Curriculum Vitae

John Wesley Hostetter

Bowling Green, KY 42104

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I develop methodologies to construct human-readable neural architectures that may facilitate knowledge transfer. These systems —self-organizing neuro-fuzzy networks, may substitute traditional feed-forward neural networks.

Professional Appointments

Western Kentucky University, Bowling Green KY

Assistant Professor of Analytics and Information Systems August 2025 – Present

Gordon Ford College of Business *In-Person*

- Teaching two sections of BDAN 250: Introduction to Analytics, 34 undergraduate students each

Research & Development Experience

North Carolina State University, Raleigh NC

Graduate Research Assistant Jan. 2021 – Aug. 2021 & Jan. 2022 – May 2025

Research Group: Improving Undergraduate STEM Education (IUSE) *Remote*

- Conduct empirical research on improving undergraduate learning using Intelligent Tutoring Systems
- Oversaw setup of **18 ML models across 8 IRB studies involving a total of 2,770 human subjects**

Select Research Contributions:

- Created the **first neuro-fuzzy network (NFN) for reinforcement learning in computer vision** (*dissertation*)
- Designed the **first model-free, offline reinforcement learning NFN**; later published in AAMAS 2023 *(first author)*
- Delivered real-time personalized explanations in ITSs; later published in IVA 2023 *(first author & best paper finalist)*
- Extract transparent knowledge from deep neural networks; later published in FUZZ IEEE 2023 (*first author*)

Global Data Consultants IT Solutions

Application Developer June 2018 – August 2018

Internship *In-Person*

- Built a cross-platform mobile application using Xamarin Forms with Model-View-ViewModel architecture where clients may approve/reject contractors' timesheets
- Microsoft Xamarin Certified Professional

Teaching & Instructional Design Experience

The Artificial Intelligence Academy at NC State University

Assistant Instructor July 2022 – June 2024

Courses: (1) Introduction to Artificial Intelligence and (2) Machine Learning *Remote*

- Taught a total of approximately 1,000 industry experts (e.g., NASA, Lexmark, JPMorgan Chase & Co.)
- Sponsored by the Department of Labor to prepare entry-level AI professionals for industry partners

Graduate Service Assistant May 2020 – August 2020

Course: Data Mining *Remote*

- Developed course curriculum, workshop material and teacher solutions

North Carolina State University, Raleigh NC

Graduate Teaching Assistant August 2021 – December 2021

CSC 422/522 Automated Learning and Data Analysis *Hybrid*

- Assisted teaching 68 undergraduate and 150 graduate students on support vector machines, deep learning, etc.

August 2020 – December 2020

CSC 422/522 Automated Learning and Data Analysis *Remote*

- 45 undergraduate and 107 graduate students

January 2020 – May 2020

CSC 333 Automata, Grammars, and Computability *In-Person & Later Remote*

- 69 students on theory of computation topics such as regular languages, Turing machines, etc.

August 2019 – December 2019

CSC 216 Programming Concepts - Java *In-Person*

- Led lab sessions for two classes of 23 undergraduate students each

Education

North Carolina State University Raleigh, NC
Ph.D. in Computer Science *2025*

- Dissertation Title: `Gradient-Based Neuroplastic Adaptation for Concurrent Optimization of Neuro-Fuzzy Networks`
- Committee: James Lester, Munindar Singh, Wenbin Lu, and Min Chi (*Chair & Advisor*)
- Unconditional pass for proposal and defense of dissertation topic

North Carolina State University Raleigh, NC
M.Sc. in Computer Science *2022*

- Awarded the *Graduate Merit Award* (x3) by the College of Engineering in 2019, '21, and '22
- GPA: 3.83/4.00

The Pennsylvania State University Harrisburg, PA
B.Sc. in Computer Science *2019*

- Placed on the *Dean's List* (x4) in Fall 2016, Spring '17, Spring '18 and Spring '19
- Enrolled in the Capital College Honors Program from 2017-'18
- GPA: 3.66/4.00

Embry-Riddle Aeronautical University Daytona Beach, FL
Coursework in Engineering Physics *2015 - 2016*

- Awarded *Dean's Scholarship* by the Embry-Riddle Aeronautical University Scholarship Committee

Research Interests

- ARTIFICIAL INTELLIGENCE: Neuro-Symbolic AI, eXplainable AI, Online/Offline Reinforcement Learning
- UNCERTAINTY: Fuzzy Logic, Multi-Valued Logic, Approximate Reasoning, Rough Sets, Granular Computing

Research Mentoring

Ph.D. Students Mentored:

1.	Adittya Soukarjya Saha	NC State	2023-2024
2.	Rajesh Debnath	NC State	2023-2024
3.	Md Mirajul Islam	NC State	2023-2024
4.	Safaa Mohamed	NC State	2023-2024

M.Sc. Students Mentored:

1.	Gyuhun Jung	NC State	2023

Community, Service & Leadership

Program Committee Member 2025
The 28th European Conference on Artificial Intelligence (ECAI)

Program Committee Member 2025
The 7th Int'l Workshop on EXplainable, Trustworthy and Responsible AI and Multi-Agent Systems (EXTRAAMAS)

Peer Reviewer 2025
The 42nd International Conference on Machine Learning (ICML)

Peer Reviewer 2025
The 28th International Conference on Artificial Intelligence and Statistics (AISTATS)

Peer Reviewer 2025
The 13th International Conference on Learning Representations (ICLR)

Volunteer Student Coordinator October 2022 – 2024
NC State Computer Science Doctoral Recruiting *Raleigh, NC*

- Assembled and led volunteer teams of 28 currently enrolled Ph.D. students (total) to recruit new Ph.D. students

Peer Reviewer 2024 – 2025
The 38th & 39th Annual Conference on Neural Information Processing Systems (NeurIPS)

Peer Reviewer 2022 & 2024
ACM Conference on Human Factors in Computing Systems (CHI)

Program Committee Member of Main Track 2023 – 2025
The 13th, 14th, & 15th Symposium on Educational Advances in Artificial Intelligence (EAAI)

Volunteer May 29, 2023 - June 2, 2023
22nd International Conference on Autonomous Agents and Multiagent Systems *ExCeL London*

Exam Scribe October 12, 2021 - December 8, 2021
Disability Resource Office *Raleigh, NC*
Secretary August 2017 - May 2019
Association for Computing Machinery at Penn State Harrisburg *Harrisburg, PA*
C++ Competitive Programmer April 5, 2017
International Collegiate Programming Contest *Shippensburg University*

- Selected to represent Penn State Harrisburg at the ACM Mid-Atlantic Region Programming Competition

Award Funding

Quick Turn-Around Grant ($1,000) September 15, 2025
Gordon Ford College of Business *Bowling Green, KY*
SIGAI Student Travel Grant ($2,000) October 5, 2023
Intelligent Virtual Agents (IVA) 2023 Conference Travel Grant Program *Würzburg, Germany*
Student Travel Grant ($1,000) August 28, 2023
College of Engineering Enhancement Fee Travel Award *Würzburg, Germany*
Student Travel Grant ($1,000) April 1, 2023
College of Engineering at North Carolina State University *London, UK*
AAMAS Student Scholarship (£580) March 26, 2023
22nd International Conference on AAMAS Scholarship Chairs *London, UK*
Graduate Merit Award ($3,000) July 9, 2019
College of Engineering at North Carolina State University *Raleigh, NC*
Graduate Merit Award ($3,000) July 9, 2019
College of Engineering at North Carolina State University *Raleigh, NC*
Graduate Student Support Plan (∼ $48,912/yr.) August 16, 2019 - May 15, 2023
College of Engineering at North Carolina State University *Raleigh, NC*
Graduate Merit Award ($3,000) February 11, 2019
College of Engineering at North Carolina State University *Raleigh, NC*
Dean's Scholarship ($9,800) August 2015
Embry-Riddle Aeronautical University Scholarship Committee *Daytona Beach, FL*

Peer-Reviewed Publications in Academic Journals

1. Mark Abdelshiheed, Robert Moulder, **John Wesley Hostetter**, Tiffany Barnes, and Min Chi. (Invited Submission; Under Review) Reinforcing Deep Reinforcement Learning with Strategy Interventions to Bridge Metacognitive Knowledge Gap. *International Journal of Artificial Intelligence in Education (IJAIED)*

2. Mark Abdelshiheed, Robert Moulder, **John Wesley Hostetter**, Tiffany Barnes, and Min Chi. Example, nudge, or practice? Assessing metacognitive knowledge transfer of factual and procedural learners. *User Modeling and User-Adapted Interaction*, 34(5):1745–1775, 2024

Peer-Reviewed Publications in Conference Proceedings[1]

1. **John Wesley Hostetter**, Adittya Soukarjya Saha, Md Mirajul Islam, Tiffany Barnes, and Min Chi. Human-Readable Neuro-Fuzzy Networks from Frequent Yet Discernible Patterns in Reward-Based Environments. In *Proceedings of the 34th International Joint Conference on Artificial Intelligence, IJCAI*, 2025. Full Paper - Main Track, *Acceptance Rate of 19.3% (1,042/5,404)*

2. Md Mirajul Islam, Xi Yang, **John Wesley Hostetter**, Adittya Soukarjya Saha, and Min Chi. A Generalized Apprenticeship Learning Framework for Modeling Heterogeneous Student Pedagogical Strategies. In *Proceedings of the 17th International Conference on Educational Data Mining*. EDM, 2024. Full Paper - Presentation, *Acceptance Rate of 25.93% (21/81)*

3. **John Wesley Hostetter**, Mark Abdelshiheed, Tiffany Barnes, and Min Chi. A Self-Organizing Neuro-Fuzzy Q-Network: Systematic Design with Offline Hybrid Learning. In *Proceedings of the 22nd International Conference on Autonomous Agents and Multiagent Systems*. AAMAS, International Foundation for Autonomous Agents and Multiagent Systems, 2023. Full Paper - Oral Presentation, *Acceptance Rate of 23.3% (237/1,015 submissions)*

[1] EDM and AIED as well as FUZZ IEEE are premier conferences in Computer Science Education and Fuzzy Logic, respectively.

4. **John Wesley Hostetter**, Cristina Conati, Xi Yang, Mark Abdelshiheed, Tiffany Barnes, and Min Chi. XAI to Increase the Effectiveness of an Intelligent Pedagogical Agent. In *Proceedings of the 23rd ACM International Conference on Intelligent Virtual Agents*. IVA, Association for Computing Machinery, 2023. Full Paper - Oral Presentation **(Best Paper Finalist),** *Acceptance Rate of 28.0%*

5. **John Wesley Hostetter** and Min Chi. Latent Space Encoding for Interpretable Fuzzy Logic Rules in Continuous and Noisy High-Dimensional Spaces. In *2023 IEEE International Conference on Fuzzy Systems*. FUZZ, IEEE, 2023. Full Paper - Oral Presentation

6. **John Wesley Hostetter**, Mark Abdelshiheed, Tiffany Barnes, and Min Chi. Leveraging Fuzzy Logic Towards More Explainable Reinforcement Learning-Induced Pedagogical Policies on Intelligent Tutoring Systems. In *2023 IEEE International Conference on Fuzzy Systems*. FUZZ, IEEE, 2023. Full Paper - Oral Presentation

7. Mark Abdelshiheed, **John Wesley Hostetter**, Tiffany Barnes, and Min Chi. Leveraging Deep Reinforcement Learning for Metacognitive Interventions across Intelligent Tutoring Systems. In *Proceedings of the 24th International Conference on Artificial Intelligence in Education*. AIED, Springer International Publishing, 2023. Full Paper - Oral Presentation **(Best Paper Finalist),** *Acceptance Rate of 21.11% (53/251)*

8. Mark Abdelshiheed, **John Wesley Hostetter**, Tiffany Barnes, and Min Chi. Bridging Declarative, Procedural, and Conditional Metacognitive Knowledge Gap Using Deep Reinforcement Learning. In *45th Annual Conference Proceedings of the Cognitive Science Society*, 2023. Full Paper - Oral Presentation **(Winner of Travel Grant Award based on Paper Quality),** *Acceptance Rate of 17.0% (155/875)*

9. Mark Abdelshiheed, **John Wesley Hostetter**, Preya Shabrina, Tiffany Barnes, and Min Chi. The Power of Nudging: Exploring Three Interventions for Metacognitive Skills Instruction across Intelligent Tutoring Systems. In *44th Annual Conference Proceedings of the Cognitive Science Society*, volume 44, 2022. Full Paper - Oral Presentation **(Winner of Diversity & Inclusion Award),** *Acceptance Rate of 27.0% (205/762)*

10. Mark Abdelshiheed, **John Wesley Hostetter**, Xi Yang, Tiffany Barnes, and Min Chi. Mixing Backward-with Forward-Chaining for Metacognitive Skill Acquisition and Transfer. In *International Conference on Artificial Intelligence in Education*, pages 546–552. AIED, Springer, 2022. Oral Presentation, *Acceptance Rate of 20.0% (40/197)*

Published PyPI Packages (Sole Owner & Developer)

manim-timeline | `manim-slides, igraph` | *pypi.org/p/manim-timeline* **2024 - Present**

- A seamless and elegant timeline for rapid presentation of related literature

manim-beamer | `manim-slides` | *pypi.org/p/manim-beamer* **2024 - Present**

- Emulate LaTeX beamer in Python to animate technical and professional slides

regime | `igraph` | 754 LOC w/ 99% cov. | *pypi.org/p/regime* **2024 - Present**

- Lightweight MLOps; inspect, visualize, validate workflows & hyperparameters

rough-theory | `igraph` | 1.8k LOC w/ 85% cov. | *pypi.org/p/rough-theory* **2021 - Present**

- Leverage discernibility to identify core knowledge (e.g., cut provably irrelevant attributes)

fuzzy-theory | `PyTorch, igraph` | 3.6k LOC w/ 93% cov. | *pypi.org/p/fuzzy-theory* **2020 - Present**

- Transparent approximate reasoning via neuro-fuzzy networks, fuzzy sets & fuzzy logic operations

fuzzy-ml | `PyTorch, rpy2, skorch` | 3.3k LOC w/ 75% cov. | *pypi.org/p/fuzzy-ml* **2020 - Present**

- Fuzzy clustering, linguistic summaries and association analysis of temporal quantitative databases

Open-Source Projects (Sole Owner & Developer)

PolicyPrep | `PyTorch, d3rlpy` | 3.9k LOC | *github.com/johnHostetter/PolicyPrep* **2023-2024**

- Configurable MLOps for offline reinforcement learning in e-learning; saves ∼1-2 months annually

Fuzzy Conservative Q-Learning Demo | `PyTorch` | *zenodo.org/records/7668308* **2023**

- A self-organizing, transparent neuro-fuzzy network; published in AAMAS 2023

Neuro-Symbolic AI | `Numpy` | *github.com/johnHostetter/Soft-Computing* **2020-2022**

- Neuro-symbolic AIs (e.g., genetic fuzzy systems) and soft computing operations

and at least 4 more related to neuro-symbolic AI (e.g., GPFRL, GARIC, Kohonen, SaFIN)

Closed-Source Projects († Indicates Sole Owner & Developer)

PySoft† | `sb3, d3rlpy, wandb` | 3.5k LOC w/ 87% cov. | *hostetter-lab.github.io/PySoft* **2020-Present**

- Reinforcement & supervised learning of neuro-symbolic networks in PyTorch
- Supports `d3rlpy`, `stable-baselines3` (`sb3`), `skorch`, `rpy2`, `sympy`, `wandb`, etc. for rapid prototyping

HepiusApp | `C#, Xamarin` | *ronak1997.github.io/Hepius/* **2019**

- Built a mobile app to research smartphone use in healthcare decisions for Osteoporosis
- Supervised clinical trials led by Dr. Russell Kirkscey, Dr. Edward Fox, and Dr. Hien Nguyen
- **Transferred intellectual property to Penn State Research Foundation**
- Led to and featured in at least 2 publications:
  1. Russell Kirkscey. Development and patient user experience evaluation of an mhealth informational app for osteoporosis. *International Journal of Human–Computer Interaction*, 38(8):707–718, 2022
  2. Russell Kirkscey. mhealth apps for older adults: A method for development and user experience design evaluation. *Journal of Technical Writing and Communication*, 51(2):199–217, 2021

References

1. Min Chi (`mchi@ncsu.edu`, `919-515-7825`), Professor
2. James Lester (`lester@ncsu.edu`, `919-515-7534`), Goodnight Distinguished University Professor in Artificial Intelligence and Machine Learning & Director of the Center for Educational Informatics
3. Tiffany Barnes (`tmbarnes@ncsu.edu`, `919-515-5764`), Distinguished Professor
4. Travis Martin (`tmmarti5@ncsu.edu`, `919-559-0299`), AI Academy Instructor [Teaching Reference]