

# Resume

## Eric J. Leonardis, MS, PhD (ABD)

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### SKILLS

**Programming Languages:** Matlab, Python, Arduino, Processing, C

**Packages:** GitHub/GitLab, Jupyter Notebooks, Numpy, Pandas, Tensorflow, Tkinter, Kivy, OpenCV, Microsoft Office

**Machine Learning:** Reinforcement Learning, Classification (SVM, LDA, Neural Networks), PCA, Regression, Random Forests

**Predictive Modeling:** Bayesian Modeling, Linear and Nonlinear Causality Analysis (Granger Causality / Convergent Cross Mapping)

**Signal Processing:** Fourier transform (FFT), Hilbert transform, Feature Extraction, Bandpass Filtering, Artifact Rejection

**Complex Systems:** Phase-Space Reconstruction, Recurrence quantification analysis, Topological Data Analysis, Bifurcation Diagrams

**Hardware:** Arduino, Raspberry Pi, Neuralynx Neural Implants, Electronic Circuit Construction, Servo Motors, IR sensors, Kinect

**Languages:** English – (Native Speaker), Mandarin Chinese – (Limited Working Proficiency in Reading, Writing, and Speaking)

### EDUCATION

**Ph.D. Candidate in Cognitive Science (ABD)**

**Master of Science (MS) in Cognitive Science**

**University of California, San Diego (UCSD)**

September 2014 – Present

GPA: 3.967

**Bachelor of Arts (BA);**

**Majors: Psychology, History, and Chinese Studies**

**Hofstra University**

September 2010 – May 2014

GPA: 3.87

### EXPERIENCE

**Graduate Researcher – Andrea Chiba Lab – August 2015 – Present**

Worked with Professor Andrea Chiba and Dr. Laleh Quinn on a goal-oriented reinforcement learning paradigm where rodents learn how to control robotic agents. I have managed multiple groups of students, research scientists, post-docs, and electrical/mechanical/control engineers to acquire behavioral/neural data then analyze that data using statistics, probabilistic modeling, dynamical systems analysis and machine learning techniques.

**Visiting Scholar – Complex and Intelligent Systems Lab – UQ School of IT & EE, Brisbane, AU – March 2016, November 2017**

Worked with Professor Janet Wiles and her engineering team at the University of Queensland to create novel methods for dynamical systems analysis.

**Instructor – UCSD – COGS 100: Cyborgs & AC Intro to Cognitive Science – Summer 2015 – Present**

I am currently the instructor for an undergraduate course COGS 100: Cyborgs Now and In The Future where I teach foundations in computational cognitive science and human-computer interaction design. I also taught a high school introduction to cognitive science class for four consecutive summers with the Academic Connections program at UCSD, where I taught students psychology, neuroscience, AI and machine learning.

### PROJECTS

**“Convergent Cross Sorting for Estimating Dynamic Coupling”**

US Air Force Office of Scientific Research – AU Defense Science and Technology Group Grant Awarded

*Best Paper Award, 1st Annual Review and Workshop AFOSR – DSTG Co-Sponsored Research Program on Trusted Autonomy*

In collaboration with UQ, the US Air Force Research Lab and the Australian Department of Defense’s Defense Science and Technology Group, we have produced novel tools in Matlab for convergent cross-mapping, fractal dimension estimation, recurrence quantification analysis, and topological data analysis. I played a key role in writing the grant application and grant reports.

**“PiRat: An autonomous framework for studying social behavior in rats and robots.”**

*2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2018), Madrid, Spain*

Our international research team has created a motion tracking system using Kinect2 for tracking rats and robots as they interact with each other. Our team has also developed a GUI in Python for visualizing the tracking information and controlling the robot autonomously. The purpose of the system is to act as an experimental apparatus to examine whether rats perceive autonomous robots as animate creatures.

### TECHNICAL DEMONSTRATIONS

**“OpenBCI DIY Educational Platform: Build Your Own Mind Controlled Robot”**

*Equity Journey: Investing in the Whole Learner. Grantmakers for Education Conference 2018. Coronado, CA*

Sponsored by the Chan Zuckerberg Initiative, Gates Foundation, Deutsche Bank, and multiple venture capital firms.

**“Brain-controlled devices and the internet of things”**

*IBM Artificial Intelligence for Healthy Living Center (AIHL) SmartHome Demonstration at Calit2, UCSD, La Jolla, CA.*

### RELEVANT COURSEWORK

Probabilistic Modeling, Data Analysis in Matlab, Introduction to The Physics of Complex Systems, Applied Complexity, Computational Modeling of Cognition, Multisensory Processing, Applied Linear Algebra, Computational Neurobiology