Curriculum Vitae

Eric J. Leonardis, PhD

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EDUCATION AND TRAINING

Salk Institute for Biological Studies – August 2022 to Present
Postdoctoral Fellow
Research Interests: Multi-Agent Deep Reinforcement Learning

University of California, San Diego – September 2014 to June 2022
PhD in Cognitive Science "Interactive Neurorobotics: Brain and Body Coupling During Interactive Multi-Agent Scenarios"
Research Interests: Systems Neuroscience, Robotics, Behavior
National Science Foundation Temporal Dynamics of Learning Center Trainee
GPA: 3.98
Grants Awarded:
"Discovering patterns in human-robot interaction: New tools for complex adaptive social systems" $300,000
US-AU Air Force Office of Scientific Research / Defense Science and Technology Group 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
"A Neurobehavioral Foundation for Affective Computing: Rat-Robot Brain-Computer Interfaces for Dynamic Interaction" $25,000
Kavli Institute for the Brain and Mind (KIBM) Innovative Research Grant – May 2016 to August 2017 –

Hofstra University – Fall 2010 to Spring 2014
Bachelor of Arts (BA); Triple Major in Psychology, History and Chinese Studies
Summa Cum Laude; Phi Beta Kappa; Honors College Associate; Provost's Scholar and Dean's List, Vince Brown Scholarship
GPA: 3.87

RESEARCH EXPERIENCE

Postdoctoral Fellow – Talmo Pereira and Tom Albright Lab – Aug 2022 – Present
Working with Talmo Pereira and Tom Albright on deep pose tracking in animals and humans, as well as multi-agent deep reinforcement learning.

Graduate Researcher – Andrea Chiba Lab – Aug 2015 – Spring 2022
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 textbook published with Routledge.

TEACHING EXPERIENCE

UC San Diego

Instructor / Teaching Assistant – COGS 8 – Hands-On Computing – Fa 2020, Wi 2015, 2021, Spr 2016, 2019, 2020, 2022
Taught Arduino programming in C and robotics from the perspective of cognitive science. Lead as instructor Spr 2020 – Wi 2021

Instructor / Teaching Assistant – COGS 100 – Cyborgs Now and In The Future – Spr 2018, Fa 2018, Wi 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 - 2022
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

REFERENCES

Publications and Conference Papers

Leonardis, E.J., Breston, L., Lucero-Moore, R., Sena, L., Kohli, R., Schuster, L., Barton-Gluzman, L., Quinn, L.K., Wiles, J., & Chiba, A.A. (Under Review) Interactive Neurorobotics: Behavioral and Neural Dynamics of Agent Interactions. Frontiers in Psychology Special Issue on Robots and Bionic Systems as Tools to Study Cognition: Theories, Paradigms, and Methodological Issues.

Leonardis, E. (Chair), Turner, M., Pelkey, J., Semenuks, A., Coulson, S., Adachi, I. & Forster, D. (2021). Conceptual Blending in Animal Cognition: A Comparative Approach. *43rd Annual Cognitive Science Society Conference 2021*, Vienna, AUT

Breston, L., Leonardis, E. J., Quinn, L. K., Tolston, M., Wiles, J., & Chiba, A. A. (2021). Convergent Cross Sorting for Estimating Dynamic Coupling. *Scientific Reports*, 11(1), 1-10.

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. & 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.*

Conference Talks + Invited Lectures

Leonardis, E., Semenuks, A., & Coulson, S. (2021). What is indexical and iconic in animal blending? In Conceptual Blending in Animal Cognition: A Comparative Approach. *43rd Annual Cognitive Science Society Conference 2021*, Vienna, AUT

Leonardis, E. (2020). The Misuse of Algorithms in Data Science. Invited Guest Lecture *for COMM 164 Behind the Internet: Invisible Geographies of Power and Inequality* with Instructor Yelena Gluzman.

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). 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. (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.

Poster Presentations

Mullane, M. D., Cooper, H., Lindner, T., Leonardis, E. J., & Chiba, A. A. (2018). Perceiving emotional sounds (MAARI): Individual differences, prior learning and context. *Society for Neuroscience* and *Society for Social Neuroscience Conference 2018*, San Diego, CA.

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 2018*, 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.

Science Communication, Radio/Podcasts, and Exhibited Art

Leonardis, E. (2020). The Return. Reel Science Panel. Horrible Imaginings Film Festival. The Frida Cinema, Santa Ana, CA.

Accomando, B. (2020). Global Pandemic Film Primer with Eric Leonardis. Cinema Junkie Podcast on KPBS. San Diego, CA.

Accomando, B. (2020). Pop Culture, Neuroscience, And COVID-19 with Eric Leonardis. KPBS Midday Edition. San Diego, CA.

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. Radio Promo on KPBS Midday Edition and Cinema Junkie Podcast.

Leonardis, E., Cooper, H., Olarte, J., & Verhoef, T. (2017) BrainScratch Science LaB. *Dirtybird Campout*. Bradley, CA.

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

Peer-Reviewer

Frontiers in Bioengineering and Biotechnology, Section on Bionics and Biomimetics: Hypothesis and Theory