JACKSON ESHBAUGH

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Bethlehem, PA — 18020, USA

Education

- **Lafayette College** *August 2023–May 2027*
  B.S., Computer Science Easton, PA
  - GPA: 4.00/4.00

- **Lafayette College** *August 2023–May 2027*
  A.B., French Language Easton, PA
  - GPA: 4.00/4.00

Research Interests

Topics

Computational Linguistics Machine Learning Interpretability
Theoretical Foundations of Artificial Intelligence

Guiding Questions

How do linguistic structure and semantics interact in multilingual NLP models?
How does language work—in computers and in humans?
How do we make neural networks more transparent?

Publications & Preprints

C=Conference, J=Journal, P=Preprint, S=In Submission, T=Thesis

P.1 **Eshbaugh, J**. Fidelity Isn't Accuracy: When Linearly Decodable Functions Fail to Match the Ground Truth. 2025. arXiv:2506.12176.

S.1 **Eshbaugh, J**., Tiwari, C., and Silveyra, J. A Modular and Multimodal Generative AI Framework for Urban Building Energy Data: Generating Synthetic Homes. 2025. Submitted to *Energy & Buildings*. arXiv:2509.09794.

Posters & Presentations

[1] **Eshbaugh, J.** (Oct 2025). "Synthetic Homes: A Modular and Multimodal Generative AI Framework for Urban Building Energy Data." *CyberAccelerate Poster Session at KINBERCON 2025*, Lancaster, PA. [poster]

[2] **Eshbaugh, J.** (Sep 2025). "Synthetic Homes: A Modular and Multimodal Generative AI Framework for Urban Building Energy Data." *Lafayette College Bicentennial Weekend Poster Session*, Easton, PA. [poster]

Research Experience

- **Independent Research—Neural Network Interpretability** *April 2025 - Present*
  Department of Computer Science, Lafayette College Easton, PA
  - Investigated when linear models fail to faithfully represent neural networks
  - Designed experimental framework comparing surrogate fidelity vs. task accuracy across regression tasks
  - Proposed the λ-score as a diagnostic metric; demonstrated high surrogate fidelity does not imply accuracy
  - Implemented full ML pipeline: network training, surrogate evaluation, statistical analysis
  - Manuscript reviewed by Dr. Jorge Silveyra and Dr. Jeffrey Pfaffmann prior to submission
  - Result: Preprint "Fidelity Isn't Accuracy" (arXiv:2506.12176).

- **EXCEL Scholar—Building Energy & Generative AI** *June 2025 - Present*
  Department of Computer Science, Lafayette College [🌐] Easton, PA
  - Advisor: Dr. Jorge Silveyra (Lafayette College)
  - Collaborator: Dr. Chetan Tiwari (Georgia State University)
  - Developed neural network approach to recommend energy efficiency retrofits at neighborhood scale
  - Used EnergyPlus™ simulations and generative AI for urban building energy modeling
  - Co-authored manuscript submitted to *Energy & Buildings* (arXiv:2509.09794)
  - Presented research at KINBERCON 2025 and Lafayette Bicentennial Weekend

- **Honors Thesis Research—Computational Linguistics** *February 2025 - Present*
  Departments of Computer Science & Language and Literary Studies, Lafayette College Easton, PA
  - Advisors: Dr. Sofia Serrano (Computer Science) and Dr. Maria Hernandez (French)
  - Developing FRIdiom: an annotated corpus for detecting idiomatic expressions in French
  - Applying back-translation and neural methods to improve figurative language handling in multilingual MT
  - Using interpretability techniques from prior work to probe language model representations
  - Dataset paper in preparation for submission
- **ACL Manuscript Review** *October 2025 - Present*
  Department of Computer Science, Lafayette College Easton, PA
  - Collaborated as a secondary reviewer with Dr. Sofia Serrano on peer review of ACL Rolling Review manuscripts
  - Evaluated research methodology, experimental design, and validity of scientific claims
  - Drafted preliminary reviews for each submission which were refined through discussion with Dr. Serrano

Teaching Experience

- **Department of Computer Science, Lafayette College [🌐]** *August 2024 - Present*
  Teaching Assistant Easton, PA
  - Assist professors with teaching duties by helping students during class meetings.
  - Praised by students as an outstanding teacher who cares and can explain complex things in ways that make sense.
  - More information on my teaching page.
- **Academic Resource Hub, Lafayette College [🌐]** *August 2024 - Present*
  Mentored Study Group Leader Easton, PA
  - Hold two review sessions per week, covering course content.
  - Produce materials such as worksheets and presentations for sessions.
  - Praised by students as an outstanding teacher who cares and can explain complex things in ways that make sense.
  - More information on my teaching page.

Skills

- **Programming Languages:** Python, Java, JavaScript, C, ML
- **Machine Learning:** PyTorch, TensorFlow, NumPy
- **Other Tools & Technologies:** LaTeX

Honors and Awards

- **Marquis Scholarship** *May 2023*
  Lafayette College [🌐]
  - Demonstrated intellectual curiosity in addition to superior academic achievement.
  - Recipients display the Marquis' ideals of global citizenship, scholarly pursuits, leadership, and concern for others.
- **Dean's List** *F23, S24, F24, S25*
  Lafayette College
  - Achieved a Semester GPA of 3.60 or higher.

Volunteer Experience

- **Audio/Visual Specialist** *July 2021 - Present*
  Hope Alliance Church [🌐]
  - Design and operate weekly worship slides and sermon visuals
  - Configure live stream and projection systems for services
  - Run slides and broadcast during live events
  - Troubleshoot technical issues quickly and independently
  - Maintain and reset the worship space after services
  - Apply skills in graphic design, live sound, and audiovisual tech
  - Serve faithfully by supporting worship through technical service
- **Audio/Visual Specialist** *September 2023 - Present*
  Lafayette DiscipleMakers Christian Fellowship [🌐]
  - Similar service to the above with no live stream component

Certifications

- **Deep Learning Specialization** *June 2025*

Additional Information

Languages Spoken

English (Native Tongue), French (Fluent; Professional Competency)

Interests

Music (Jazz Vocals, Trombone, Piano, Composition); Photography and Photo Editing; Videography and Video Editing