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## Education

**Indiana University Bloomington***Ph.D. Student in Cognitive Science & Neuroscience*

Bloomington, IN

**Aug. 2021 - Present****Xavier University of Louisiana***B.S. in Psychology*

New Orleans, LA

**Aug. 2013 - May 2017**

## 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](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](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.,** Heatheron, 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.,** Heatheron, 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

*Research Assistant*

Bloomington, IN

**Aug. 2021 - Present**

Dr. Justin Wood & Dr. Eduardo Izquierdo

- Cocreated a Python library for comparing the learning performance of artificial agents with real animals by duplicating their environmental conditions in virtual reality (<https://github.com/buildingamind/NewbornEmbodiedTuringTest>)
- Pioneered the evolution of optimal sensorimotor configurations in simulated agents utilizing Continuous Time Recurrent Neural Network (CTRNN) controllers achieving neural networks that were simultaneously smaller and more performant
- Modeled development of a *C. elegans* connectome leading to improved accuracy versus existing models and new perspectives on its structure
- Discovered a new biologically-realistic dynamic control system for cellular lineages with potential applications in synthetic biology and regenerative medicine
- Developed and launched an online application for the dynamical analysis of cellular differentiation in multi-compartment systems integrating multiple control mechanisms (<https://nanohub.org/resources/dynsysregen>)
- Conceived and implemented a novel level set approximation algorithm for high-dimensional manifolds significantly reducing computational complexity and resource usage by 90%

## Xavier University of Louisiana

*Research Assistant*

New Orleans, LA

**Aug. 2014 - Jul. 2017**

Dr. Jeremy D. Cohen

- 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

*Research Assistant*

New Orleans, LA

**Aug. 2015 - Dec. 2016**

Dr. Jeremy D. Cohen & Dr. Elliot Beaton

- 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

*Summer Undergraduate Laboratory Internship - Research Assistant*

Hanover, NH

**Summer 2016**

Dr. Todd F. Heatherton

- 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

*Full Stack Developer*

Research Triangle Park, NC

**Apr. 2020 - Present**

Netcool Operations Insight - Artificial Intelligence Operations

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

*Full Stack Developer*

**Nov. 2018 - Apr. 2020**

IBM Cloud Event Management

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

*Front End Developer*

**Apr. 2018 - Nov. 2018**

IBM Cloud App Management

- Created front-end visualizations of topological data and analytics

*Site Reliability Engineer*

**Jul. 2017 - Apr. 2018**

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*

Psychology Research Methods Spring 2016, Fall 2016

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

New Orleans, LA  
**Jan. 2016 - Dec. 2016**

## **Tastee Donuts**

Metairie, LA

*Assistant Manager*

*Cashier / Cook / Fryer*

**Jun. 2015 - Feb. 2016**  
**Jun. 2010 - Aug. 2012, Jun. 2013 - Jun. 2015**

## **Louisiana State University**

*Archivist*

Baton Rouge, LA  
**Aug. 2012 - Dec. 2012**

## **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*

Research Triangle Park, NC  
**Dec 2018 - Present**

### **IBM New Hire Network**

*Treasurer*

Research Triangle Park, NC  
**Aug. 2017 - Aug. 2018**

### **Speech & Debate Team - Xavier University of Louisiana**

*President*

*Vice President*

*Treasurer*

New Orleans, LA  
**May 2016 - May 2017**  
**May 2015 - May 2016**  
**Aug. 2014 - May 2015**

### **Speech & Debate Team - Louisiana State University**

*Treasurer*

Baton Rouge, LA  
**Aug. 2012 - May 2013**

## **Honors & Awards**

*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

## **Volunteer Experience**

**St. Augustine High School Debate Coach**

70+ hours

New Orleans, LA

**Aug. 2015 - May 2017**