

# Emma Susi

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## EDUCATION

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**Florida Atlantic University**, Boca Raton, FL  
Bachelor of Science in Neuroscience and Behavior  
GPA: 3.77 / 4.0 (*magna cum laude*)

*Expected December 2023*

**Kansai Gaidai University**, Osaka-Shi, Japan  
Asian Studies Program

*December 2022*

## RESEARCH EXPERIENCE

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### **Machine Perception and Cognitive Robotics Lab (MPCR)**

Undergraduate Student Researcher

Advisor: William Hahn, Ph.D.

Project: Low-cost Assistive Communication Brain-Computer Interface

Boca Raton, Florida

March 2023 - Present

- At the intersection of neuroscience and technology, employed EEG and EMG recording systems, biofeedback devices, and Python programming (SciPy, NumPy, Matplotlib, and Pyaudio) to develop innovative solutions for complex challenges in conjunction with machine learning algorithms to design, develop, and optimize novel neuromuscular interfaces and communication devices
- Initiated a project to develop a low-cost brain-computer interface for individuals affected by ALS or stroke, utilizing biofeedback, Python for visualization and analysis of EMG data, and an HTML-based interface to display welfare-related questions and facilitate patient communication
- Developed a Python-based program to decode biosignal data streams by identifying threshold-passing spikes in motor neuron activity, translating these spikes by differentiation based on impulse duration above the threshold
- Awarded the FAU Wave grant to fund the further development of an EEG-based assistive communication device

### **Neuroscience Institute at FAU Wilkes Honors College**

Undergraduate Student Researcher

Advisor: Robert Stackman, Ph.D.

Jupiter, Florida

August 2021 - Present

- Investigated head direction cells' role in spatial navigation and dopaminergic influences on memory consolidation through execution of behavioral tasks using the Morris Water Maze, tissue extraction and processing, as well as mounting and staining of brain slices for neuronal activity analysis via fluorescent histology
- Used laboratory techniques, including mouse handling (scruffing, injections, and euthanasia), ensuring adherence to ethical and safety protocols

Project: DeepEthogram Machine Learning Behavior Analysis

- Led the effort to introduce and train the "Deep Ethogram" machine learning algorithm for the analysis of mouse behavior patterns to integrate artificial intelligence technologies into the lab to enhance research capabilities
- Conducted evaluations by comparing the performance of the machine learning algorithm against traditional manual scoring methods for tracking mouse behavior
- Documented methodologies and results to contribute to the neuroscience community's understanding of AI applications in behavioral research

**Barb Schmidt Fellowship**  
Fellow

Boca Raton, Florida  
July 2021 - June 2022

- Enrolled in Barb Schmidt Fellowship for 6 university credits, participating in bi-weekly workshops to develop the skills and knowledge needed to initiate, execute, and sustain a social movement
- Co-founded a student-led organization focusing on providing students impacted by income inequality with creative outlets and cultural experiences
- Presented organization to potential donors and awarded a \$1000 grant to fund the organization's first event

**Veterans Affairs Hospital**  
Research Intern and Hospital Volunteer  
Advisor: Joan Clifford, Ph.D.  
Project: Internal Analysis of VA Vaccination Response

Bedford, Massachusetts  
July 2021 - August 2021

- Conducted internal analysis of VA hospitals to ensure efficient vaccine response to prevent hospital overcrowding
- Systematically organized and coded data, information, and procedures into spreadsheets with the aim of developing a versatile toolkit, optimizing vaccine response strategies for states and communities with varying resource availability
- Program successfully contributed to VA vaccination rates by ensuring a safe and efficient vaccine response system through comprehensive data collection and analysis on diverse global COVID-19 vaccine response systems to identify best practices

**INSTRUCTIONAL ACTIVITY AND MENTORING**

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**MarcoLearning**  
Student Grader

Remote  
February 2023 - Sep 2023

- Assisted teachers by efficiently grading academic assignments, contributing to students' educational success
- Demonstrated subject matter expertise and attention to detail, collaborating effectively with the Marco Learning team to ensure accurate, fair evaluations and timely feedback
- Maintained a solid commitment to professional development, staying current with pedagogical best practices and enhancing grading techniques to better serve students and educators

**KidsPass**  
Tutor

Remote  
March 2023 - Sep 2023

- Tutored students unable to attend in-person sessions, creating personalized learning plans and assignments to cater to individual student needs and promote academic growth
- Conducted engaging one-on-one sessions with students, adapting teaching strategies to optimize learning outcomes and foster a supportive educational environment
- Demonstrated strong organizational skills, ensuring a comprehensive and tailored approach to instruction and student progress assessment

**FAU High School Peer Mentoring Program**  
Mentor

Boca Raton, Florida  
May 2022 - May 2023

- Enrolled in a bi-weekly 3-credit peer mentoring course to develop leadership, teaching, and communication abilities to ensure an effective and comfortable environment for students
- Coordinated weekly sessions with a group of five dual-enrolled sophomore students, acting as an advisor and mentor to help ease their transition from high school to university, socially and academically
- Created and conducted activities and lessons tailored to the student's needs, such as lessons regarding learning styles, goal-setting, and stress management, as well as Socratic seminars pertaining to reasons behind procrastination

## **INVOLVEMENT**

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<b>Neuroscience Club - Member</b>	April 2022 - Present
<b>Kansai Gaidai Outdoors Club - Member</b>	August 2022 - December 2022
<b>Arts4Hearts - Co-Founder</b>	August 2021 - June 2022
<b>Student-Athlete Leadership Team (SALT) - Board Member</b>	December 2021 - May 2022
<b>Student Government - Senior Class Representative</b>	August 2021 - May 2022
<b>FAU High School Varsity Soccer - Athlete</b>	October 2019 - March 2020
<b>American Medical Student Association - Member</b>	August 2019 - May 2022
<b>FAU High School Varsity Track and Field - Athlete</b>	November 2018 - May 2022

## **SKILLS**

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### **Languages**

English, Spanish - Fluent

Japanese - N5 Proficiency

### **Programming**

- Python (pandas, scipy, matplotlib, numpy, tkinter, object-oriented programming)
- Basic HTML
- Deep Ethogram Machine Learning Behavior Analysis

### **Laboratory Training**

Environmental Health and Safety Training (EH&S) - Laboratory Safety, Fire Safety and Prevention, Fire Extinguisher Training, Hazard Communication, Hazardous Material Handling and Storage, Hazardous Waste Generator, Bloodborne Pathogens Training, Biosafety Hazardous Waste Handling and Disposal

CITI - Mandatory General Training for All Animal Users, Reducing Pain and Distress in Laboratory Mice and Rats, Responsible Conduct of Research, Working with Mice in Research

IACUC - Rat/Mouse and Ethics Certification

### **Additional Wet Lab Skills**

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|--|--------------------------------|
| - Clearing and Staining Tissue                         | - Mounting Brain Slices        |
| - Morris Water Maze                                    | - Brain Extractions            |
| - Novel Object Recognition                             | - Mouse Euthanasia             |
| - Behavior Analysis and Scoring                        | - Scruffing and Injecting Mice |
| - Electromyography and Electroencephalography Analysis | - Fluorescent Histology        |
|  | - Confocal                     |

## **AWARDS AND HONORS**

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President's List - 2020

Dean's List - 2020, 2022, 2023

FAU Wave Competition Grant Recipient

FAU Education Abroad Scholarship

Spirit of the Atlantic Scholarship

FAU Foundation Scholarship

National Hispanic Recognition Program

FHSAA Track and Field District Champion - 2019, 2022

FHSAA Track and Field Regional Champion - 2022