Jesse He

Curriculum Vitae

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Education

The Ohio State University, Columbus, OH.
Expected May 2022

Bachelor of Science in Mathematics, Honors Specialization

Bachelor of Arts in Computer and Information Science

GPA: 3.876

Research Experience

SU2021 **Emerging Issues in Cybersecurity REU**, *New Mexico Institute of Mining and Technology*, Sorocco, NM (online).

- Advised by Dr. Subhasish Mazumdar, developed a tool to generate synthetic tabular data with geometrically defined classes
- Investigated the behavior of machine learning explanation framework LIME using generated synthetic tabular data

Publications

Jesse He and Subhasish Mazumdar. "Using Polygonal Data Clusters to Investigate LIME". In: *Proceedings of the 14th International Conference on Information Society (i-Society)*. Nov. 2021. (Extended version to appear in *International Journal for Infonomics*, Volume 14, Issue 1.)

Teaching Experience

AU2021 **Student Grader, Math 5590H/5111 Honors Abstract Algebra I**, *The Ohio State University Department of Mathematics*.

- Graded weekly homework assignments for a combined honors undergraduate and master's level course in abstract algebra covering groups, rings, and polynomials using exercises from Dummit and Foote's *Abstract Algebra*, Ch. 1-9.

AU2020-SP2021 **Undergraduate Grader, CSE 3521 Survey of Artificial Intelligence I**, *The Ohio State University Department of Computer Science and Engineering*.

- Evaluated and gave feedback for assignments in introductory artificial intelligence including problem solving, knowledge representation, and machine learning
- Spring 2021 worked for experimental section combining material from AI II with greater emphasis on mathematical underpinnings of machine learning
- Held regular office hours

SP2020 **MMC Digital Sandbox Project Group Instructor**, *Ohio State University Media, Marketing, and Communications Scholars*.

- Developed and taught a 7-week project-based course in LaTeXwhich covered document structure, mathematical typesetting, and standard packages
- Also served as a Professional Development Co-Curricular for OSU's Second Year Transformational Project Program

AU2019 **Undergraduate Grader, CSE 2221**, *The Ohio State University Department of Computer Science and Engineering*.

- Graded assignments in an introductory software engineering course covering design-by-contract principles, mathematical modeling of software functionality, component-based software from client perspective, and layered data representation
- Aided lab instruction and held regular office hours

Presentations

Conference Presentations

27 Oct. 2021 — "Using Polygonal Data Clusters to Investigate LIME," 14th International Conference on Information Society (i-Society). Dún Laoghaire, Ireland (virtual), October 2021.

Seminar Presentations

What Is...? SU2021 — "What Is Arrow's Impossibility Theorem?"

Reading Classics SP2021 — "A History of Computational Linear Algebra: The Theory of Tables of Numbers Through Time"

Reading Classics AU2020 — "Tuning, Temperament, Timbre, and Twos: Why Rectifying Resonant Ratios Requires Roots"

Reading Classics SP2020 — "Deduced and Demonstrated Difficulties in Democratically Determining Decisions"

Selected Coursework

Mathematics

Math 7852	Differential Topology II	*(Graduate, Planned)*
Math 6702	Differential Geometry	*(Graduate, Planned)*
Math 6701	Differentiable Manifolds	*(Graduate, In Progress)*
Math 4570	Applied Algebraic Topology	
Math 4193	Group Studies: Category Theory in Context	

Computer Science

CSE 5339	Intermediate Studies in Algorithms: TDA in Neuroscience	*(Planned)*
CSE 6331	Algorithms	*(Graduate, In Progress)*
CSE 3321	Automata and Formal Languages	
CSE 3521	Artificial Intelligence I	

Technical Skills

Programming	Python, C, C++, C#, Java, Javascript/HTML/CSS, Matlab
Other	Git, LaTeX

Languages

Mandarin	Conversational	Japanese	Basic
Spanish	Basic		

Selected Interests

Mathematics and Computing	Topological Data Analysis, Algebraic and Differential Topology, (Discrete) Morse Theory, Manifold Learning
Other	Digital Music Synthesis, Music Theory and Composition, Cooking, Swimming