Syed A. M. Shihab

Assistant Professor
Director of Green and Advanced Mobility Engineering Lab
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Research Interests

As the Director of the Green and Advanced Mobility Engineering (GAME) lab, my research focuses on tackling pressing operations planning and control problems in Advanced Air Mobility (AAM) and conventional aviation by developing advanced air transportation systems with artificial intelligence / machine learning, optimization, optimal control, and systems engineering. Research applications of interest include aircraft collision avoidance with birds and noncooperative aircraft; low-altitude surveillance for AAM; supply chain management for aviation manufacturers; AAM aircraft dispatching and flight scheduling; airline dynamic pricing and revenue management; and route planning.

Education and Training

Iowa State University (ISU), Ames, IA
Ph.D. in Aerospace Engineering **(CGPA: 4.0/4.0)** Summer 2020
Dissertation title: *DeepARM: An Airline Revenue Management System for Dynamic Pricing and Seat Inventory Control using Deep Reinforcement Learning*
Significance: First in academia to demonstrate AI-based revenue management systems can outperform traditional optimization- and model-based systems

American International University-Bangladesh (AIUB), Dhaka, Bangladesh
B.S in Electrical & Electronic Engineering **(CGPA: 4.0/4.0)** Fall 2011
Thesis title: *Design and Performance Analysis of Centrally Seeded, Long Reach, Cost Optimized Hybrid DWDM-TDMA Passive Optical Network*
Significance: Improved design of passive optical networks to achieve a longer transmission length while maintaining acceptable bit error rates

Kent State University (KSU), Center for Teaching and Learning, Kent, OH
Early Career Teaching Program for Faculty Fall 2022
Completed pedagogy training on student-centered syllabi design, inclusive teaching, backward course design technique, Universal Design for Learning framework, active learning strategies and metacognition

Academic Appointments

KSU, College of Aeronautics and Engineering (CAE), Kent, OH
Assistant Professor Fall 2020 – Present
Director of GAME Lab GAME LAB

ISU, Intelligent Aerospace Systems Lab, Ames, IA
Research Assistant Spring 2017 – Summer 2020

ISU, Department of Aerospace Engineering, Ames, IA
Teaching Assistant Fall 2015 – Spring 2017

AIUB, Department of Electrical & Electronic Engineering, Dhaka, Bangladesh
Lecturer Spring 2012 – Spring 2015

Research Grants and Projects

Principal Investigator, **Laying the Cornerstone of Advanced Air Mobility Infrastructure: A Low-Altitude Airspace Surveillance System Optimized for Reliability, Robustness, Resilience, and Cost**

02/25 – 08/26

KSU budget to date: $150,000 (my allocation: 90%)
Funding Source: Ohio Department of Transportation / Federal Highway Administration (FHWA) / CAL Analytics
(1) Analyzing and assessing the reliability, robustness, and resilience of surveillance systems for detecting and tracking Advanced Air Mobility (AAM) traffic in the low-altitude national airspace system (NAS), (2) developing a sensor network design software tool to design a surveillance sensor network for AAM optimized for reliability, robustness, resilience, and cost, across major cities of the state of Ohio; and, (3) formulating a safety protocol for AAM traffic managers and operators to follow during AAM surveillance outages or when the performance of the AAM surveillance system is impaired due to failure events.

Co-Principal Investigator, **Advanced Air Mobility Elevating Northeast Ohio**

10/24 – 09/26

KSU budget to date: $399,999.52 (my allocation: 25%)
Funding Source: Parallax Advanced Research / Advanced Manufacturing and Applied Research Innovation Institute (AMARII)
Determining technical and regulatory system requirements to obtain Certificates of Waiver or Authorization (COA) from FAA for Parallax's MTEC / MTDL units ("mobile unit" or "system" (UAV control station + UTM system)) for commercial and civilian use cases. Performing tests and demonstrations of the mobile units that are critical to obtaining the FAA COA. Determining system design solutions to enhance the reliability, robustness, and resilience (3Rs) of the mobile units. Determining system design solutions for developing a commercial version of the mobile units to plan, manage, and control BVLOS UAV operations in commercial AAM use cases. Developing training courses and programs centered around UTM to provide training and certification to the next generation UTM workforce.

Principal Investigator, **REU Site: Research Experiences for Undergraduates in Robotics and Autonomous Systems**

05/23 – 04/26

KSU budget to date: $402,740 (my allocation: 40%)
Funding Source: National Science Foundation (NSF)
Administering the REU site at KSU. Supervising and supporting undergraduate research on robotics and autonomous systems. Organizing professional development workshops and research seminars for REU students. Recruiting REU students.

Co-Principal Investigator, **Digital Engineering and Design Center for Space Applications at KSU (DEDC-Space@Kent)**

06/24 – 07/25

KSU budget to date: $553,881 (my allocation: 20%)
Funding Source: National Center for Defense Manufacturing and Machining (NCDMM) / DoD
Training the next generation digital engineering workforce on systems and digital engineering to join the nation's aerospace and defense sectors. Supporting research and development of cost-effective and robust aerospace and defense systems with cutting edge digital engineering tools.

Key Personnel, **Kent State University Super Regionally Aligned Priorities in Delivering Skills (Super RAPIDS)**

12/23 – 06/25

KSU budget to date: $1,146,291.29 (my allocation: 0.35 months of summer effort)
Funding Source: The Ohio Department of Higher Education
Developing training curriculum based around a Command and Control System for uncrewed aircraft to prepare students for careers in the AAM industry

Co-Principal Investigator, **Open Framework Standards for Combined Aircraft Sensor Network for the State of Ohio to Detect and Track Lower Altitude Aircraft**

09/21 – 03/23

KSU budget to date: $128,833.68 (my allocation: 50%)
Funding Source: Ohio Department of Transportation (ODOT)/Federal Highway Administration (FWHA)/CAL Analytics
Our team has conducted research and development of open-source requirements and interface standards for efficiently scaling Ohio's emerging UAS surveillance capability for lower altitude operations. We have also developed an optimization model to design AAM surveillance networks across the State of Ohio with minimum capital cost, taking into account terrain types and detection probabilities. Moreover, we have conducted a rigorous data-driven cost-benefit analysis to identify, quantify, and evaluate benefits and costs of the proposed AAM surveillance network connected to a statewide air traffic monitoring center with a centralized data clearinghouse, based on the desired project objectives, and system architecture, functional requirements, and capabilities.

Faculty Advisor, **Pea Power: The Effects of Microgravity on Pisum Sativum Roots**
Experiment proposal selected for microgravity experiment onboard the International Space Station (ISS)

08/23 – 05/24

Research Support: Student Spaceflight Experiment Program (SSEP) Mission 18 by the National Center for Earth and Space Science Education (NCESSE) and KSU CAE
Investigated the hydroponic growth of a food plant in microgravity for astronauts. Supervised formal proposal writing of undergraduate students. Launch date: Fall 2024. Launch site: Space Launch Complex 39A, NASA Kennedy Space Center, FL. Ferry vehicle: SpaceX spacecraft

Faculty Advisor, **Minimizing the Risk Probability and Impact of UAV-Aerial Wildlife Strikes**

Fall 2024 – Spring 2025

Graduate Fellowship Awarded to My Student: $20,000
Funding Source: Ohio Space Grant Consortium (OSGC)
Developed collision avoidance algorithms to prevent bird strikes with AAM aircraft (UAVs and eVTOLs).

Faculty Advisor, **Tactical Deconfliction for Low Altitude Aircraft Considering Bird Movement**

Fall 2023 – Spring 2024

Undergraduate Student Scholarship Awarded to My Student: $3500
Funding Source: OSGC
Developed a deconfliction algorithm which determines the midair trajectory changes required to prevent bird strikes with aircraft during takeoff.

Faculty Advisor, **Strategic Flight Planning of Low Altitude Aircraft Considering Bird Movement**

Fall 2022 – Spring 2023

Undergraduate Student Scholarship Awarded to My Student: $3500
Funding Source: OSGC
Won 1st Prize in the OSGC Undergraduate Student Poster Competition
Developed a deconfliction algorithm which determines the departure delay required to prevent bird strikes with aircraft during takeoff. The algorithm considers forecasts of bird flight paths from bird movement predictive models and departure trajectory of aircraft. Boeing 737 aircraft taking off from Cleveland Hopkins International Airport was used in the case study.

Faculty Advisor, **Motion Prediction of Birds to Prevent Bird Strikes with Lower Altitude Aircraft**

Summer 2022

Undergraduate Student Scholarship Awarded to My Student: $3200
Funding Source: KSU Summer Undergraduate Research Experience (SURE)
Modeled bird movement and predicted future flight tracks of sparrows and pigeons (high risk bird species in aviation) using linear and nonlinear regression models. The performance of regression models was used to benchmark advanced AI predictive models (Long Short-Term Memory (LSTM) Recurrent Neural Networks).

Previous Research Experience

DeepARM: An Airline Revenue Management System for Dynamic Pricing and Seat Inventory Control using Deep Reinforcement Learning

Fall 2018 – Fall 2021

- Developed an air travel market simulator to model passenger arrivals, bookings and cancellations for multiple fare classes
- Configured and trained a deep neural network to predict the state-action values (expected optimal revenues) using deep Q-learning
- Achieved > 93% of optimal revenue on average using the post-training dynamic pricing and seat inventory control policy; closely matched the optimal policy performance; and outperformed the EMSRb-based revenue management system
- Demonstrated DeepARM's adaptability to changes in market conditions by simulating various market perturbations
- Investigated an AI approach for competition-aware airline revenue management

A Data-Driven Decision-Making Framework for Optimizing the Value-Based Performance of Complex Network Systems

Fall 2017 – Fall 2019

- Developed a design framework for performance-optimized complex network systems, such as air transportation networks, with desired levels of robustness and resilience using operations research, value-based modeling, utility theory, data analytics, demand forecasting and consumer choice theory
- Programmed a web scraper to automate collection of historical airline booking data, on-time performance data, and financial data from Bureau of Transportation Statistics and preprocessed the datasets for running analyses
- Forecasted demand of origin-destination markets using time series analysis
- Implemented and estimated an itinerary share model based on an aggregate multinomial logit model to predict market shares in a competitive environment

By Schedule or On-Demand? - A Hybrid Operational Concept for Urban Air Mobility Services

Fall 2018 – Fall 2019

- Derived a new operational concept for Urban Air Mobility (UAM) services
- Developed scheduling and dispatching models for scheduled, on-demand, and hybrid UAM services
- Extended these models to include the provision of offering power grid services using the collection of batteries in the electric vehicle fleet for generating additional revenues for UAM operators

Cyber-based Decision Support Strategies to Achieve Consensus for Food Energy Water System Sustainability using Incentive and Policy Structures

Summer 2018 – Spring 2020

- Contributed towards building decision support tools for policymakers with the goal of ensuring resilience and sustainability of Iowa's Food-Energy-Water (FEW) network while satisfying FEW constraints and facilitating consensus among diverse stakeholders using Bayesian networks, decision diagrams, data analytics, and inference, parameter and structure learning algorithms

Systems Engineering Failure Case Studies

Spring 2018 – Summer 2018

- Surveyed and gathered insight from systems engineering failure case studies, such as the Joint Strike Fighter F-35 case study, to improve design practices of large scale complex engineered systems

Preference Modeling for Government-Owned Large-Scale Complex Engineered Systems: A Space Telescope Case Study

Fall 2017

- Explored, identified, and modeled preferences and requirements of NASA, Congress and scientists
- Collected and analyzed existing satellite data to quantify attributes and relationships between variables of interest
- Formulated "Science Return" value function based on "Science Impact" metric and spin-off measure for capturing the true preferences of stakeholders and optimizing the design of space telescopes

Design and Performance Analysis of Centrally Seeded, Long Reach, Cost Optimized Hybrid Passive Optical Network

Summer 2011 – Fall 2011

- Designed a fiber-to-the-home Passive Optical Network (PON)
- Extended the maximum possible fiber optic span of PON while keeping cost to a minimum

Teaching Experience

Spring 2012 – Present

Course Development and Major Course Modifications

- AERN 65230: Modeling and Forecasting for Aviation Logistics Planning (KSU)
- ENGR 15500: Introduction to Aerospace Engineering (KSU):
  - Introduced a lighter-than-air (LTA) student competition in which students had to design, build, and fly a LTA craft through an obstacle course. This LTA competition provided experiential learning to students.
- AERN 65091: Seminar in Emerging Issues in Aviation (KSU)
  - Updated every semester to incorporate current pressing challenges in the aviation industry
- ENGR 47200/57200/71095: Systems Engineering (KSU)
  - Developed course content and lecture materials. Integrated concepts such as digital engineering and model-based systems engineering and systems modeling software such as SysML. Integrated my systems engineering research into the course.

Course Instruction

- AERN 65499: Capstone in Aeronautics (KSU)
- AERN 65091: Seminar in Emerging Issues in Aviation (KSU)
- AERN 65230: Modeling and Forecasting for Aviation Logistics Planning (KSU)
- AERN 65100: Logistical Strategies in Aviation Management (KSU)
- ENGR 47200/57200/71095: Systems Engineering (KSU)
- ENGR 15500: Introduction to Aerospace Engineering (KSU)
- EEE 4101: Control Systems (AIUB)
- CE 274: Engineering Statics (ISU; role: TA)
- ME 345: Engineering Dynamics (ISU; role: TA)

- EEE 3213: Electrical Properties of Materials (AIUB)
- EEE 2105: Electrical Machines (AIUB)

Lab Instruction

- EEE 4102: Control Systems Lab (AIUB)
- EEE 2106: Electrical Machines Lab (AIUB)
- EEE 4103: Microprocessor Lab (AIUB)

Research Supervision

PhD Students

- Esrat F. Dulia, Aerospace Engineering, KSU — Fall 2023 – Present
  Research focus: *Surveillance for AAM*
  Notable accomplishments:
  1. Research poster on AAM surveillance presented at Ohio Space Forum, Cleveland, OH, April 2024 **won third place in research poster competition**
  2. Research presentation on AAM surveillance **won first place in KSU's Three Minute Thesis competition**

- Elaheh S. Varnousfaderani, Mechatronics Engineering, KSU — Fall 2022 – Present
  Research focus: *(1) Preventing and Mitigating Bird Strikes with Aircraft; and (2) AAM Aircraft Dispatch Algorithms for AAM Use Cases*
  Notable accomplishment: Research presentation on bird strike prevention **won second place in KSU's Three Minute Thesis competition**

MS Students

- Delonte Goodman, Mechatronics Engineering, KSU — Fall 2024 – Present
  On track to start PhD in Spring 2026
  Research focus: *Reliability, Robustness, and Resilience of AAM Systems*
- Collin Schofield, Mechatronics Engineering, KSU — Fall 2024 – Present
  Awarded NASA Ohio Space Grant Consortium Fellowship
  Research focus: *Preventing and Mitigating Bird Strikes with AAM Aircraft*
- Caleb Adams, Aerospace Engineering, KSU — Summer 2025 – Present
  Awarded NASA Ohio Space Grant Consortium Fellowship
  Research focus: Contingency Management for AAM
- Esrat F. Dulia, Aerospace Engineering, KSU — Fall 2021 – Summer 2023
  Research focus: *Surveillance for AAM*
- Oluwasemilore 'Soore' Akintelure, Dual Aviation Management and Logistics & MBA, KSU — Summer 2022 – Fall 2022
  Research focus: *Supply Chain Planning for AAM Manufacturers*

Undergraduate Students

- Jonathan King , Aeronautical Systems Engineering — Fall 2023 – Present
  Research focus: *(1) Contingency Management for AAM; and (2) Growth of Food Plant in Microgravity Environment for Astronauts*
  Research support: NCESSE and KSU CAE
- Mackenzie Guy, Professional Pilot, KSU — Fall 2023 – Summer 2024
  Research focus: *Growth of Food Plant in Microgravity Environment for Astronauts*
  Research support: NCESSE and KSU CAE

- Collin Schofield, Mechatronics Engineering, KSU — Summer 2023 – Summer 2024
  Awarded NASA OSGC Scholarship
  Research focus: *Strategic and Tactical Deconfliction Algorithms to Prevent Bird Strikes with Low Altitude Aircraft*
- Caleb Adams, Aerospace Engineering, KSU — Fall 2024 – Spring 2025
  Research focus: *AAM Surveillance*
- Katie Horn, Aeronautics, KSU — Summer 2022 – Spring 2023
  Awarded NASA OSGC Scholarship
  Research focus: *Motion Prediction of Birds to Prevent Bird Strikes with Aircraft*
- Rajat Ghimire, Aeronautics, KSU — Spring 2023
  Research focus: *Point-to-Point Ridesharing-based Air Travel with General Aviation Aircraft*
- Jarred Curtis, Aeronautics, KSU — Fall 2021 - Summer 2022
  Research focus: *Airspace Design for Integration of AAM Operations at Airports*
- Carter Verderico, Aeronautical Systems Engineering Technology, KSU — Spring 2021
  Research focus: *Operations Planning and Analysis of Small Package Delivery using Drones in the City of Kent in Ohio*

NSF REU Students

- Amina Dhaher, Aerospace Engineering, KSU — Summer 2025
  Research focus: *Public Acceptance of AAM*
- Jordan Burnett, Mechanical Engineering, Case Western Reserve University — Summer 2024
  Research focus: *Operations Planning for Food Delivery UAVs*
- Peter Hwang, Computer Science, Florida State University — Summer 2024
  Research focus: *Classifying Bird Species with AI*

University Service

Service to KSU

Committee Membership

- Strategic Research Planning Committee — 2024 – Present
- Aeronautics Curriculum Committee — 2021 - Present
- College Curriculum Committee — 2022 - Present
- Akron Public Schools Firestone Academy - Aerospace Engineering Advisory Board — 2022 - Present
- University Diversity Action Council — 2024 - Present

Faculty Lead — 2023 - Present

- KSU CAE's MS program in Aviation Management and Logistics

PhD and MS Student Thesis Committee Membership (outside of my students)

- Doctoral dissertation committee of Yibei Guo, Aerospace Engineering, CAE, KSU
  Thesis title: "Transparent Alignments of Human-Robot Interaction: Theoretical Foundation and Implementations"
- Doctoral dissertation committee of Amit Bhowmick, Materials Science (Advanced Materials and Liquid Crystal Institute) department, KSU
  Thesis title: "Liquid Crystal Based Large Aperture Lens for De-focus and Astigmatism Correction".

- MS thesis committee of Runxiang Jin, Mechatronics Engineering, CAE, KSU
  Thesis title: "Formation-Aware Distributed Trajectory Generation in Obstacles for Multi-Robot Collaborative Navigation"

Graduate Student Capstones

- Abygail Bowman, MS Student of Aviation Management and Logistics
  Project title: "Pressing Challenges for US Air Force and Space Force"
- Douglas Bitter and Alexander Lierman, MS Students of Aviation Management and Logistics
  Project title: "Easing Contract Negotiation Tensions in Aviation"
- John Finger and Carlos Ledet, MS Students of Aviation Management and Logistics
  Project title: "Reviving General Aviation in the US"

Faculty Search Committee Spring 2024

- Non-tenure track faculty position in Quality and Reliability Engineering

Faculty Advisor for Student Club 2021 – 2024

Bangladesh Student Association at Kent State University (BSA-Kent)

Service to ISU Department of Aerospace Engineering

Honors Research Program Mentor Spring 2019

- Guided an undergraduate researcher on the use of statistical tools of MATLAB
- Supervised an undergraduate research project titled "Uncertainty quantification of key airline operational metrics using aviation big data"

Professional Service

Journal and Conference Reviewer 2020 – Present

- Transportation Research Part B
- Transportation Research Part C
- AIAA Journal of Aerospace Information Systems
- AIAA Aviation
- Transportation Research Record (& Transportation Research Board [TRB] Annual Meeting)

Technical and Program Committee Member 2021 – Present

- AIAA Air Transportation Systems Technical Committee
- TRB Standing Committee on New Users of Shared Airspace
- NASA Advanced Air Mobility Working Group
- American Association of Airport Executives (AAAE) Emerging Aviation Technologies Working Group

Conference Session Organizer and Chair

- INFORMS 2022 Annual Meeting Fall 2022
  Session: Operations Management for AAM

- AIAA Aviation 2024 Summer 2024
  Session: Airport and Airline Operations I

Panelist

- Dronavation 2023: The Kent State UAS Experience Fall 2023

Publications

Aerospace Supply Chain Planning

- Dulia, Esrat F., and **Shihab, Syed A. M.**. "An Integrated Supply Chain Network Design for Advanced Air Mobility Aircraft Manufacturing Using Stochastic Optimization." *Supply Chain Analytics*, vol. 8, p. 100083, 2024. Online link.

Aerospace Surveillance Infrastructure Planning

- Dulia, Esrat F., and **Shihab, Syed A. M.**. "Designing a Surveillance Sensor Network with Information Clearinghouse for Advanced Air Mobility." *Sensors*, vol. 24, no. 3, p. 803, 2024. Online link.
- Dulia, Esrat F., and **Shihab, Syed A. M.**. "How to Negotiate with Private Investors for Advanced Air Mobility Infrastructure? An Analysis of Public Private Partnerships using Game Theory." *AIAA Aviation Forum and Ascend*, Las Vegas, July 2024. Online link.
- Dulia, Esrat F., and **Shihab, Syed A. M.**. "Building Public-Private Partnerships for Advanced Air Mobility Infrastructure using Game Theory." *Journal of Air Transportation*, pp. 1-17, 2024. Online link.
- Calhoun, Sean, Adami, Tony, Lorenzon, Jason, **Shihab, Syed A. M.**, Bair, John, Wagner, Eric, et al. "Open Framework Standards for Combined Aircraft Sensor Network for the State of Ohio to Detect and Track Lower Altitude Aircraft." *National Transportation Library*, Ohio Department of Transportation, Office of Statewide Planning and Research, no. FHWA/OH-2023-17, 2023. Online link.

Preventing and Mitigating Bird Strikes in Aviation

- Varnousfaderani, Elaheh Sabziyan, King, Jonathan, and **Shihab, Syed A. M.**. "Deep Learning for Aviation Safety: Classifying Bird Species to Prevent Bird Strikes." *AIAA Aviation Forum and Ascend*, Las Vegas, July 2025 (in press).
- Varnousfaderani, Elaheh Sabziyan, and **Shihab, Syed A. M.**. "Bird Strikes in Aviation: A Systematic Review for Informing Future Directions." *Aerospace Science and Technology*, vol. 163, p. 110303, 2025. Online link.
- Varnousfaderani, Elaheh Sabziyan, **Shihab, Syed A. M.**, and Schofield, Collin. "Safe to Takeoff: Strategic Deconfliction with Bird Flight Track Predictions to Prevent Bird Strikes with Aircraft." *AIAA Aviation Forum and Ascend*, Las Vegas, July 2024. Online link.
- Varnousfaderani, Elaheh Sabziyan, and **Shihab, Syed A. M.**. "Collision-Free Takeoff: Preventing Bird Strikes with Aircraft by Tactical Deconfliction under Bird Movement Uncertainty." *AIAA Aviation Forum and Ascend*, Las Vegas, July 2024. Online link.
- Varnousfaderani, Elaheh Sabziyan, and **Shihab, Syed A. M.**, "Bird Movement Prediction Using Long Short-Term Memory Networks to Prevent Bird Strikes with Low Altitude Aircraft," *AIAA Aviation 2023 Forum*, San Diego, June 2023. Online link.

Aircraft Dispatching / Flight Scheduling

- Dulia, Esrat F., Adams, Caleb Williams and **Shihab, Syed A. M.**. "Low-Noise Route and Operations Planning for Food Delivery Unmanned Aerial Vehicles." *AIAA Aviation Forum and Ascend*, Las Vegas, July 2025 (in press).
- Varnousfaderani, Elaheh Sabziyan, **Shihab**, **Syed A. M.**, and Dulia, Esrat F.. "DeepDispatch: Deep Reinforcement Learning-Based Vehicle Dispatch Algorithm for Advanced Air Mobility." *Journal of Air Transportation*, vol. 33, no. 1, pp. 26-47, 2025. Online link.
- **Shihab, Syed A. M.**, Wei, Peng, Shi, Jie and Yu, Nanpeng, "Optimal eVTOL Fleet Dispatch for Urban Air Mobility and Power Grid Services." *AIAA Aviation 2020 Forum*, Virtual Conference, June 2020. Online link.
- **Shihab, Syed A. M.**, Wei, Peng, Jurado, Daniela, Arango, Rodrigo M. and Bloebaum, Christina L., "By Schedule or On-demand? – A Hybrid Operations Concept for Urban Air Mobility." *AIAA Aviation 2019 Forum*, Dallas, TX, USA, June 2019. Online link.

Cost-Benefit and Societal and Environmental Impact Analysis of AAM

- Dulia, Esrat F., Sabuj, Mir S., and **Shihab, Syed A. M.**. "Benefits of Advanced Air Mobility for Society and Environment: A Case Study of Ohio." *Applied Sciences*, vol. 12, no. 1, p. 207, 2021. Online link.

Aviation Industry

- Pradeep, Priyank, **Shihab, Syed A. M.,** and Thipphavong, David. "FAA authorizes simultaneous beyond-visual-line-of-sight drone flights, and other breakthroughs." *Aerospace America*, AIAA, December 2024. Online link.
- Pradeep, Priyank, **Shihab, Syed A. M.,** and Thipphavong, David. "Airline profitability on the horizon after three turbulent years despite air traffic controller shortages." *Aerospace America*, AIAA, December 2023. Online link.
- Puranik, Tejas G., Pradeep, Priyank, and **Shihab, Syed A. M.**. "Air transportation encounters inflationary headwinds on its recovery from pandemic." *Aerospace America*, December 2022. Online link.

Pricing and Revenue Management for Aviation

- **Shihab, Syed A. M.,** and Wei, Peng. "A Deep Reinforcement Learning Approach to Seat Inventory Control for Airline Revenue Management." *Journal of Revenue and Pricing Management*, vol. 21, pp. 1-17, 2021. Online link.
- **Shihab, Syed A. M.**, Logemann, Caleb, Thomas, Deepak-George, and Wei, Peng, "Autonomous Airline Revenue Management: A Deep Reinforcement Learning Approach to Seat Inventory Control and Overbooking." RL for Real Life Workshop, *International Conference on Machine Learning*, Long Beach, CA, USA, June 2019. Online link.
- **Shihab, Syed A. M**, "DeepARM: An Airline Revenue Management System for Dynamic Pricing and Seat Inventory Control using Deep Reinforcement Learning [Doctoral Dissertation, Iowa State University]," 13 July 2020. Online link.

Network/Route Planning and Systems Engineering

- **Shihab, Syed A. M.**, Wei, Peng, and Bloebaum, Christina L. "A Data-Driven Decision Making Framework for Value-Based Engineering Design of Complex Network Systems." *AIAA Aviation*, Dallas, TX, USA, June 2019. Online link.
- Kannan, H., **Shihab, Syed A. M**, Zellner, M., Salimi, E., Abbas, A., & Bloebaum, Christina L.. "Preference Modeling for Government-Owned Large-Scale Complex Engineered Systems: A Satellite Case Study." *Disciplinary Convergence in Systems Engineering Research*, Cham: Springer International Publishing, pp. 513-529, 2017. Online link.
- Kannan, Hanumanthrao, **Shihab, Syed A. M.**, Zellner, Maximilian, Salimi, Ehsan, Abbas, Ali E. and Bloebaum, Christina L., "Preference Modeling for Government-Owned Large-Scale Complex Engineered Systems: A Satellite Case Study." *Conference on Systems Engineering Research (CSER)*, Los Angeles, CA, USA, March 2017. Online link.
- **Shihab, Syed A. M.**, and Uddin, Mohammad N. "Design and Performance Analysis of Centrally Seeded, Long Reach, Cost Optimized Hybrid DWDM TDMA PON." *International Conference on Electronics and Communication Engineering*, Dhaka, Bangladesh, December 2012. Online link.

Selected Talks and Presentations

- NSF REU Workshop, “Mastering the Art of Scientific Writing”. NSF REU Workshop at Kent State University, Kent, OH, June 2025.
- NSF REU Workshop, “Mastering the Art of Scientific Writing”. Kent State University, Kent, OH, June 2024.
- Dronavation 2023 Panel Discussion, “The Kent State UAS Experience”. Online, November 2023.
- INFORMS Annual Meeting, “Bird Movement Prediction using LSTM-RNN to Prevent Bird Strikes with Low Altitude Aircraft”, Indianapolis, IN, October 2022.
- INFORMS Annual Meeting, “DeepDispatch: A Deep Reinforcement Learning-Based Vehicle Dispatch Algorithm for Advanced Air Mobility”, Indianapolis, IN, October 2022.
- AGIFORS Revenue Management Conference, “Competition-based Airline Revenue Management with Multi-agent Reinforcement Learning”, Online, April 2022
- INFORMS Annual Meeting, “Optimal eVTOL Fleet Dispatch for Urban Air Mobility and Power Grid Services”, Online, October 2020.
- Iowa State University, Department of Aerospace Engineering, Course: Reinforcement Learning and Autonomy, “DeepARM: A Dynamic Pricing and Seat Inventory Control System for Airline Revenue Management using Deep Reinforcement Learning”, Ames, IA, USA, December 2019.
- INFORMS Annual Meeting, “By Schedule or On-Demand? - A Hybrid Operational Concept for Urban Air Mobility Services”, Seattle, WA, USA, October 2019.
- INFORMS Annual Meeting, “Towards the Next Generation Airline Revenue Management: A Deep Reinforcement Learning Approach to Seat Inventory Control and Overbooking”, Seattle, WA, USA, October 2019.
- AIAA Aviation Forum, “By Schedule or On-Demand? - A Hybrid Operational Concept for Urban Air Mobility Services”, Dallas, TX, USA, June 2019.
- AIAA Aviation Forum, “A Data-Driven Decision Making Framework for Value-Based Engineering Design of Complex Network Systems”, Dallas, TX, USA, June 2019.

- AGIFORS Revenue Management Study Group Meeting, "Towards the Next Generation Airline Revenue Management: A Deep Reinforcement Learning Approach to Seat Inventory Control and Overbooking", Panama City, Panama, May 2019.

Awards and Recognitions

- My research on *Preventing Bird Strikes with AI* has been **featured** and covered in several interviews and articles:
  - Reporter: Andrew Zaleski. Article title: "How AI could make air travel safer, smarter, and smoother". Publisher: Dropbox Blog, Dropbox.
  - Interviewed by KSU President Todd Diacon on What's the Big Idea – Episode 2: Online link
  - Reporter: April McClellan-Copeland. Article title: "Kent State Professor Believes Artificial Intelligence Can Prevent Bird Strikes." Publisher: Kent State Today. Online link
  - Reporter: Chloe Zofchak. Article title: "Professor Believes Artificial Intelligence May Help Pilots Avoid Bird Strikes." Publisher: Kent State Today. Online link
- **Featured** in KSU's Center of Teaching and Learning's February 2023 Newsletter as the February *Faculty of the Month* for my "**continuous efforts at being proactively student-centered and commitment to inclusive teaching**"
- **Recognition** of expertise in *AI for aviation*: interviewed by investigative reporter Rebecca Heilweil of Fedscoop on my evaluation of the *state of AI deployment by FAA in their processes and tools.* My evaluation is referenced and quoted in three articles:
  - Reporter: Rebecca Heilweil. Article title: "The FAA is probing how to use AI for national airspace safety". Publisher: FedScoop. Online link
  - Reporter: Rebecca Heilweil. Article title: "In deploying AI, the Federal Aviation Administration faces unique challenges." Publisher: FedScoop. Online link
  - Reporter: Sandy Murdock. Article title: "AI at FAA- what's up status check by Investigative Reporter." Publisher: JDA Journal. Online link
- **Interviewed and featured** in KSU's Kent State Today magazine's article and video on Center for Advanced Air Mobility at KSU CAE. Online link

Professional Affiliations

- American Institute of Aeronautics and Astronautics (AIAA), *Member*
- Institute for Operations Research and the Management Sciences (INFORMS), *Member*
- The Airline Group of the International Federation of Operational Research Societies (AGIFORS) , *Member*

Computer Skills

MATLAB, Python, C/C++, Gurobi

Languages

English (full professional proficiency), Bengali (native), Hindi (intermediate)