Jacob Epstein

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EDUCATION

• **University of Massachusetts, Amherst**　　　　　　　　　　　*September 2021 - May 2025 (expected)*
Bachelors of Science in Computer Science, Bachelors of Science In Mathematics　　　　　　　Amherst, MA

- GPA: 3.99/4.00
- Commonwealth Honors College student. Thesis Title: *A Transport-Based Loss Function for BirdFlow*. Thesis Advisor: Daniel Sheldon
- *Coursework*: Machine Learning, Artificial Intelligence, Algorithms, Computer Architecture, Linear Algebra, Abstract Algebra, Probability and Statistics, Real Analysis, Complex Analysis, Functional Analysis, Measure Theory
- *Honors and Awards*: Dean's List, Dean's Award, John and Abigail Adams Scholarship (all semesters). Dr. Howard R. Smith Summer Research Award in Information and Computer Science (Summer 2023).

RESEARCH EXPERIENCE

• **UMass Amherst, Daniel Sheldon Research Group**　　　　　　　　　　　　　*June 2023 - Present*
Undergraduate Research Assistant　　　　　　　　　　　　　　　　　　　　　　Amherst, MA

- Collaborated with researchers at UMass and Cornell on the BirdFlow project, an effort to model the migration paths of birds from citizen science observations
- Implemented and evaluated the performance of Bayesian Optimization algorithms for BirdFlow hyperparameter tuning, and presented results to the BirdFlow team.
- Experimented with alternative BirdFlow model structures that enable learning from an expanded set of marginals.
- Proposed experiments with an Optimal Transport-based loss function for BirdFlow, which will enable more expressive computation of distance between model and ground truth marginals. Presented proposed experiments to the research group.

• **Public Interest Technology - New England (PIT-NE)**　　　　　　　　　　　*May 2024 - July 2024*
Impact Tech Fellow　　　　　　　　　　　　　　　　　　　　　　　　　　　　Boston, MA

- Participated in the inaugural PIT-NE Fellowship, a collaborative cross-institutional program where students partner with nonprofits to make an impact on social and environmental problems using Computer Science skills
- Collaborated with a team of three students to analyze a crowdsourced set of observations of trees in India, supplied by the nonprofit Seasonwatch
- Performed data cleaning, designed pipelines to remove outliers and select representative observations to serve as weekly baselines, and designed a probabilistic method to infer flowering and fruiting times from observations.
- Presented results to an expert panel, at a community showcase, and at an invited talk with SeasonWatch and affiliates. Delivered a written report and a documented open-source codebase to SeasonWatch.

• **UMass Lowell, Human-Robot Interaction Lab**　　　　　　　　　　　*June 2022 - August 2022*
Undergraduate Research Assistant　　　　　　　　　　　　　　　　　　　　　Lowell, MA

- Collaborated with a team of graduate students to design a virtual reality User Interface (UI) for operating Boston Dynamics' Spot robot
- Implemented UI elements for viewing Spot's sensor data and maps of the environment, sending manipulation and navigation goals, and docking
- Presented results to the lab at an end-of-summer showcase

PUBLICATIONS　　　　　　　　　　　　　　　　　　　　C=CONFERENCE, W=WORKING PAPER

[W.1]　Miguel Fuentes, *Jacob Epstein*, Adriaan Dokter, Benjamin Van Doren, Dave Slager, Ethan Plunkett, and Daniel Sheldon. **Learning Migration Models from Marginals with Site Fidelity**.

[C.1]　Gregory LeMasurier, James Tukpah, Murphy Wonsick, Jordan Allspaw, Brendan Hertel, *Jacob Epstein*, Reza Azadeh, Taskin Padir, Holly A. Yanco, and Elizabeth Phillips. **Comparing a 2D Keyboard and Mouse Interface to Virtual Reality for Human-in-the-Loop Robot Planning for Mobile Manipulation**. The 33rd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), Pasadena, California, August 2024

WORK EXPERIENCE

- **University of Massachusetts, Amherst** *September 2024 - Present*
  Teaching Assistant - CS 320 (Software Engineering) Amherst, MA
  - Mentor students in CS 320 to bring semester-long software engineering projects from idea to reality using an AGILE methodology
  - Facilitate group work on software engineering projects, communicating with students if necessary. Grade and provide students with feedback on assignments.
  - Communicate with professors and course staff to ensure fair and consistent grading