Zachary Laborde

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An award-winning PhD Research Scientist (Google PhD Nominee, Best Student Paper Award) blending 4 years of high-impact software engineering at IBM ($1M savings) with pioneering research in embodied AI. Expertise in training intelligent agents in advanced robotics simulations (Unity, Nvidia Isaac Sim) using modern AI frameworks (PyTorch, JAX).

EDUCATION

Indiana University Bloomington **May 2026**
PhD in Cognitive Science & Neuroscience
Research Focus in NeuroAI, Embodied AI, & Reinforcement Learning

Xavier University of Louisiana **May 2017**
BS in Psychology, Minor in Computer Science

SKILLS

AI/ML Frameworks: PyTorch, Lightning, Stable Baselines3, RLLTE, TensorFlow, Scikit-Learn, transformers, Hugging Face, JAX
Simulation Software: Unity, Unity ML Agents, Gymnasium, Petting Zoo, MuJoCo, Nvidia Isaac Sim, Nvidia Isaac Lab, SuperSuit
Data Science & Ops: Hadoop, Spark, MongoDB, BigQuery, Cassandra, Git, Kubernetes, NumPy, SciPy, Matplotlib, Jupyter, HPC
Research Techniques: Feature Visualization, Saliency/Attention Maps, Hyperparameter Tuning, Research Methods, Data Analysis
Languages: Python, JavaScript, R, Shell, SQL, C#, C++, Mathematica, Java, MATLAB, Groovy, Ruby, Go, HTML, CSS

RELEVANT WORK EXPERIENCE

IBM Software Engineer **Jul 2017 – Aug 2021**

- Automated international team of SREs across 3 continents in 5 countries, saving IBM approximately $1,000,000/year
- Automated operations event analytics analysis & prediction with machine learning, implementing & developing APIs
- Developed two internationally used mobile apps for both Android & iOS used across 7 countries
- Invented design for autonomous umbrella drone to keep users dry without need for interaction *(Published to IP.com (2019))*

RESEARCH EXPERIENCE

Indiana University Bloomington Dr. Justin N. Wood & Dr. Eduardo Izquierdo **Aug 2021 – Present**

- Created Python library to benchmark AI agent learning performance against real animals in Unity VR environments across 8 experiments, training neural networks (ViT, CNN, LSTM, MLP, etc) using PPO & intrinsic rewards (ICM, RND, RIDE, etc) *(Publication in progress; Presented at Cognitive Development Society (2024); code publicly available)*
- Evolved millions of sensorimotor configurations in simulated agents, applying a genetic algorithm on Continuous Time RNN (CTRNN) controllers, achieving neural networks that were 67% the size & 30% more performant *(code publicly available)*
- Discovered dynamic multi-control system for cell lineages with application in synthetic biology & regenerative medicine *(Published to International Society for Artificial Life (2023) ; online application available)*
- Modeled development of C. elegans connectome with average connection lengths 60% more accurate than existing models *(Published to International Society for Artificial Life (2023); Presented at Society for Neuroscience (2022); code available)*
- Implemented level set algorithm for high-dimensional manifolds, reducing complexity & resource usage by 90%

Xavier University of Louisiana Dr. Jeremy D. Cohen **Aug 2014 – Jul 2017**

- Developed software to bisect brain region in MRI scans, automates 3-hour process down to seconds, >100x speed improvement *(Presented at Cognitive Neuroscience Society (2017) ; code publicly available)*
- Designed & administered 20 person study on nostalgia & time perception, bootstrapping results & applied ANOVA on data *(Published in XULAneXUS (2016); Presented at Charles Gramlich Research Symposium (2015))*

Dartmouth College Dr. Todd F. Heatherton **Summer 2016**

- Analyzed GBs of 4D fMRI data with R, SPM, & FSL correlating brain activity & attention using tests made in MATLAB *(Presented at Leadership Alliance National Symposium (2016))*

RELEVANT OPEN-SOURCE CONTRIBUTIONS

RLE-Foundation/rllte: Fixed a bug for calculating inverse model loss in multi-dimensional action spaces
Unity-Technologies/ml-agents: Submitted PR to add compatibility with Gymnasium library, replacing deprecated OpenAI Gym

HONORS & AWARDS

Google: PhD Fellowship Nominee (2024)
International Society for Artificial Life: Best Student Paper Award (2024)
Indiana University Bloomington: Rebec Fellow (2022 & 2024)
IBM: Manager's Choice Award (Q1 2018 & Q1 2019)
IBM Developer SLAM: People's Choice Award (2018)
Xavier-Dillard Coding Competition: 1st Place (2017)
Novice National Intercollegiate Forensics Tournament: National Semifinalist in Impromptu Speaking (2013)
American Forensics Association National Tournament: National Competitor in Extemporaneous Speaking (2013)