

SANDRA A.

ROMERO  
PINTO

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## Skills

### Programming Languages

Python  
MATLAB  
Labview

### Libraries

PyTorch  
Pandas  
SciPy  
Gym

### Finite element modelling

Comsol Multiphysics

### Prototyping

AutoCAD

### Neuroscience & Signal Processing

Calcium imaging  
Fiber photometry  
High-density electrophysiology

### Languages

Spanish - *Native*  
English - *Fluent*  
Italian - *Fluent*  
Portuguese - *Fluent*  
French - *Intermediate*

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## Contact

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## Education

### Harvard University

Cambridge, MA - USA

PhD candidate, Harvard-MIT program in Speech and Hearing Bioscience and Technology

Sep 2018 - Today

### École Polytechnique Fédérale de Lausanne (EPFL)

Lausanne, Switzerland

Master of Science, Bioengineering, Minor in Neuroprosthetics

Funding: Novartis Excellence Scholarship

Granted Bertarelli Fellowship for thesis development at Harvard Medical School

Graduation grade: 5.67/6

Sep 2015 - Jan 2017

### Politecnico di Milano

Milano, Italy

Bachelor of Science, Biomedical Engineering

Double degree program with ITESM

Graduation grade: 110 cum Laude/110

Sep 2011 - Jun 2015

### Instituto Tecnológico de Estudios Superiores Monterrey (ITESM)

Monterrey, Mexico

Bachelor of Science, Biomedical Engineering, Honors program

Double degree program with Politecnico di Milano

Aug 2011 - May 2014

## Publications - Peer Reviewed

Romero Pinto, SA., Height, AE., Clayton, K., Resnik, J., Williamson, R., Hancock, KE., Polley, DB. Cellular and widefield imaging of sound frequency organization in primary and higher order fields of the mouse auditory cortex. *Cerebral Cortex* (2020)

Aravindakshan, P., Romero Pinto, SA., Lewis, RM., Goedicke, W., Polley, DB. Data-driven segmentation of audiometric phenotypes across a large clinical cohort. *Scientific Reports* (2020)

Gaillet, V., Cutrone, A., Artoni, F., Vagni, P., Mega Pratiwi, A., Romero Pinto, SA., Lipucci Di Paola, D., Micera, S., Ghezzi, D. Spatially selective activation of the visual cortex via intraneural stimulation of the optic nerve. *Nature Biomedical Engineering* (2019)

Nist-Lund, CA., Pan, B., Patterson, A., Asai, Y., Chen, T., Zhou, W., Zhu, H., Romero Pinto, SA., Resnik, J., Polley, DB., Geleoc, G., Holt, J. Improved TMC1 gene therapy restores hearing and balance in mice with genetic inner ear disorders. *Nature Communications* (2019)

## Publications - In preparation

Romero Pinto, SA., Uchida, N. Linking tonic dopamine and biased value predictions in a biologically inspired reinforcement learning model.

Markowitz, J., Gillis, W., Jay, M., Wood, J., Harris, R., Ciezowski, R., Brann, D., Koveal, D., Kula, T., Weinreb, C., Romero Pinto, SA., Uchida, N., Linderman, S., Sabatini, B., Datta, SR. Spontaneous behavior is structured by reinforcement without reward.

## Contributed talks

Romero Pinto, SA., Uchida, N. Linking tonic dopamine and biased value predictions in a biologically inspired reinforcement learning model. *Multi-disciplinary Conference on Reinforcement Learning and Decision Making-RLDM* (2022)

Romero Pinto, SA., Uchida, N. Linking tonic dopamine and biased value predictions in a biologically inspired reinforcement learning model. *Cosyne* (2022)

## Conference Abstracts

Romero Pinto, SA., Uchida, N. Distributional reinforcement learning explains ensemble dopamine responses in habenula lesioned mice. *Cosyne* (2021)

Romero Pinto, SA., Height, AE., Balaram, P., Resnik, J., Hancock, KE., Polley, DB. Spatial organization of primary and higher-order fields in the mouse auditory cortex. *ARO* (2019)

Aravindakshan, P., Romero Pinto, SA., Hancock, KE., Polley, DB. Individual variability in temporal fine structure processing underlying speech-in noise intelligibility in listeners with normal audiograms. *ARO* (2019)

Romero Pinto, SA., Height, AE., Resnik, J., Polley, DB. Data-driven segmentation of mouse auditory cortical fields based on mesoscale optical Ca<sup>2+</sup> imaging. *Society for Neuroscience* (2017)

Ramachandran, BR., Romero Pinto, SA., Born, J., Winkler, S., Ratnam, R. Measuring neural, physiological and behavioral effects of frustration. *17th International Conference on Biomedical Engineering* (2016)

## Awards and Honors

Albert J. Ryan Fellowship <i>Harvard Medical School -Ryan Foundation. Funding for doctoral research and travel allowance</i>	2022-2023
Bertarelli Fellowship in Translational Neuroscience and Neuroengineering <i>EPFL-Harvard Medical School. Funding for masters thesis development at Harvard</i>	2016-2017
Singapore International Pre-Graduate Award (SIPGA) <i>Agency for Science, Technology and Research (A*STAR). Funding for research internship.</i>	Summer 2016
Novartis Excellence Scholarship <i>EPFL-Novartis. Financial aid throughout the two-year master program.</i>	2015-2016
Diploma cum laude <i>Politecnico di Milano. Graduation with honors, BSc. Biomedical Engineering</i>	2015
Scholarship 'Beca Sudamérica Profesional' <i>ITESM. Financial aid for undergraduate program in Biomedical Engineering.</i>	2011-2014

## Research Experience

### Reinforcement Learning

**Harvard University** **Dec 2019 - Present**  
Biological Laboratories Dissertation research, Uchida Lab  
Cambridge, MA - USA

- Doctoral thesis project: '*Linking tonic dopamine and biased value predictions with a biologically inspired reinforcement learning model*'. Mentored by Prof. Naoshige Uchida.
- '*Belief state representation in the prefrontal cortex*'. Collaboration with Prof. Sam Gershman.

**University College London (UCL)** **Feb 2018 - Aug 2018**  
Sainsbury Wellcome Centre for Neural Circuits and Behaviour (SWC) Research Assistant, S-J Lab  
London - UK

- '*Prospective value coding in the Habenula-projecting Entopeduncular nucleus*'. Mentored by Fred March, PhD and Marcus Stephenson-Jones, PhD.

### Auditory Neuroscience

**Harvard Medical School (HMS)** **Aug 2018 - Feb 2019**  
Eaton Peabody Laboratories (EPL) Graduate Student Researcher, Polley Lab  
Cambridge, MA - USA

- Rotation research: '*Multi-scale imaging to characterize the spatial Organization of Primary and Higher-Order Fields in the Mouse Auditory Cortex*'. Mentored by Prof. Daniel Polley.
- '*Data-driven clustering of audiometric aging phenotypes across a large clinical cohort*'. Collaboration with Aravindakshan Parthasarathy, PhD.

**Harvard Medical School (HMS)** **Mar 2017 - Jan 2018**  
Eaton Peabody Laboratories (EPL) Bertarelli Fellow, Polley Lab  
Cambridge, MA - USA

- Masters thesis: '*Data-driven segmentation of mouse auditory cortical fields based on mesoscale optical Ca2+ imaging*'. Mentored by Prof. Daniel Polley.
- '*TMC gene therapy for the treatment of congenital deafness*'. Collaboration with Holt Lab, Boston Children's Hospital.

### Neuroprosthetics and Translational Neuroscience

**École Polytechnique Fédérale de Lausanne (EPFL)** **Sep 2016 - Dec 2016**  
Medtronic Chair of Neuroengineering Graduate Student Researcher, Ghezzi Lab  
Lausanne - Switzerland

- Minor in Neuroprosthetics: '*Optic Nerve Stimulation using self-opening neural interface for vision restoration*'. Mentored by Prof. Diego Ghezzi.

**Advanced Digital Science Center (ADSC)**  
University of Illinois at Urbana-Champaign in Singapore  
Singapore

**June 2016 - Sep 2016**  
A\*Star Fellow

- Project: *'Profiling Analytics using Body-Worn Physiological Sensors, Eye-tracking and EEG'*. Mentored by Prof. Stefan Winkler.

**Politecnico di Milano**  
Laboratory of Biological Structure Mechanics  
Milan - Italy

**Feb 2015 - July 2015**  
Undergraduate researcher

- Bachelors thesis : *'Optimization of cell seeding efficiency in polymeric fiber scaffolds'*. Mentored by Elena Bianchi, PhD.

**Medical University of Vienna**  
Center for Medical Physics and Biomedical Engineering  
Vienna - Austria

**May 2014 -Sep 2014**  
Undergraduate student intern

- Project: *'Frequency alternating current in non-invasive spinal cord stimulation'*. Mentored by Prof. Winfried Mayr and Matthias Krenn, PhD.

## Teaching

Harvard Program in General Education  
Teaching Fellow, Artificial and Natural Intelligence (GENED 1125)

Jan 2021 - May 2021

Harvard College  
Neurobiology of Perception and Decision Making (NEURO 145)

Aug 2020 - Dec 2020

## Service

Women in STEM Organization (WiStem) 2021  
*Judge at Envision. Competition of research proposals for female high school students*

Simply Neuroscience's Action Potential Advising Program (APAP) 2021  
*Advisor for high-school students interested in neuroscience*

'Hablemos Hoy' program (ITESM) 2013 - 2014  
*English teacher for high-school students*

Virtual high- school (ITESM) 2013 - 2014  
*Public health virtual teacher for high-school students*

## Extracurricular

ExpoTec Student Festival (ITESM) - *Treasurer* 2013

Symposium in Biomedical Engineering (ITESM) - *Program manager* 2013

Whilar Surf School - *Surfing instructor* 2004-2007

Mathematics inter-school contest (ADECOPA) , rank: 3/220 2006

## References

### Naoshige Uchida, PhD.

Professor of Molecular and Cellular Biology  
+1 617-495-2335. uchida@mcb.harvard.edu

### Daniel Polley, PhD.

Associate Director, Eaton-Peabody Laboratories  
Associate Professor of Otolaryngology, Harvard Medical School  
+1 617-391-5951. daniel.polley@meei.harvard.edu

### Marcus Stephenson-Jones, PhD.

Group Leader, Sainsbury Wellcome Centre for Neural Circuits and Behaviour, UCL  
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### Diego Ghezzi, Ph.D.

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Medtronic Chair in Neuroengineering  
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