Ramiro Plüss

Argentine rpluss@itba.edu.ar Google Scholar LinkedIn GitHub

About Me

Physicist and PhD candidate at ITBA, working on computational and robotic models of proprioception. My research explores how neural dynamics and connectome-based architectures give rise to cognition, embodied motor control, and emergent behavior, using interdisciplinary tools at the intersection of neuroscience, robotics, and complex systems.

Education

Buenos Aires Institute of Technology (ITBA) – CABA, Argentina July 2023 — Present

- **PhD in Engineering** *(in progress)*
- *PhD Thesis: "Computational and Robotic Models for Proprioception"*
- Supervisor: Dr. Pablo Martín Gleiser

National University of Rosario (UNR - FCEIA) – Rosario, Argentina February 2016 — March 2023

- **Undergraduate Degree in Physics** *(Licenciatura en Física, 9-semester program)* **GPA:** 7.76/10
- *Undergraduate thesis:* "*Dynamics and Structure in Adaptive Neural Networks*", UNR Rephip
- Supervisor: Dr. Pablo Martín Gleiser
- **University Bachelor's in Exact Sciences** *(Bachiller Universitario en Ciencias Exactas)* **GPA:** 7.33/10

Publications

The Role of Connection Density in Adaptive Networks with Chaotic Units

Ramiro Plüss, Pablo Martín Gleiser

We study how connection density shapes the emergence of cluster synchronization and structural properties such as integration and segregation in adaptive networks composed of chaotic units. *ArXiv preprint* arXiv:2505.11437v3

Hemispheric-Specific Coupling Improves Modeling of Functional Connectivity Using Wilson–Cowan Dynamics

Ramiro Plüss, Hernán Villota, Patricio Orio

We introduce a a new hemispheric-specific coupling scheme into the Wilson–Cowan neural mass model to simulate resting-state functional connectivity. *ArXiv preprint* arXiv:2506.22951v2

Poster Presentations in Conferences and International Schools

Modeling Functional Connectivity Alterations in Schizophrenia Patients from the Structural Connectome (with Hernán Villota, Tomás Bosch, and Patricio Orio). Presented at XIV National Congress and XV International Seminar of Neurosciences, Bogotá, Colombia (April 2025).

Phase Transition in an Adaptive Network with Chaotic Units (with Pablo Gleiser). Presented at several international schools and conferences: School on the Origins of Life, Behavior and Cognition – ICTP-SAIFR, São Paulo, Brazil (March 2025); School on Synchronization: from Collective Motion to Brain Dynamics – ICTP-SAIFR, São Paulo, Brazil (February 2025); IRCN/Chen Institute Joint Course on Neuro-inspired Computation – University of Tokyo, Japan (July 2024); RAFA 108 – Bahía Blanca, Argentina (September 2023); RAFA 107 – Bariloche, Argentina (September 2022); Science, Technology and Innovation Conference – Rosario, Argentina (October 2022).

Preliminary Study of the Viscoelastic Properties of Red Blood Cells Irradiated with Gamma Radiation Using a Rheometer (with F. Gómez Fava et al.). Presented at: RAFA 107 – Bariloche, Argentina (September 2022); Science, Technology and Innovation Conference – Rosario, Argentina (October 2022).

Relevant programs and courses

School on the Origins of Life, Behavior and Cognition, ICTP-SAIFR, Brazil — March 2025
School on Synchronization: from Collective Motion to Brain Dynamics, ICTP-SAIFR, Brazil — February 2025
Latin American Summer School of Computational Neuroscience, University of Valparaíso, Chile — January 2025
Artificial Intelligence Systems, ITBA, Argentina — August–November 2024
Complex Networks, ITBA, Argentina — August–November 2024
Modeling and Analysis of Complex Systems, University of Buenos Aires, Argentina — July 2024
IRCN/Chen Institute Joint Course on Neuro-inspired Computation, University of Tokyo, Japan — July 2024
Neuroscience and Productive Development, ITBA, Argentina — March–June 2024
Latin American School of Computational Neuroscience, University of São Paulo, Brazil — January 2024
Bioinspired Robotics, ITBA, Argentina — August–December 2023
Introduction to Medical and Biomedical Physics, UNR, Argentina — October–December 2019

Invited Talks

Invited speaker August 2025

International Congress INNOVA GISS 2025: Management of Social and Sustainable Research. Workshop 2025. Envigado, Colombia. August 2025.

Teaching experience

Teaching Assistant at ITBA September 2024 - Present

Assisted students in programming perceptron-based robots using Arduino for interaction with the environment and other robots in the Bioinspired Robotics course at ITBA.

Private Tutor 2020 - 2024

Dedicated self-employed educator offering specialized classes in physics, mathematics, and chemistry to high school and university students.

Scholarships

CONICET Ph.D. Scholarship 2022 – Present

Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET Buenos Aires, Argentina.
Director: Pablo Martín Gleiser
Topic: Computational and robotic models to study proprioception.
Workplace: ITBA Sede Rectorado. Iguazú 341, C1437 CABA, Argentina.

Manuel Belgrano Scholarship 2022 - 2023

The Manuel Belgrano Strategic Scholarship Program is a scholarship system to promote access, retention, and completion of undergraduate and graduate studies in nine areas of public policy considered key to the country's economic development and social equality.

Industry Experience

Capital Market Operator October 2022 – December 2022

Rosental Inversiones, Rosario, Santa Fe, Argentina

Worked in the capital markets division of Rosental Inversiones, a leading company in financial advising and stock market operations for both corporate and individual clients. During this period, I applied analytical tools to real-world financial contexts, including small-scale projects such as web scraping. This experience reinforced my interest in developing a stronger scientific and technical foundation, which I decided to pursue through a PhD starting in 2023.

Volunteering

ITBA Future Day June 2025

Presented the goals of the course and its interdisciplinary approach connecting neuroscience, biology, and robotics.

Oatec event helper October 2023

The Argentine Technology Olympiad (OATec) is an activity whose fundamental objectives are: Awakening scientific-technological vocations in young high school students.

Scientific communication project September 2022

Participation as a photographer in a Science Communication Project of the Physical Management of the Bariloche Atomic Center of the National Atomic Energy Commission.

Technical Skills

Programming languages: Python, Fortran (Proficient), Arduino.

Software/Packages: LaTeX, Qtiplot, Microsoft Office, Adobe Ligthroom, Adobe Photoshop, Windows, Linux.

Hardware: Arduino, Raspberry pi, Maker skills.

Languages: Spanish (Native), English (English: B2 – Upper Intermediate, improving for academic writing and presentations).