-25.

- **Received Best Paper Award: Master and PhD Dissertation Category.**

C11. Nagahi, M., **Hossain, N.U.I**, Jaradat, R.M., Georger, S., & Abutabenjeh, S. (2020). Do the practitioners' level of systems-thinking skills differ across sector types? *Proceedings of 14th Annual IEEE International Systems conference*, Montreal, Canada, April 20-23.

C10. Kerr, C., **Hossain, N.U.I**, & Jaradat, R.M. (2020). Method for Non-Linear Scaling of Multi-Criteria Decision Making Attribute Values. *Proceedings of 14th Annual IEEE International Systems conference*, Montreal, Canada, April 20-23.

C9. Lawrence, J.M., **Hossain, N.U.I**, Nahagi, M., & Jaradat, R.M. (2019). Impact of cloud-based applied supply chain network simulation tool on developing systems thinking skills of undergraduate students. *Fourth North American International Conference on Industrial Engineering and Operation Management* , Toronto, Canada,October 23-25.

C8. Nagahi, M., **Hossain, N.U.I**, & Jaradat, R.M.(2019). Gender differences in practitioners preferences for systems thinking skills. *Proceedings of the 2019 American Society for Engineering Management Annual Conference (ASEM)*, Philadelphia, PA.

C7. Nagahi, M., **Hossain, N.U.I**, Jaradat, R. M., & Grogan, S. (2019). Moderation effect of managerial experience on the level of systems thinking skills. *Proceedings of 13th Annual IEEE International Systems conference*, Orlando, FL, April 8-11.

C6. **Hossain N.U.I.**, Jaradat, R. M., Marufuzzaman, M., Buchanan, R.K., & Rinaudo C. (2019). Assessing oil and gas supply chain resilience: Bayesian Network approach. *Proceedings of the 2019 Industrial and Systems Engineering Conference*, Orlando, FL, May 19-23.

C5. **Hossain N.U.I.**, & Jaradat, R. (2018). Leveraging six sigma approach to reduce patient waiting time. *Proceedings of the 2018 International Annual Conference of American Society for Engineering Management (ASEM)*, Coeur d'Alene, ID, October, 17-20.

C4. **Hossain N.U.I.**, & Jaradat, R. (2018). A synthesis of definitions for systems engineering. *Proceedings of the 2018 International Annual Conference of American Society for Engineering Management (ASEM)*, Coeur d'Alene, ID, October, 17-20.

C3. **Hossain, N.U.I.**, Debusk, H., Hasan, M., Jaradat, R. M., & Khasawneh, M. (2017). Reducing patient waiting time in an outpatient clinic: A Discrete Event Simulation (DES) based approach. *Proceedings of the 2017 Industrial and Systems Engineering Conference*, Pittsburg, PA,May 19-23.

C2. **Hossain, N.U.I.**, Nur, F., & Jaradat, R. M. (2016). An analytical study of hazards and risks in the shipbuilding industry. *Proceedings of the 2016 American Society for Engineering Management Annual Conference*, Charlotte, NC. October, 18-21.

C1. **Hossain, N.U.I.**, Islam, K.S., & Rahman, M. Design, construction & performance test Of Solid Desiccant Cooling System(2010). *Proceedings of the 2010 International Conference on Mechanical, Industrial and. Energy Engineering* , Khulna, Bangladesh.

Conference/Symposium Presentations

P16. **Hossain, N.U.I.**, Jaradat, R.M., & Nagahi, M., (2019). A performance measure approach for systems engineers. *17th Annual Graduate Research Symposium*, Mississippi State University. Miss State, MS.

P15. Nagahi, M., Jaradat, R.M.,& **Hossain, N.U.I.** (2019). Personality Types and Systems Thinking Skills of Practitioners. *Graduate Student Council Annual Research Symposium*, Mississippi State University, MS.

- **Received Best Poster Award in Doctoral Student Category.**

P14. El Amrani, S., **Hossain, N.U.I.**, Jaradat, R.M., & Marufuzzaman, M. (2019). Modelling and assessing critical infrastructure interdependencies using multi echelon Bayesian network: A case study of Mississippi port and nearby supply chain network. *17th Annual Graduate Research Symposium*, Mississippi State University. Miss State, MS.

P13. **Hossain, N.U.I.**, Jaradat, R.M., & Nagahi, M., (2019). How to find effective systems engineers? *Fourth North American International Conference on Industrial Engineering and Operation Management*, Mississippi State University. Miss State, MS.

P12. Nagahi, M., Jaradat, R.M., & **Hossain, N.U.I.** (2019). How Personality Types Impacts Systems Thinking Skills of Individuals. *INFORMS Annual Meeting*, Seattle, WA.

P11. Nagahi, M., **Hossain, N.U.I.**, Jaradat, R.M., & El Amrani, S. (2019). Does job experience affect managers' level of Systems-Thinking (ST) skills? *Mississippi Academy of Science Symposium*, Mississippi State University. Miss State, MS.

P10. Dayarathna, V.L., Karam, S., El Amrani S., Jaradat, R., Hamilton, M., Jones, P., Wall, E., Hsu, G., & **Hossain, N.U.I.** (2019). Measuring individuals' systems thinking skills through the development of an immersive virtual reality complex system scenarios. *Mississippi Academy of Science Symposium*, Mississippi State University. Miss State, MS.

P9. **Hossain, N.U.I.**, Mimesh, H., Nur, F., Jaradat, R. M., & Marufuzzaman, M. (2019). Assessing cyber vulnerabilities of power systems using Bayesian network approach. *2019 Industrial and Systems Engineering Conference*, Orlando, FL,May 19-23.

P8. Mimesh, H., **Hossain, N.U.I.**, Nur, F., Marufuzzaman, M., & Puryear, S. (2019). A Discrete event simulation based approach for managing cyber vulnerabilities. *2019 Industrial and Systems Engineering Conference*, Orlando, FL,May 19-23.

P7. **Hossain, N.U.I.**, El Amrani, S., Jaradat, R.M., Marufuzzaman, M., & Nagahi, M. (2019). Modelling and assessing interdependencies between critical infrastructures: A case study of Mississippi port and surrounding supply chain network. *Mississippi Academy of Science Symposium*, Mississippi State University. Miss State, MS.

P6. **Hossain, N.U.I.**, Hasan, M., & Jaradat, R.M (2019). Metrics for selection of additive manufacturing supplier using multiscale probabilistic approach. *Graduate Student Council Annual Research Symposium*, University of Mississippi. Miss State, MS.

P5. **Hossain, N.U.I.**, Nagahi, M., & Jaradat, R.M (2018). The effects of an individual's education level in their systems thinking skill in system of system domain. *Mississippi Academy of Science Symposium*, Mississippi State University. Miss State, MS.

P4. **Hossain, N.U.I.**, Marufuzzaman, M., & Jaradat, R.M (2018). Modelling and assessing resilience of an electrical Infrastructure system using Bayesian approach. *Mississippi Academy of Science Symposium*, Mississippi State University. Miss State, MS.

P3. Nagahi, M. Jaradat, R.M., & **Hossain, N.U.I.** (2018). Classification of an individual's systems thinking skills/preference based on organizational ownership structure. *Mississippi Academy of Science Symposium*, Mississippi State University. Miss State, MS.

P2. **Hossain, N.U.I.**, & Jaradat, R.M (2017). The development of a holistic multi-state reliability methodology for a system of systems (SoS). *Graduate Research Symposium*, Mississippi State University. Miss State, MS.

P1. Quddus, M.A., **Hossain, N.U.I.**, Marufuzzaman, M., & Jaradat, R. M. (2016). Sustainable network design for multi-purpose pallet processing depots under biomass supply uncertainty. *INFORMS Annual Meeting*, Nashville, TN.

Training Experience

- **Model Based Systems Engineering (SysML)** May, 2019
  Trainer: Sanford Friedenthal
  NO Magic Corporation
  Allen, TX
- **Simulation and Modeling Analysis Using FlexSim** July, 2018 - August, 2018
  Center for Advanced Vehicular System Extension(CAVSE)
  Mississippi State University, USA
- **Six Sigma Green Belt** August, 2019
  Institute of Industrial and Systems Engineers (IISE), USA
- **Six Sigma Yellow Belt** September, 2016
  Institute of Industrial and Systems Engineers (IISE), USA
- **Graduate Teaching Assistant (GTA) Certification Program** August, 2016
  Mississippi State University, USA.
  Certified for GTA level-3

Professional Services

Reviewer

- Complexity Journal (Wiley)
- IEEE Engineering Management Journal (IEEE)
- Environment Systems and Decisions (Springer)
- International Journal of System of Systems Engineering (Inderscience)

INFORMS Student Chapter at Mississippi State University, USA

- **Role**:Vice President of Corporate Relation January, 2020 - Present
  Responsibilities
  1. Finding and inviting corporate and managing communications.
  2. Arranging industrial tours.
  3. Attracting sponsors and organize fund raising events.
  4. Communicating with other chapters to learn their practices and look for any collaborative activities.
  5. Managing facilities to run the event.

International Student Advisory Board (ISAB) at MSU, USA

- **Role**: Secretary (Executive Board Member) April, 2018 - April, 2019
  Responsibilities
  1. Help the president to run the international leaders meeting.
  2. Keep a record of all members of the organization.
  3. Keep a record of all activities of the organization.
  4. Keep and distributes the minutes of each executive board meeting.
  5. Other duties as required.

INFORMS Student Chapter at Mississippi State University, USA

- **Role**:Vice President of Social Affairs January, 2017 - December 2017
  Responsibilities
  1.Manages all social activities and marketing procedures of the organization.
  2.Communicates with Public Relations Officer to publicize and market all events held by the organization.

3. Creates all flyers, promotional items,logos, t-shirt designs and other publicity items as needed.

Membership in Professional Organizations:

- Institute of Industrial and Systems Engineers (IISE)
- International Counsel of Systems Engineering (INCOSE)
- Institute of Operation Research and Management Science (INFORMS)
- American Society of Engineering Management (ASEM)

Volunteer Services

Bangladesh Student Association at MSU, Starkville, Mississippi, USA June, 2016 - May, 2017
- Vice President

Habitat for Humanity, Starkville, Mississippi, USA April, 2017- May, 2019
- Member

United Way, North Central Mississippi, USA May, 2019- May, 2020
- Member

Maroon Volunteer Service at MSU, Starkville, Mississippi, USA July, 2017- December, 2019
- Member

Computer Skills

- Simulation Language: Flexsim (intermediate), Vensim (intermediate), AgenaRisk (advance).
- Modeling Language: Cameo Systems Modeler (A system engineering modeling language -SysML)(intermediate).
- Data Analytics: AMOS (advance), Nvivo (advance), Qiqqa (intermediate).
- Programming Language: C (intermediate),Visual Basic (intermediate), R (intermediate),Python (intermediate).
- Utility Software: AutoCAD (Basic), LaTex (advance), Lawson.
- Application Packages: Microsoft Office (advance), Microsoft Visio (advance).

References

Raed M. Jaradat, PhD
Associate Professor
Department of Industrial & Systems Engineering
Mississippi State University, Starkville, MS 39762
Email: jaradat@ise.msstate.edu ; Phone: (662) 325-7623

Kari Babski-Reeves, PhD
Professor and Head, Department of Industrial and Systems Engineering
Larry G Brown Endowed Professor
Associate Dean, Bagley College of Engineering
Mississippi State University
Email: kari@bagley.msstate.edu; Phone: (662) 325-7624

Michael Hamilton, PhD
Assistant Professor, North Carolina AT&T University
Department of Industrial & Systems Engineering
Greensboro, NC 27411
Email: mahamilton1@ncat.edu
Phone: (540) 413-6153

Charles Keating, PhD
Professor and Director for the National Centers for System of Systems Engineering (NCSOSE)
Engineering Management and Systems Engineering
Old Dominion University, Norfolk, VA 23529
Email: ckeating@odu.edu ; Phone: (757) 683-5753

MISSISSIPPI STATE UNIVERSITY
JAMES WORTH BAGLEY COLLEGE OF ENGINEERING

DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Dr. Raed Jaradat
Associate Professor
jaradat@ise.msstate.edu

Dear Search Committee,

I am writing this letter in support of **Niamat Ullah Ibne Hossain** as a potential candidate for Black Trailblazer in Engineering Scholarship, Purdue University. I have known Niamat more than four and half years as my direct supervised PhD student. During these years, we have worked together and collaborated in professional activities that are detailed next.

I've had the pleasure of advising Mr. Hossain as his major advisor. We've collaborated on numerous journal and conference papers as well as technical reports and he's been a student in my classes. Based on my experience, Mr. Hossain has always been a well-respected hard worker who can work independently with minimal to no direction required. He demonstrates all the right mix of ingredients as a great student researcher. Recently, he has been awarded "Outstanding PhD student" from the Industrial and Systems Engineering Department, MSU.

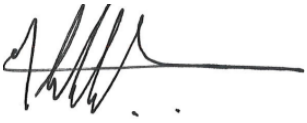
In the area of scholarship, Mr. Hossain has performed exceptionally well in a difficult curriculum. In addition, he has worked diligently in preparation to enter the higher education profession. He has worked hard and developed a skill set to engage in scholarly publications and presentation of his work to peer groups at conferences and seminars. His two of the research papers have been awarded as "outstanding student paper" in international conferences and beside this, he is also recipient of some prestigious awards at national, intra-university, and departmental level. Due to his contribution in transportation research, recently he received Gulf Region Intelligent Transportation Society (GRITS) for 2019-2020, is one of only 5 students selected for this scholarship nationwide. He has been able to communicate his work and difficult concepts to a wide variety of audiences in multiple venues. He has also done a good job as instructor of records, assisted in teaching classes as a certified Graduate Teaching Assistant, giving guest lectures and leading scholarly discussions. Mr. Hossain has also worked significantly on my current funded projects with NSF and the Department of Defense. Beside that, he actively guided undergraduate and master's students for their research projects.

Mixing his academic and project experience with his research efforts have generated an environment that positioned Niamat in the cutting-edge of the body of knowledge with respect to engineering of complex systems. These knowledge, skills, and abilities are what make him unique and a great fit with academic or industry. Due to his innovative design skills, he has also been awarded 2nd place in "Design and Innovation" track at Institute of Industrial and Systems Engineering conference (2020). His extensive project experience and socio-cognitive skills have made him an important part in my scholarly activities. He is a joyful, very smart, driven leader that never let down his peers and supervisors. I am confident that he will continue to demonstrate the qualities of an exceptional scholar.

Undoubtedly, Mr. Hossain will be successful in upcoming days. He has the determination and aptitude that will ensure success. He has the ability to balance intellectual ability, scholarly curiosity, self-discipline, an intense desire to learn, and a passion to share his knowledge. These qualities have made my relationship with Mr. Hossain extremely rewarding. He is a high caliber individual who will make substantial career contributions in higher education. I strongly recommend him for Black Trailblazer in Engineering Scholarship, Purdue University.

Should you have any questions regarding my comments about Mr. Hossain, please feel free to contact me directly (phone 757-839-3166, e-mail jaradat@ise.msstate.edu).

Sincerely,



Raed Jaradat, PhD
Associate Professor

Jeanne-Marie Lawrence
Tel: (252) 916-1567 (M) (252) 328-9662 (W) Email: jel487@msstate.edu

January 16, 2021

TO WHOM IT MAY CONCERN

I would like to take this opportunity to provide a letter of recommendation for Niamat U. I. Hossain, who is applying for a post-doctoral associate position at your institution. I have known Niamat for four semesters as a graduate student colleague in the Department of Industrial and Systems Engineering at Mississippi State University.

As a distance-education PhD student, I had the opportunity to witness Niamat's teaching skills firsthand while taking a graduate course in Logistics Engineering. As a graduate assistant, Niamat was responsible for teaching the theoretical and quantitative aspects of the course, which included supply chain network design, aggregate planning and forecasting, and the application of linear programming software to solve supply chain optimization problems. For this course, as for all distance education courses offered by the department, face-to-face lectures were recorded and provided to distance education students to ensure consistency in quality and content delivery. It was very obvious that Niamat had prepared extensively for both instruction and practice problems. His explanations were clear and delivered in a logical sequential manner which facilitated rapid understanding of the material. He was also careful to supplement the textbook content, where necessary, to remind students of the relevant underlying theory that supported the problem solutions. In the classroom, he was efficient, personable, and enthusiastic in answering students' questions. He also went over and beyond to offer his assistance to students to guide them through the literature review for the final paper.

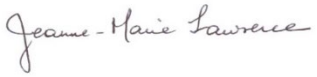
I also had the pleasure of collaborating with Niamat on four papers for publication, which required multiple virtual meetings and email communications. I found Niamat to be an excellent team player, who constantly sought ways to enhance and complement the strengths of others. He was quick to respond to communications, generous in sharing his knowledge and skills, and very patient in guiding me through the publication process. He continued to work with me, through multiple iterations until we were satisfied with the final product. He was also extremely helpful in providing examples of his work and other scholarly papers and in recommending potential journals for publication.

Throughout my communication with Niamat, I can honestly say that I found him to be a kind and fair person who is genuinely interested in helping others succeed. My conversations with him were always encouraging and motivating. I also noticed that he was extremely respectful and grateful to his mentors and professors in all his referrals and discussions. I have no doubt that he is intellectually capable and socially adept at building strong relationships with both students and the faculty.

I believe that Niamat's teaching, research, and mentoring skills will make him an excellent professor. Based on my interactions and observations, I recommend Niamat without hesitation for the position of assistant professor at your institution.

If you require any further information, please do not hesitate to contact me.

Respectfully,



Jeanne-Marie Lawrence

To whom it may concern:

I am pleased to write a letter of recommendation for Niamat Hossain, an exceptional man who is academically competent and possesses intangible attributes that make him a joy to have on one's team. I met Niamat a couple of years ago as a graduate research assistant for Dr. Jaradat in the Industrial & Systems engineering program. Niamat is a very inquisitive individual and always seeking to acquire as much knowledge as possible for the research and work task given to him. He is one of the best graduate researchers on the team and has a good mind in thinking through and solving problems.

Niamat is instrumental in the success of our current research efforts which focuses on developing system skills tools to understand and enhance the ability of system thinkers in optimizing industrial processes. I and everyone who worked with him find him to be enthusiastic, energetic, and well-organized. He always comes to the research labs prepared to work and able to carry out tasks independently and professionally.

I have enjoyed getting to know Niamat as a person over the past few years. I found him to be wise beyond his years, and have always admired his ambition and drive to succeed. I am pleased that he is applying to be part of the Black Trailblazers in Engineering program. I do not doubt that Niamat is equipped with the skills, focus, and determination to thrive, and I know that he will make positive contributions to the Black Trailblazers in Engineering program.

Niamat is a rare find. He is well-trained, goal-oriented, and open-minded. I believe he will be successful in any endeavors he pursues because of his burning commitment to learning and his dedicated work ethic.

I recommend him very highly and without reservation.

Michael A. Hamilton, Ph.D

Assistant Professor
Department of Industrial and Systems Engineering
North Carolina A&T State University
1601 E. Market Street

402 McNair Hall Room 405
Greensboro, NC 27411

Office# (336) 334-7780

Direct Line # (336) 285-3730

Cell # (540) 413-6153