

# Bryan Jose Medina

## Curriculum Vitae

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### Education

2016-present **B.S. Computer Science, Minor in Mathematics, Minor in Cognitive Sciences,**  
*University of Central Florida, Orlando, FL.*

### Technical Skills

Programming PYTHON, JAVA, C++, C, R, MATLAB, JAVASCRIPT, L<sup>A</sup>T<sub>E</sub>X, BASH  
Software EMACS, MS WORD, MS POWERPOINT, R STUDIO  
Libraries and Frameworks TENSORFLOW, KERAS, PYTORCH, PYGAME, PROCESSING, NUMPY, SCIPY, MATPLOTLIB

### Experience

2020-present **Visiting Student, *Department of Brain and Cognitive Sciences,***  
*Massachusetts Institute Of Technology*

2020 **MSRP-BIOx Research Intern, *Center For Brains, Minds, and Machines,***  
*Massachusetts Institute Of Technology*

Advisor: Dr. Josh McDermott

Investigating viability of deep neural networks as a model for human pitch perception

Developing code in TENSORFLOW to perform numerous auditory tasks and layer-wise tests to compare model performance to humans

Funded by the Center for Brains, Minds, and Machines, the National Science Foundation, and the Ronald E. McNair Scholars Program

2020 **Researcher, *Senior Design Capstone Project,*** University of Central Florida

Comparing different machine learning models (probabilistic, recurrent neural networks, transformers) on vulnerability detection using only Git commit messages using TENSORFLOW and KERAS

Writing code to scrape internet for Git commit information

2019-2020 **Independent Researcher,** University of Central Florida

Developed generative models with gated recurrent networks in order to optimize sound synthesis

Compared gated recurrent networks to long-short term memory units on music synthesis

2019-2020 **Undergraduate Research Assistant, *Laboratory for Autonomy-Brain Exchange (LabX),*** University of Central Florida

Advisor: Dr. Ben D. Sawyer

Experimented with Generative Adversarial Networks and how they function with images, audio, and neural data like Electroencephalograms

- Assisted in editing and developing code for a driving simulation study
- 2019 **Undergraduate Program in Neural Computation Research Intern, *Center for the Neural Basis of Cognition***, Carnegie Mellon University  
Advisor: Dr. Robert E. Kass  
Used statistical analyses in Python, Matlab, and R to establish feed-forward functional relationships between six visual processing regions in mice  
Developed code as foundation for future exploratory research  
Funding by the National Institute for Health
- 2018-2019 **Undergraduate Research Assistant, *Center for Research in Computer Vision***, University of Central Florida  
Advisor: Dr. Mubarak Shah  
Learned how to use and develop code with KERAS  
Developed convolutional neural networks to recognize actions in video files
- 2017 **Undergraduate Research Assistant, *Hu-Lab***, University of Central Florida  
Advisor: Dr. Haiyan Hu  
Researched graph theory models to analyze protein signaling pathways involved with Cancer  
Implemented solution to Prize Collecting Steiner Tree Problem in Java

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## Awards and Honors

- 2020 ***Hispanic Heritage Scholarship Fund of Metro Orlando Scholar***
- 2020 ***Hispanic Scholarship Fund Scholar***
- 2020 **McNair Summer Research Institute Scholarship**
- 2020 **Massachusetts Institute of Technology Summer Research Fellow (NSF Funded)**
- 2019 **Ronald E. McNair Scholar**
- 2019 **Carnegie Mellon University Summer Research Fellow (NIH Funded)**
- 2017 **President's Honor Roll (x4)**
- 2017 **Dean's List (x4)**
- 2016 ***Bright Futures Academic Scholar***

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## Abstracts, Conferences, and Presentations

- ARO 2021** Medina, B. J., Saddler, M. R., McDermott, J. H., (2021, February). *Pitch Representations Emerge in Artificial Neural Networks Optimized for Everyday Auditory Tasks*. Abstract Accepted.
- CECIIS-2020**. Medina, B. J., Saddler, M. R., McDermott, J. H., (2020, October). *Investigating artificial neural networks optimized for ecological auditory tasks as a normative model of pitch perception*. Abstract accepted. Oral presentation.
- SACNAS**. Medina, B. J., Saddler, M. R., McDermott, J. H., (2020, October). *Investigating artificial neural networks optimized for ecological auditory tasks as a normative model of pitch perception*. Abstract accepted. Poster presentation.
- Baylor University McNair Conference**. Medina, B. J., Saddler, M. R., McDermott, J. H., (2020, October). *Investigating artificial neural networks optimized for ecological auditory tasks as a normative model of pitch perception*. Abstract accepted. Poster presentation.

**MSRPx BIO Presentation.** Medina, B. J., Saddler, M. R., McDermott, J. H., (2020, August). *Investigating artificial neural networks optimized for ecological auditory tasks as a normative model of pitch perception*. Oral presentation.

**UCLA McNair Conference.** Medina, B. J., Saddler, M. R., McDermott, J. H., (2020, July). *Investigating artificial neural networks optimized for ecological auditory tasks as a normative model of pitch perception*. Abstract accepted. Poster presentation.

**Vision Sciences Society Annual Meeting.** Hernandez, C. I., Rahill, K., Pham, M., Manriquez, L., Louis, P., Figueroa, A., **Medina, B. J.**, Wolfe, B., Sawyer, B. D., (2020, May). *Prevalence effects are not driving hazard detection on the road*. Abstract accepted. St. Pete Beach, FL. Did not attend due to COVID-19 (Coronavirus) pandemic.

**Showcase of Undergraduate Research Excellence.** Hernandez, C. I., Rahill, K., Pham, M., Manriquez, L., Louis, P., Figueroa, A., **Medina, B. J.**, Wolfe, B., Sawyer, B. D., (2020, April). *Prevalence effects are not driving hazard detection on the road*. Abstract accepted to Conference at the University of Central Florida, canceled due to COVID-19 (Coronavirus) pandemic

**Center for the Neural Basis of Cognition's Summer Undergraduate Poster Session.** **Medina, B. J.**, Olanrire, T., Siegle, J., Kass, R. E., (2019, August). *Response Latencies Across Six Visual Areas in the Mouse*. Presented research conducted with Dr. Robert E. Kass and Tolani Olanrire, Ph.D. student in Machine Learning, at Carnegie Mellon University

## Leadership, Membership and Outreach

2020-present **Graduate Prep Advisor, Academic Advancement Programs**,  
University of Central Florida

Supervisor: Colleen Smith

Assists students in graduate application process

Help with workshops on personal statements, fellowship writing, and the like

2020 **Attendee, Virtual Brains, Minds, and Machines Summer Course**,  
Center for Brains, Minds, and Machines

Coordinators: Dr. Tomaso Poggio, Dr. Gabriel Kreiman, Dr. Boris Katz

Attended workshops and poster presentations by graduate students and faculty on Computational Neuroscience, Artificial Intelligence, Philosophy, etc.

2020-present **Vice-President, SACNAS**, University of Central Florida

Advisor: Michael Aldarondo-Jeffries

Planning outreach activities with club Outreach Coordinator

Working with advertising chair to promote club on social media

2020-present **Co-Founder, Vice-President, Cognitive Sciences Club**, University of Central Florida

Advisor: Dr. Luis Favela

Organizing workshops for techniques in Cognitive Sciences research

Inviting professors to give talks on their research in the field

Reaching out and advertising club to students around campus

2020 **Journal Club Attendee, UCF NLP Group**, University of Central Florida

Advisor: Dr. Fei Liu

Accepted to attend biweekly meetings on various topics in natural language processing, such as multi-document summarization, natural language generation, and natural language understanding

Learning `PYTORCH` with the help of graduate students and Dr. Fei Liu

- 2020 **Attendee, *Quantitative Methods Workshop***, Massachusetts Institute Of Technology  
Advisor: Dr. Mandana Sassanfar

Attended workshops on spike train analysis, machine learning, systems neuroscience, cognitive science, and genomics

Networked with professors, post-docs, graduate students and research assistants.

Assisted other attendees with `MATLAB` questions

- 2018-2019 **STEM Ambassador *Initiatives in STEM***, University of Central Florida

Assisted in spreading awareness of STEM career paths around UCF and community

Gave talks around campus and local elementary schools

Volunteered in diversity outreach events

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## Teaching

- 2021 **Teaching Assistant, *Quantitative Methods Workshop***,  
Massachusetts Institute Of Technology

Advisor: Dr. Mandana Sassanfar

Offered advice to attendees on summer research opportunities and how to improve programming skills

Assisted attendees with `MATLAB` assignments and neuroscience questions

- 2020 **Tutorial, *UCF NLP***, University of Central Florida

Gave the lab a presentation on recurrent neural networks, long short term memory units, gated rectified units, and transformers

- 2019 **Python Lecturer, *LabX***, University of Central Florida

Presented to *LabX* lab members the basics of python programming, such as variables, functions, conditional statements, loops, and the like

Demonstrated and walked through pre-constructed examples made before presentations

- 2019-2020 **Undergraduate *EXCEL Tutor***, University of Central Florida

Tutored students in UCF's *EXCEL* program on various topics in Mathematics, Physics, and Computer Science

Mentored students on future opportunities to explore and how to study for current and future courses

- 2017 **Teaching Assistant and Lecturer, *Summer Institute @ UCF***,  
University of Central Florida

Lectured video game development to various students in Orange, Osceola and Seminole county

Created various assignments and examples for students to learn from and use as reference material

Graded assignments from students in a timely manner.

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## Invited Podcasts, Talks, and Workshops

- 2020 **Graduate School Preparation Podcast, *Elements of an Application for Funding***, University of Central Florida  
 Discussed experiences with the fellowship application process  
 Talked about experiences with research, fellowship applications, school, and family life during global pandemic
- 2020 **Undergraduate Research and Transfer Process Panel**, Valencia College  
 Discussed tips on how to succeed in a summer research setting as well as on admissions process
- 2019 **STEM Seminar Student Panel**, University of Central Florida  
 Discussed techniques, tips and tricks on how to succeed as an undergraduate in a STEM field
- 2018 **Mathematics Workshop**, Hialeah Gardens High School  
 Presented and lectured students on topics in Calculus for AP Exam Preparation.  
 Demonstrated to students the career possibilities available to them upon studying mathematics
- 2018 **Lecture on Computer Science and Engineering**, Orange County Preparatory Academy  
 Discussed to elementary school students the importance of diversity in STEM fields and careers  
 Explained to students concepts of Python program and showed students how to construct a simple game with the *PyGame* Python library

## Volunteering

- 2019, 2020 **Volunteer, *SECME Regional Competition***, University of Central Florida  
 Helped students setup and present their SECME competition entries  
 Discussed competition entries with individual groups
- 2019, 2020 **Judge, *SECME Codecraft Computer Programming Competition***, University of Central Florida  
 Judged competitions entries from elementary school and middle school students.  
 Provided feedback on their project submissions and how they could improve as programmers
- 2020 **GIS Day Voluneer**, University of Central Florida  
 Helped set up event and guide students to designated work stations
- 2016 **Teacher, *Hour of Code***, University of Central Florida  
 Taught basic programming concepts to elementary school students in a hands-on environment

## Certification

- 2020 ***CITI Program, Social / Behavioral Research Investigators and Key Personnel***

## Relevant Coursework

Computer Science + Statistics Courses    Theory of Computation, Data Structures, Object Oriented Programming, Algorithms, Robot Vision, Machine Learning\*, Advanced Artificial Intelligence\*, Senior Design I and II\*\*, Statistical Theory I, Statistical Foundations for Data Science and Artificial Intelligence, Computer Understanding of Natural Language\* \*\*

Mathematics Courses Calculus I-III, Ordinary Differential Equations, Linear Algebra, Probability, Random Processes and Applications, Introduction to Topology\*\*

Other Courses Chemistry I, Chemistry II, General Psychology, Biological Principles, Numerical Computing, Language and Culture, Philosophy of Mind, Sensation and Perception\*\*, Minds and Machines: Philosophy of Cognitive Science\*\*

\* - *Graduate Coursework*

\*\* - *In Progress*

\*\*\* - *To be completed*

## Languages

English Fluent

Spanish Fluent

Portuguese Basic