# Evan Halloran

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## EDUCATION

**Indiana University Bloomington** **December 2025**
**Luddy School of Informatics, Computing, and Engineering** **GPA: 3.856 / 4.0**
*Bachelor of Science in Pure Mathematics and Computer Science* *Hutton Honors Notation*
*Specialization: Artificial Intelligence*
*Minor: Linguistics*

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## RESEARCH EXPERIENCE

**West Virginia University Mathematics REU Internship** **Summer 2025**

- Studied a Keyfitz-Kranzer type system of hyperbolic conservation laws with applications in ecology and physics
- Implemented the LLF flux-splitting scheme in Matlab to numerically analyze behavior of solutions in the phase-plane
- Presented at the university's summer research symposium; received acclaim from judges

**Indiana University Mathematics REU Internship** **Summer 2024**

- Researched bifurcation theory and phase transition dynamics to model binary systems and fluid separation
- Applied center manifold theory to reduce the Cahn-Hilliard equation over planar lattices to a system of ODEs
- Presented work to other students and mentors at a state-wide REU conference for mathematical sciences; work featured at JMM 2025

**IU Mathematics Directed Reading Program** **Fall 2022**

- Researched advanced topics in Fourier analysis with the help of a graduate student mentor
- Shared my findings with the other participants in the program at an end-of-semester conference

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## WORK EXPERIENCE

**IU Mathematics Department** **Fall 2022 - Fall 2023**
*Finite Mathematics/College Algebra TA*

- Proctored exams, hosted weekly tutoring sessions, and graded homework in a timely manner for the department

**Bloomington Drosophila Stock Center** **Spring 2021 - Present**
*Stock Caretaker*

- Nurtured stocks of genetically-mutated fruit flies for a genomics lab and treated sick colonies with various medicines

**Mays Greenhouse** **Spring 2020 - Fall 2021**
*Support Service*

- Facilitated construction of greenhouses and garages and aided customers in purchasing plants and outdoor furniture

**Indiana University Recreational Sports** **Summer 2019**
*Lifeguard and Swim Instructor*

- Safely monitored outdoor pool as lifeguard, instructed group swim lessons, and received CPR certification

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## PAPERS

- Culver J, Ayres A, **Halloran E**, Lin R, Peng E, Tsikkou C, "An analysis of the Riemann problem for a 2x2 system of Keyfitz-Kranzer type balance laws with a time-dependent source term", *Physics of Fluids*.
- Culver J, Ayres A, **Halloran E**, Lin R, Peng E, Tsikkou C, "An analysis of the Riemann problem for a 2x2 system of Keyfitz-Kranzer type conservation laws using shadow waves and Dafermos regularization", under review.
- Grossman J, **Halloran E**, Wang S, "Cahn-Hilliard equations on lattices: dynamic transitions and pattern formations", *Communications in Mathematical Sciences.*

## RELEVANT COURSEWORK

Data Structures and Algorithms, Artificial Intelligence, Data Analysis and Mining, Autonomous Robotics, Machine Learning
Linear Algebra, Real Analysis I & II, Abstract Algebra I & II, Partial Differential Equations I & II, Probability Theory
Phonetics, Phonology, Syntax, Field Methods in Sociolinguistics

## INVOLVEMENT

**Alpha Phi Omega** **Spring 2023 - Spring 2025**

- Chaired a national co-ed fraternity at Indiana University centered around leadership, fellowship, and service
- Established various volunteer networks with the local Adopt-A-Road program and Hoosier Hills food pantry

**Indiana University Student Foundation** **Fall 2022 - Spring 2024**

*Membership Committee and Alumni Affairs Committee*

- Authored the foundation's newsletter, tracked member attendance, and planned inter-foundation events
- Fostered connection with foundation alumni and curated public display cases of Little 500 memorabilia

## AWARDS

**Corey M. Manack Memorial Scholarship** (*three time recipient)* **Spring 2023, Spring 2024, Spring 2025**
**Mathematics Departmental Award for Academic Excellence** **Spring 2022**

## TECHNICAL SKILLS

**Languages:** Python, Java, C, Racket (Lisp), SQL, Matlab, HTML, CSS
**Operating Systems:** UNIX, ROS2

## INTERESTS

historical linguistics, classical piano, entomology/insects, rock climbing, swimming