Renato Paredes Venero

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PROFILE

Computational Neuroscientist. I study the neural basis of cognition and behaviour in neurological and psychiatric conditions through experimental research and computational modelling. My main interest is multisensory integration processes underlying bodily self alterations. I also actively collaborate in the field of human-robot interaction, focusing on the validation of emerging technologies for mental health and education. I currently work as an Assistant Professor at Pontifical Catholic University of Peru, where I lead the Computational Cognitive Neuroscience Lab.

RESEARCH EXPERIENCE

Pontifical Catholic University of Peru

Head of Computational Cognitive Neuroscience Lab — *Jan 2023 – Present*

- I started the implementation of this new lab in the Department of Psychology, actively setting standards for workflow, equipment, human resources and software management.
- I lead a team of 16 people among researchers, assistants, and students working on cognitive neuroscience projects using computational methods (More details: laboratorio-dptopsicologia.pucp.edu.pe).

Principal Investigator (*Department of Psychology*) — *Aug 2023 – Present*

- Project: "Towards the development of a neurocomputational profile of Peruvian women with symptoms of CPTSD"
- Project: "Multisensory integration and auditory sensitivity in students with high abilities at a private university in Metropolitan Lima"
- Project: "Melodies of the mind: Deciphering the impact of music on the regulation of affective and cognitive states of university students using EEG and NLP"

Co-researcher (*Department of Engineering*) — *Apr 2021 – Apr 2023*

- Project: "Teleoperated Mobile Robot for Mental Health Delivery in Patients with Infectious Diseases"

Research Assistant (*Department of Psychology*) — *Mar 2016 – May 2018*

- Project: "Neurocognitive study of perception of actions and emotions in the interaction between human beings and humanoid robots"

Junior Researcher (*DGI*) — *Set 2015 – May 2016*

- Project: "Implementation of a non-invasive EEG System for the study of Human Mirror Neurons".

Max Planck Research Unit for Neurogenetics

Doctoral Researcher — *Dec 2024 – Apr 2025*

- I conducted computational and statistical analysis of STPT images of the mouse olfactory bulb.

The University of Edinburgh

Remote Research Assistant (*Computational Psychiatry Lab*) — *Sep 2019 – Aug 2021*

- I started the collaboration with two laboratories of world-class universities (NYU & University of Chieti-Pescara).
- I led the process of writing and publishing two articles on neural networks in high impact journals.

University of Waseda
Data Analysis Consultant (*School of International Liberal Studies*) *May – Sep 2018*
- I implemented Generalized Linear Models for data analysis in Human-Robot Interaction (HRI) studies.
- I co-authored papers in relevant HRI journals and conferences.

TEACHING EXPERIENCE

Pontifical Catholic University of Peru
Assistant Professor (*Department of Psychology*) *Jan 2025 – Present*
- Neuropsychology

Full-time Lecturer (*Department of Psychology*) *Aug 2022 – Dec 2024*

Undergraduate
- Behavioural Neuroscience
- Neuropsychology
- Introduction to Python for Psychological Research
- Non experimental research methods and Statistics

Postgraduate
- Statistics and Mathematical Psychology
- Research Methods for Psychology

Adjunct Lecturer (*Department of Psychology*) *Jan 2021 – July 2022*
Teaching Assistant (*Department of Psychology*) *Mar 2017 – Sep 2018*
- Research Methods and Statistics I

Continuing Education Teacher (*CETAM*) *Jan – Apr 2018*
- Research Methods for Human-Machine Interaction

Neuromatch Academy Inc.
Teaching Assistant *Jun 2020 – Jul 2022*
- Support students in learning the theory and techniques of deep learning with an emphasis on neuroscience.
- Support students in learning computational neuroscience and analytical modelling of brain activity.
- Review of didactic material for theoretical and practical learning sessions.

EDUCATION

National University of Cordoba **Cordoba, Argentina**
PhD in Neuroscience (*to be awarded*) *Jun 2021 - Apr 2025*
Supervisors: Dr. Peggy Series and Dr.Pablo Barttfeld
Topic: "Neural Network modelling of multisensory integration in patients with schizophrenia and autism spectrum disorder"
Defence date: 09/04/2025

The University of Edinburgh **Edinburgh, UK**
MSc. in Cognitive Science, with Distinction and Dissertation Prize *Sep 2018 - Aug 2019*
Supervisor: Dr. Peggy Series
Topic: "Computational modelling of peripersonal space representation in schizophrenia spectrum disorders"

Pontifical Catholic University of Peru **Lima, Peru**
B.A. in Educational Psychology, with Outstanding Mention *Mar 2010 - Jul 2016*

AWARDS

- Winner of the Annual Research Project Grant (CAP - PUCP 2023-2024).
- Winner of the Research Support Grant (FAI - PUCP 2023).
- Cognitive Science Msc Dissertation Prize (The University of Edinburgh)
- First position of the Excellence Scholarship "President of the Republic“ - 2018 granted by PRONABEC (MINEDU).
- Best paper award in the category "Excellence in Engineering Education“ at IEEE Global Engineering Education Conference (EDUCON 2017).
- Thesis approved unanimously with outstanding mention during undergraduate studies.
- Winner of the Programme to Support Initiation in Research (PAIN - PUCP 2015).
- Scholarship holder of the student mobility program of the Interuniversity Development Centre (CINDA 2013).

PARTICIPATION IN EVENTS

- Scientific Committee at X Congreso Latinoamericano de Psicología de la Salud (ALAPSA).
- Oral presentation at Adriatica Summer School 2024.
- Oral presentation at the ALADAA International Conference 2023.
- Poster presentation at Bernstein Conference 2021.
- Reviewer at international conferences on Human-Robot Interaction: ICSR (2020) and RO-MAN (2017-2024).
- Programme Committee and paper presentation at the International Workshop on Evaluation Methods Standardisation for Human-Robot Interaction (EMSHRI 2017).

SEMINARS AND TALKS

- MAR 2025: ANC Workshop at Institute for Adaptive and Neural Computation (The University of Edinburgh)
- FEB 2025: Lab Meeting at Laboratory of Cognitive Neuroscience (EPFL Campus Biotech, Geneva)
- APR 2025: Lab Meeting at Multisensory Processing Lab (UCLA, Los Angeles)

INFORMATICS SKILLS

- Programming Languages: Python, R, SQL, Java
- Scientific software development: Python scientific stack, Pytest, Tox
- Technical documentation: LaTex, Overleaf, Markdown, Sphinx
- Database management: MySQL, Hive, Impala
- Development environments: Linux, RStudio, Visual Studio Code, Google Colab, Git

PUBLICATIONS

Journal Articles

Paredes, R., Cabral, J. B., & Seriès, P. (2025a). Scikit-NeuroMSI: A Generalized Framework for Modeling Multisensory Integration. *Neuroinformatics*, *23*(3), 40. https://doi.org/10.1007/s12021-025-09738-1

Paredes, R., Ferri, F., Romei, V., & Seriès, P. (2025b). Increased excitation enhances the sound-induced flash illusion by impairing multisensory causal inference in the schizophrenia spectrum. *Schizophrenia Research*, *283*, 1–10. https://doi.org/10.1016/j.schres.2025.06.007

Pérez-Zuñiga, G., Arce, D., Gibaja, S., Alvites, M., Cano, C., Bustamante, M., Horna, I., **Paredes**, R., & Cuellar, F. (2024). Qhali: A Humanoid Robot for Assisting in Mental Health Treatment. *Sensors*, *24*(4), 1321.

Gomez-Quispe, J. M., Pérez-Zuñiga, G., Arce, D., Urbina, F., Gibaja, S., **Paredes**, R., & Cuellar, F. (2023). Non Linear Control System for Humanoid Robot to Perform Body Language Movements. *Sensors*, *23*(1), 552.

Paredes, R., Ferri, F., & Seriès, P. (2022). Influence of E/I balance and pruning in peri-personal space differences in schizophrenia: a computational approach. *Schizophrenia Research*, *248*, 368–377. https://doi.org/10.1016/j.schres.2021.06.026

Noel, J.-P., **Paredes**, R., Terrebonne, E., Feldman, J. I., Woynaroski, T., Cascio, C. J., Seriès, P., & Wallace, M. T. (2022). Inflexible updating of the self-other divide during a social context in autism: psychophysical, electrophysiological, and neural network modeling evidence. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, *7*(8), 756–764. https://doi.org/10.1016/j.bpsc.2021.03.013

Marius't Hart, B., Achakulvisut, T., Adeyemi, A., Akrami, A., Alicea, B., Alonso-Andres, A., Alzate-Correa, D., Ash, A., Ballesteros, J. J., Balwani, A., et al. (2022). Neuromatch Academy: a 3-week, online summer school in computational neuroscience. *Journal of Open Source Education*, *5*(49), 118. https://doi.org/10.21105/jose.00118

Trovato, G., De Saint Chamas, L., Nishimura, M., **Paredes**, R., Lucho, C., Huerta-Mercado, A., & Cuellar, F. (2021). Religion and Robots: Towards the Synthesis of Two Extremes. *International Journal of Social Robotics*, *13*, 539–556. https://doi.org/10.1007/s12369-019-00553-8

Trovato, G., Lopez, A., **Paredes**, R., Quiroz, D., & Cuellar, F. (2019). Design and Development of a Security and Guidance Robot for Employment in a Mall. *International Journal of Humanoid Robotics*, *16*(5). https://doi.org/10.1142/S0219843619500270

Trovato, G., Lucho, C., & **Paredes**, R. (2018a). She's Electric—The Influence of Body Proportions on Perceived Gender of Robots across Cultures. *Robotics*, *7*(3). https://doi.org/10.3390/robotics7030050

Conference Papers

Paredes, R., Cabral, J., & Seriès, P. Scikit-NeuroMSI: a Python framework for multisensory integration modelling. In: *IX Congreso de Matemática Aplicada, Computacional e Industrial*. *9*. 2023, 545–548.

Arce, D., Gibaja, S., Urbina, F., Maura, C., Huanca, D., **Paredes**, R., Cuellar, F., & Pérez-Zuniga, G. Design and preliminary validation of social assistive humanoid robot with gesture expression features for mental health treatment of isolated patients in hospitals. In: *Social Robotics: 14th International Conference, ICSR 2022, Florence, Italy, December 13–16, 2022, Proceedings, Part II*. Springer. 2023, 518–528.

Paredes, R., & Seriès, P. Influence of E/I balance in peri-personal space differences in schizophrenia and autism: a neural network approach. In: *Bernstein Conference 2021*. 2021. https://doi.org/10.12751/nncn.bc2021.p028.

Trovato, G., **Paredes**, R., Balvin, J., Cuellar, F., Thomsen, N. B., Bech, S., & Tan, Z.-H. The Sound or Silence: Investigating the Influence of Robot Noise on Proxemics. In: *2018 27th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*. 2018, 713–718. https://doi.org/10.1109/ROMAN.2018.8525795.

Abarca, M., Saito, C., Cerna, J., **Paredes**, R., & Cuéllar, F. An interdisciplinary unmanned aerial vehicles course with practical applications. In: *2017 IEEE Global Engineering Education Conference (EDUCON)*. 2017, 255–261. https://doi.org/10.1109/EDUCON.2017.7942856.

Lopez, A., Ccasane, B., **Paredes**, R., & Cuellar, F. Effects of using indirect language by a robot to change human attitudes. In: *Proceedings of the companion of the 2017 ACM/IEEE international conference on human-robot interaction*. 2017, 193–194. https://doi.org/10.1145/3029798.3038310.

Paredes, R., Laurel, C., Cuellar, F., & Davila, A. Implementation of Synchronization Triggers in an open-source EEG system for Visual Evoked Potentials measurement. In: *SAN2016 Meeting*. 2016. https://doi.org/10.3389/conf.fnhum.2016.220.00007.

Caceres, P. C., **Venero**, R. P., & Cordova, F. C. Tangible programming mechatronic interface for basic induction in programming. In: *2018 IEEE Global Engineering Education Conference (EDUCON)*. 2018, 183–190. https://doi.org/10.1109/EDUCON.2018.8363226.

Trovato, G., Lopez, A., **Paredes**, R., & Cuellar, F. Security and guidance: Two roles for a humanoid robot in an interaction experiment. In: *2017 26th IEEE International Symposium on Robot and Human Interactive Communication* (*RO-MAN*). 2017, 230–235. https://doi.org/10.1109/ROMAN.2017.8172307.

Lopez, A., **Paredes**, R., Quiroz, D., Trovato, G., & Cuellar, F. Robotman: A security robot for human-robot interaction. In: *2017 18th International Conference on Advanced Robotics* (*ICAR*). 2017, 7–12. https://doi.org/10.1109/ICAR.2017.8023489.

Book Chapters

Paredes Venero, R., & Davila, A. (2020). Experimental Research Methodology and Statistics Insights. In C. Jost, B. Le Pévédic, T. Belpaeme, C. Bethel, D. Chrysostomou, N. Crook, M. Grandgeorge, & N. Mirnig (Eds.), *Human-Robot Interaction: Evaluation Methods and Their Standardization* (pp. 333–353). Springer, Cham. https://doi.org/10.1007/978-3-030-42307-0_13