Curriculum Vitae

Eric J. Leonardis MS, PhD (ABD)

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EDUCATION

University of California, San Diego – September 2014 to Present
Ph.D. Candidate in Cognitive Science (ABD)
Research Interests: Systems Neuroscience, Robotics, Animal Behavior
Temporal Dynamics of Learning Center Trainee
GPA: 3.967
Grants Awarded:
"A Neurobehavioral Foundation for Affective Computing: Rat-Robot Brain-Computer Interfaces for Dynamic Interaction"
Kavli Institute for the Brain and Mind (KIBM) Innovative Research Grant – May 2016 to August 2017 –
"Discovering patterns in human-robot interaction: New tools for complex adaptive social systems"
US-AU AFOSR/DSTG Grant – January 2017 to May 2019 –
Best paper award at the 1st Annual Review and Workshop AFOSR – DSTG Co-Sponsored Research Program on Trusted Autonomy

Hofstra University – Fall 2010 to Spring 2014
Bachelor of Arts (BA); Triple Major in Psychology, History and Chinese Studies (Language and Culture)
Summa Cum Laude; Phi Beta Kappa; Honors College Associate; Provost's Scholar and Dean's List, Vince Brown Scholarship
GPA: 3.87
Activities: President of The Hofstra Neuroscience Club 2014, Studied Abroad – East China Normal University – June 2011

RESEARCH EXPERIENCE

Graduate Researcher – Andrea Chiba Lab – Aug 2015 – Present
Working with Professor Andrea Chiba and Dr. Laleh Quinn on a rodent behavioral paradigm where a rodent learns how to control a robot in a goal oriented reinforcement learning paradigm.

Visiting Scholar – Complex and Intelligent Systems Laboratory – Mar 2016 – Nov 2017
Worked with Professor Janet Wiles at the University of Queensland on Recurrence Quantification Analysis / Topological Data Analysis.

Graduate Researcher – Cognitive Neuroscience and Neuropsychology Lab – Aug 2014 – Aug 2015
Worked with Professor Ayse Saygin on using electrophysiological techniques to investigate the neural basis of biological motion perception, the uncanny valley, and human-robot interaction. I was responsible for designing experiments, analyzing data, programming android robots (Hanson Robotics' Einstein HUBO) and experimental interfaces.

Lab Rotation – Cognitive and Neural Dynamics Lab – Mar 2015 – June 2015
Worked with Professor Bradley Voytek and a team of lab members to perform EEG data analysis using electrophysiological methods.

Lab Assistant – Human and Artificial Learning Lab – June 2013 – Aug 2014
Assisted Professor Oskar Pineño with designing Arduino physical computation applications. Constructing a low-cost EEG operated brain-computer interface and linking it with robotic devices.

Editing Intern – "The History and Evolution of Psychology: A Philosophical and Biological Perspective" – 2013– 2014
Paid academic internship with Professor Brian D. Cox, editing bibliographic information for a history of psychology textbook.

TEACHING EXPERIENCE

UC San Diego

Instructor / Teaching Assistant – COGS 8 – Hands-On Computing – Winter 2015, Spring 2016, Spring 2019, Spring 2020
Taught Arduino programming in C and robotics from the perspective of cognitive science.

Instructor / Teaching Assistant – COGS 100 – Cyborgs Now and In The Future – Spring 2018, Fall 2018, Winter 2019
Assisted Professor Taylor Scott and Professor David Kirsh to teach an introduction to classical AI / cognitive science and human-computer interaction theory such as embodied, distributed and situated cognition in 2018. Lead as an instructor in Winter 2019.

Instructor – Academic Connections – Introduction to Cognitive Science – Summer 2015, 2016, 2017, 2018, 2019, 2020
Worked with co-instructor Tom Donoghue to design and teach an introduction to cognitive science class for high school students, more than 40 hours of lectures spanning psychology, robotics, AI, neuroscience, linguistics, anthropology and philosophy.

Instructor – Academic Connections – Hands-On Computing for Cognitive Science – Summer 2020
Taught an online class for high school students about simulating nonlinear dynamical systems using Processing programming language.

Co-Instructor – COMM 190 – Performing Cybernetics – Spring 2017
Assisted Dr. Stefan Tanaka, Dr. Deborah Forster, and Yelena Gluzman to create an interactive group performance of the transcripts of Macy Conferences on Cybernetics.

Teaching Assistant – COGS 17 – Neurobiology of Cognition – Fall 2015 **– COGS 184 - Modeling the Evolution of Cognition** – Winter 2015 – **COGS 179 – Cognitive Electrophysiology –** Fall 2019 **– COGS 170 – Brain Waves Across Scales –** Winter 2020

Hofstra University

Teaching Assistant – Physical Computation for Psychology – June 2013 – August 2014
Peer Teacher – CHIN 003 – Intermediate Chinese – September 2013
Peer Teacher – HIST 14F – Inhuman Race: Monstrous Doppelgängers and the Undead – Fall 2011

REFERENCES

Publications and Conference Papers

Heath, S., Ramirez, C., Arnold, J., Olsson, O., Taufatofua, J., Pounds, P., Wiles, J., Leonardis, E., Gygi, E., Leija, E., Quinn, L., Chiba, A. (2018) 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*.

Leonardis, E. (2017). Amygdala. *Encyclopedia of Animal Cognition and Behavior*. (Eds. Vonk, J. & Shackelford, T.K.) Springer.

Leonardis, E. (2017). Hippocampus. *Encyclopedia of Animal Cognition and Behavior.* (Eds. Vonk, J. & Shackelford, T.K.) Springer.

Leonardis, E. & Saygin, A. (2015). Humanoid Robots and the Social Brain: Ethical Implications. *The Emergent Policy and Ethics of Human-Robot Interaction Workshop At Human-Robot Interaction (HRI) 2015 10th ACM/IEEE International Conference.*

Leonardis, E. (2014). The Scientific Quest for Purity: American Eugenics and the Family Studies, 1877-1926. *Bachelor's Honors Thesis. Received High Honors in the Hofstra University History Department.*

Poster Presentations

Heath, S., Ramirez, C., Arnold, J., Olsson, O., Taufatofua, J., Pounds, P., Wiles, J., Leonardis, E., Gygi, E., Leija, E., Quinn, L., Chiba, A. (2018) PiRat: An autonomous rat-sized robot as a social companion for studying social behavior in rats using real-time tracking. *Society for Neuroscience Conference 2016*, San Diego, CA.

Leonardis, E., Heath, S., Wiles, J., Chiba, A. A., Quinn, L. K. (2016). Social Investigation of Conspecifics and Robots: Oscillatory Neural Dynamics. *Society for Neuroscience Conference 2016*, San Diego, CA.

Leonardis, E., Heath, S., Wiles, J., Quinn, L. K., Chiba, A. A. (2016). A Social Brain-Computer Interface for Rat-Robot Interactions. *Network for The Science of Learning Meeting 2016,* February 8th in Arlington, VA.

Technical Demonstrations

Leonardis, E., D'Amico, A., Guerin, S., Verhoef, T., & de Sa, V. (2018). PenguinBird OpenBCI DIY Educational Platform. *The Equity Journey: Investing in the Whole Learner. Grantmakers For Education Conference 2018.* Coronado, CA

Leonardis, E., Mousavi, M., Miller-Rigoli, C., Cooper, H., Contreras, F., & Verhoef, T. (2018). PenguinBird: Dancing Robot Brain-Computer Interface. *IBM Artificial Intelligence for Healthy Living Center (AIHL) SmartHome Demonstration* at Calit2, UCSD, La Jolla, CA.

Leonardis, E., Heath, S., Wiles, J., Quinn, L. K., Chiba, A. A. (2016). Brain-Computer Interfaces (BCI) for Social Interaction and Animal Models. *Temporal Dynamics of Learning Center Demo Session*, January 28th in La Jolla, CA.

Invited Talks + Lectures

Leonardis, E. (2018, 2019). Cyborg as Post-Human. Invited Guest Lecture for *COGS 100 Cyborgs Now and In The Future* with Professor Taylor Jackson Scott and Instructor Michael Allen.

Leonardis, E. (2017). Ghosts of Eugenics in Cyberspace: Historical Algorithms and Data Science. Invited Guest Lecture on Data Ethics for *COGS 9 Introduction to Data Science* with Dr. Jason Fleischer.

Leonardis, E. (2017). Rats, Robots, Respiration and Rhythm. *Cognition at Work: UCSD Cognitive Science Student Association's 11th Annual National Cognitive Science Conference*, April 9th, La Jolla, CA.

Leonardis, E. (2016). The Ghost of Eugenics in Cyberspace? Better Babies, IQ and Selection Algorithms. *National Science Foundation's Meet Tomorrow's World: A Meeting on The Ethics of Emerging Technologies*, November 11th, 2016.

Science Communication Events + Exhibited Art

Leonardis, E. (2020). The Limits of Time Travel. Secret Society of Adultologists: Time Machine at the San Diego Natural History Museum. San Diego, CA.

Leonardis, E. (2019). Brain-Computer Interfaces: Applications and Ethical Conundrums. National Geographic Brain Games and San Diego Nerd Nite San Diego Comic Con Shark Party. Hotel Solamar, San Diego, CA.

Leonardis, E. (2019). Introducing David Cronenberg's The Fly. Reel Science 3.0 at Digital Gym Cinema with SD Film Geeks and San Diego Natural History Museum. San Diego, CA.

Leonardis, E. (2019). Are you just a pack of neurons? San Diego Nerd Nite: Neuro Nite, February 19th at 32 North Brewing Co.

Leonardis, E., Contreras, F., Gluzman, Y., Young, J., Cooper, H., & Verhoef, T. (2018) Robot Races. *Games and Activities Schedule*. *Dirtybird Campout West*. Modesto, CA.

Leonardis, E., Cooper, H., Olarte, J., Blyther, D., Littell, B. & Verhoef, T. (2017) BrainScratch Science LaB. *Games and Activities Schedule*. *Dirtybird Campout*. Bradley, CA.

Leonardis, E., Robertson, C., & Kerns, S. (2016) Desert Hearts Does Science. *Emergency Index Vol. 5.* New York, New York. Ugly Duckling Press.

Gluzman, Y. & Leonardis, E. (2015). Their Position. *The Ephemeral Objects Exhibit.* San Diego, CA: San Diego Art Institute.

SKILLS

Languages: English, Matlab, Python, Arduino, Processing, C, Mandarin Chinese (limited working proficiency)

Packages: OpenCV, Tensorflow, Jupyter Notebooks, Recurrence Plot Toolbox, Microsoft Office: (Word, PowerPoint, Excel), Numpy, Pandas

Signal Acquisition: EEG, Local Field Potential, Multi-Unit Activity

Signal Processing: Fourier Transform (frequency and amplitude), Hilbert Transform, Filtering

Machine Learning: Reinforcement Learning, Classification Nonlinear Forecasting, Regression, Deep Learning

Dynamical Systems: Differential Equations, Phase-Space Reconstruction, Convergent Cross Mapping