

Education

Indiana University Bloomington

May 2026

PhD in Cognitive Science & Neuroscience

Research Focus in NeuroAI, Embodied AI, and Reinforcement Learning

Xavier University of Louisiana

May 2017

BS in Psychology, Minor in Computer Science

Publications

Laborde, Z., & Izquierdo, E. J. (2023, July). Spatial Embedding of Edges in a Synaptic Generative Model of *C. elegans*. In *ALIFE 2023: Ghost in the Machine: Proceedings of the 2023 Artificial Life Conference*. https://doi.org/10.1162/isal_a_00611

Severino, G. J., **Laborde, Z.**, & Barwich, A. S. (2023, July). The Degeneracy of Control Architectures in Cell Lineages: Implications for Tissue Homeostasis. In *ALIFE 2023: Ghost in the Machine: Proceedings of the 2023 Artificial Life Conference*. https://doi.org/10.1162/isal_a_00608

Laborde, Z., Toler, W., Velhal, K., Farag, T., & Chakra, A. (2019). Method and System for Implementing a Holistic Umbrella Drone. *IP.com*. <https://priorart.ip.com/IPCOM/000257353>

Laborde, Z., & Cohen, J. (2016). Nostalgia and the Perception of Time. *XULAnEXUS*, 14(1). <https://digitalcommons.xula.edu/xulanexus/vol14/iss1/1>

Conference Presentations

Wood, S. M. W., Garimella, M., Desai, B., **Laborde Z.**, & Wood, J. N. (2024, March). *Comparing Newborn Animals and Newborn Machines: A Newborn Embodied Turing Test for the Development of Object Perception*. [Poster presentation]. Cognitive Development Society, Pasadena, CA, USA.

Laborde, Z., & Izquierdo, E. J. (2023, July). *Spatial Embedding of Edges in a Synaptic Generative Model of C. elegans*. [Powerpoint presentation]. ALIFE 2023: Ghost in the Machine, Sapporo, Japan.

Laborde, Z., & Izquierdo, E. J. (2022, November). *Spatial Embedding of Edges in Synaptic Generative Model of C. elegans* [Poster presentation]. Neuroscience, San Diego, CA, USA.

Laborde, Z. & Izquierdo, E. J. (2022, October). *Spatial Embedding of Edges in Synaptic Generative Model of C. elegans* [Poster presentation]. Annual Psychology Graduate Research Symposium & Reception, Bloomington, IN, USA.

Laborde, Z., Stephenson, D., Reiss, A., Beaton, E., & Cohen, J. (2017, March). *Anterior-Posterior Insular Cortex Bisection Plugin for Mango* [Poster presentation]. Cognitive Neuroscience Society, San Francisco, CA, USA.

Laborde, Z., Heatherton, T., & Lopez, R. (2016, August). *You've Got a Friend in Me: Effects of People-based Cues on Amygdala, Orbitofrontal Cortex, and Dorsomedial Prefrontal Cortex* [Poster presentation]. ASURE Poster Night, Hanover, NH, USA.

Laborde, Z., Heatherton, T., & Lopez, R. (2016, July). *Learning to Lose Focus: Relationships Between Reward-Learning, Multitasking, and Distractibility* [Powerpoint presentation]. Leadership Alliance National Symposium, Stamford, CT, USA.

Laborde, Z. & Cohen, J. (2014, November). *Nostalgia and Time Dilation* [Powerpoint presentation]. Charles A. Gramlich Psychology Research Symposium, New Orleans, LA, US

Research Experience

Indiana University Bloomington | Dr. Justin Wood & Dr. Eduardo Izquierdo | Aug. 2021 - Present

- Created Python library for comparing AI agent learning performance to real animals by duplicating their environmental conditions in VR (<https://github.com/buildingamind/NewbornEmbodiedTuringTest>)
- Pioneered evolution of sensorimotor configurations in simulated agents utilizing Continuous Time RNN (CTRNN) controllers achieving neural networks that were simultaneously smaller and more performant
- Modeled development of *C. elegans* connectome, improving accuracy versus existing models and new perspectives on structure
- Discovered bio-realistic dynamic control system for cell lineages with applications in synthetic biology and regenerative medicine
- Developed app for dynamical analysis of cell differentiation with multi-control mechanism (nanohub.org/resources/dynsysregen)
- Implemented level set algorithm for high-dimensional manifolds, reducing computational complexity and resource usage by 90%

Xavier University of Louisiana | Dr. Jeremy D. Cohen | Aug. 2014 - Jul. 2017

- Designed, administered, and published a 20 person research study on nostalgia and the perception of time
- Developed several pieces of software, including one automating a 2-4 hour manual process

University of New Orleans | Dr. Jeremy D. Cohen & Dr. Elliot Beaton | Aug. 2015 - Dec. 2016

- Taught three members how to accurately trace the Insula using the Multi-image Analysis GUI (Mango) MRI program
- Created several shell scripts for transforming tensor neuroimaging data using Advanced Normalization Tools (ANTs)

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

- Compiled and analyzed gigabytes of 4-dimensional fMRI data using R, SPM, and FSL for correlations between the vmPFC, the reward network, and attention scores from tests developed in MATLAB

Work Experience

IBM | Software Engineer | Jul. 2017 – Aug 2021

Netcool Operations Insight - Artificial Intelligence Operations

- Developed features to automate event analytics analysis and prediction for operation engineers using machine learning

IBM Cloud Event Management

- Developed two internationally-used mobile apps for both Android and iOS

IBM Cloud App Management

- Created front-end visualizations of topological data and analytics

IBM Hybrid Cloud

- Automated entire team, saving IBM approximately \$1,000,000/year
- Responded to high severity alerts related to several IBM cloud applications

Xavier University of Louisiana | Supplemental Instruction Leader | Jan. 2016 - Dec. 2016

Psychology Research Methods Spring 2016, Fall 2016

- Co-founded program with Professor Kate Eskine
- Arranged interactive sessions to help students learn research methods

Skills & Training

Coursework: Computational Modeling of Evolutionary and Adaptive Systems, Neural Engineering, Computational Bioengineering, Theories of Learning and Memory, Machine Learning, Computer Architecture, Network Science, Dynamical Systems Theory, Linear Algebra, Discrete Mathematics

Languages: Python, JavaScript (Node, React, Angular), R, C++, C#, Java, Matlab, Groovy, Mathematica, Ruby

Applications: Jupyter Notebooks, Advanced Normalization Tools, SPM, FSL, ITK-SNAP, Multi-Image Analysis GUI (Mango)

Software: PyTorch, TensorFlow, OpenAI Lab, NumPy, SciPy, Matplotlib, NetworkX, Kubernetes, Docker, Watson SDK, Jenkins, Hadoop, Spark, Git, LaTeX, Linux, Bash, BIOS

Team Management: Agile, Scrum, Design Thinking

Leadership Positions

IBM | Agile Workspace Super Champion | Dec 2018 - Present

IBM New Hire Network | Treasurer | Aug. 2017 - Aug. 2018

Speech & Debate Team - Xavier University of Louisiana | President | May 2016 - May 2017

Speech & Debate Team - Xavier University of Louisiana | Vice President | May 2015 - May 2016

Speech & Debate Team - Xavier University of Louisiana | Treasurer | May 2014 - May 2015

Speech & Debate Team - Louisiana State University | Treasurer | Aug. 2012 - May 2013

Honors & Awards

Google PhD Fellowship Nominee, Google, 2024

Best Student Paper Award, International Society for Artificial Life, 2024

Rebec Fellow, Indiana University Bloomington, 2024

Rebec Fellow, Indiana University Bloomington, 2022

Security and Privacy by Design Foundations Badge, IBM, 2019

IBM Cloud Private - Continuous Integration/Continuous Delivery Badge, IBM, 2019

Jumpstart Scholar, IBM, 2019

Manager's Choice Award, IBM, Q1 2018, Q1 2019

People's Choice Award, IBM Developer SLAM, 2018

IBM Developer Jumpstart - Explorer Badge, IBM, 2018

IBM Developer Jumpstart - Practitioner Badge, IBM, 2018

Deep Learning Badge, IBM, 2018

Docker Essentials with Watson Conversation Badge, IBM, 2017

IBM Cloud Essentials Badge, IBM, 2017

Enterprise Design Thinking Practitioner Badge, IBM, 2017

Who's Who Among Students in American Universities and Colleges, 2017

1st Place, Xavier-Dillard Coding Competition, 2017

Dean's List, Xavier University of Louisiana, Fall 2015, Spring 2016, Spring 2017

National Semifinalist in Impromptu Speaking, Forensics Novice Nationals, 2013

National Semifinalist in Impromptu Sales, Forensics Novice Nationals, 2013

National Competitor in Extemporaneous Speaking, American Forensics Association's National Individual Event Tournament, 2013