Joey Paul Eli Haynes

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Education		
Education	**University of Texas at Austin**, Austin, TX Master of Science (M.S.) in Computer Science Coursework: Planning, Search, and Reasoning Under Uncertainty Cumulative GPA: 4.00/4.00	August 2024 - Present Graduation: May 2026
	Southern New Hampshire University, Manchester, NH Bachelor of Science (B.S.) with Honors Major in Computer Science, Minor in Applied Mathematics Cumulative GPA: 4.00/4.00	January 2021 - June 2024 Graduation: June 2024

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.

Projects		
	Portfolio Website — jpthefish.com	December 2022 - Present

Messaging platform where users collaborate and share design and research ideas
- 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

Course project, CS-330 Computational Graphics and Visualization
- 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

Course project, CS-340 Client/Server Development
- 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
Volunteer Contributor, Wikimedia Foundation	May 2020 - January 2022

Technical Skills

Languages: Python, SQL, R, 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)	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