Joey Paul Eli Haynes

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Education

University of Texas at Austin, Austin, TX — August 2024 - Present
Master of Science (M.S.) in Computer Science — Graduation: December 2026
Coursework: Planning, Search, and Reasoning Under Uncertainty
Cumulative GPA: 4.00/4.00

Southern New Hampshire University, Manchester, NH — January 2021 - June 2024
Bachelor of Science (B.S.) with Honors — Graduation: June 2024
Major in Computer Science, Minor in Applied Mathematics
Cumulative GPA: 4.00/4.00

Research Interests

Predictive Modeling, Bayesian Estimation for Mobile Robots, Cyber-Physical Systems (CPS), Game Theory, Inverse Problems, Probabilistic Programming, Computer Perceptions

Conference Proceedings

J. P. Haynes, M. J. Bhalerao, W. T. Honeycutt, J. K. Allen, and F. Mistree. *Predictive Modeling for Public Policy Design: The Impact of Artificial Lights at Night (ALAN) on Bird Strikes.* ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, DETC2024-143780, Washington, D.C., August 2024.

Journal Articles

J. P. Haynes, M. J. Bhalerao, W. T. Honeycutt, J. K. Allen, and F. Mistree. *Engineering Informatics for Aviation Safety: Machine Learning-Based Prediction of Bird Strikes Using a Model-Based CPSS Design.* Submitted to ASME Journal of Computing and Information Science in Engineering (JCISE).

Invited Talks

Predictive Modeling for Public Policy Design: The Impact of Artificial Lights at Night (ALAN) on Bird Strikes. 42nd ASME/AIAA Regional Symposium, Oral Roberts University, Tulsa, OK, April 2024.

Engineering Informatics for Aviation Safety: Machine Learning-Based Prediction of Bird Strikes Using a Model-Based CPSS Design. Webinar given to the SRL@OU Conversations Series, April 2024.

Oral Presentations

Predictive Modeling for Public Policy Design: The Impact of Artificial Lights at Night (ALAN) on Bird Strikes. [Co-presented with Mayank Bhalerao]. ASME Computers and Information in Engineering Conference (CIE), Washington, D.C., August 2024.

Adaptive Manufacturing Systems: Leveraging Predictive Modeling and Cyber-Physical-Social Systems for Real-Time Adaptation. **[Poster]**. NSF/ASME Student Design Essay Competition, ASME Computers and Information in Engineering Conference (CIE), Washington, D.C., August 2024.

Experience

Systems Realization Laboratory at OU, Norman, OK — August 2023-Present
Remote Research Intern advised by Dr. Janet K. Allen and Dr. Farrokh Mistree at the University of Oklahoma

- Collaborated in a team of researchers as lead author for the ALAN project, investigating the impact of artificial lights at night (ALAN) on bird strike occurrences.
- Helped define the research problem by identifying knowledge gaps in the existing work, illustrating a method of predictive modeling informed by cyber-physical-social systems (CPSS).
- Conducted exploratory data analysis (EDA) using GIS tools, integrating data including the FAA wildlife strike database, BirdCast migration forecasts, and light pollution rasters.
- Developed a spatiotemporal predictive model using random forest regression with GIS data, achieving an R-squared value of 0.80.
- Applied k-fold cross-validation and hyperparameter tuning to optimize model performance, achieving an average absolute error of 0.87 strikes.
- Winner of the NSF/ASME student design essay contest for an essay on adaptive manufacturing systems using predictive modeling and cyber-physical-social systems (CPSS).
- Authored 2 first-author publications (IDETC, JCISE) and presented at 4 technical sessions as part of my work in this lab.

Walmart, Yukon, OK — June 2020 - Present
Sales Associate

- Balanced a customer-facing role throughout undergraduate studies, developing strong time management and leadership skills.
- Trained and mentored over 20 employees, enhancing team efficiency and communication.
- Managed merchandise presentation and facility maintenance, contributing to a 5.5% YoY sales increase in a $100M/year facility.

Selected Projects

Portfolio Website — jpthefish.com — December 2022 - Present

- Deployed a full-stack web application with daily traffic using React.js, Firebase, and SQL.
- Created a chatroom with sign-in authentication, back-end security logic, and word filtering.
- Designed and implemented a responsive UX design with careful attention to visual accessibility.

Replication of 3D Scenes in OpenGL with Ronald Bishop — Spring 2024

- Developed an interactive 3D graphics scene using OpenGL to replicate real-world 2D images into a navigable virtual environment.
- Modularized the shaders for vertex and fragment processing, optimizing the rendering process and enhancing the realism of textures, lighting, and material properties.
- Implemented a user interface with keyboard and mouse controls for navigating the scene, exploring orthographic and perspective views, and simulating camera movements.
- Explored the applicability of graphics pipeline techniques to computer vision by simulating an example of object recognition and spatial analysis within a controlled 3D environment.

Grazioso Salvare Analytics Dashboard with Dr. Sherri Maciosek — Spring 2023

- Developed an analytics dashboard for an Austin-based rescue-animal company using Python, MongoDB, and the Dash framework.
- Implemented interactive data visualization components, including tables, charts, and geolocation maps, enabling stakeholders to filter and analyze animal shelter data by relevant criteria.

Honors and Awards

NSF/ASME Student Design Essay Competition Award – $1,500 — June 2024
Graduation with Honors and Distinction at SNHU (Summa Cum Laude) — May 2024
Alpha Sigma Lambda — November 2023

Service and Organizations

Member, Association for Computing Machinery (ACM) — September 2024 - Present
Member, American Society of Mechanical Engineers (ASME) — July 2024 - Present
Member, National Society of Leadership and Success (NSLS) — March 2024 - Present
Mentor, Multicultural STEM Community Club at SNHU — April 2024 - May 2024
Volunteer Contributor, Wikimedia Foundation — May 2020 - January 2022

Technical Skills

Languages: Python, SQL, Java, C/C++, MATLAB, JavaScript
Data technology: PostgreSQL, MySQL, MongoDB, Firebase/Firestore
Tools and frameworks: Git, AWS, Docker, OpenGL, React, Tableau

Certifications

Google Advanced Data Analytics Certificate, Coursera Inc. — January 2024
People and Business Leadership Certificate, Bellevue University — March 2021
GED Mathematics Credit (top 1-8% of high school graduates, age 16) — December 2018

Languages and Other Skills

Intermediate Spanish (B1) and French (B2) Language Fluency
Classical and Jazz Piano

References

Dr. Farrokh Mistree
Professor and L.A. Comp Chair at OU, **Email:** farrokh.mistree@ou.edu, **Tel:** (404) 502-9086

Dr. Janet K. Allen
Professor and John and Mary Moore Chair at OU, **Email:** janet.allen@ou.edu, **Tel:** (405) 550-3969

Dr. Sherri Maciosek
Adjunct Professor at SNHU, **Email:** s.maciosek@snhu.edu, **Tel:** (715) 479-3408