

Ramiro Plüss

Physicist | PhD Candidate in Engineering | Computational Neuroscience, Connectomics & Bio-inspired Robotics

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About Me

My research focuses on the bidirectional relationship between network structure, neural dynamics, and behavior, combining computational neuroscience, network models, and bio-inspired robotics to study proprioception and embodied control. I build bio-inspired robotic testbeds to study embodied motor control with computational neuroscience models.

Education

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

PhD in Engineering (in progress). Thesis: “Computational and Robotic Models for Proprioception.”

National University of Rosario (UNR–FCELA), Rosario, Argentina Feb 2016 – Mar 2023

Licentiate in Physics (5-year program). Thesis: “Dynamics and Structure in Adaptive Neural Networks.”

Thesis repository (in Spanish): [UNR institutional repository](#).

Publications and Preprints

- **Ramiro Plüss**, Hernán Villota, Patricio Orio, “Hemispheric-Specific Coupling Improves Modeling of Functional Connectivity Using Wilson–Cowan Dynamics,” in *Computational Neuroscience (LAWCN 2025)*, A. Talevi and V. Rosa Cota (eds.), CCIS, vol. 2734, pp. 109–121, Springer, Cham (2026). DOI: [10.1007/978-3-032-14664-9_10](#). *arXiv*: [2506.22951](#) (available since 28 June 2025).
- **Ramiro Plüss**, Pablo Martín Gleiser, “The Role of Connection Density in Adaptive Networks with Chaotic Units,” *arXiv*: [2505.11437](#) (2025).

Research Projects

- **Whole-brain WC/DMF modeling: hemispheric coupling for multi-scale SC–FC** Dec 2025 – Present
ITBA (Argentina), IUE (Colombia), UV/CINV (Chile). Benchmarking global vs. hemispheric-specific coupling across parcellation scales and SC variability.
- **Hexapod robotic testbed** Mar 2025 – Present
developing and extending an existing hexapod platform to implement *Drosophila* connectome-informed motor controllers for embodied locomotion studies.
- **Animatronic platform testbed** Mar 2025 – Present
developing and extending an existing animatronic platform with vision and natural-language interaction capabilities.
- **UNR–CRH linkage project (IFIR, UNR–CONICET)** Aug 2021 – Oct 2022
Experimental hemorheology study of gamma-irradiated human red blood cells using laser diffractometry (erythrocyte rheometer) to estimate viscoelastic and membrane parameters.

Invited Talks

- Young Scholar Speaker, “Hemispheric-Specific Coupling Improves Modeling of Functional Connectivity Using Wilson–Cowan Dynamics.” V Latin American Workshop on Computational Neuroscience (LAWCN’25), Universidad Nacional de La Plata (UNLP), La Plata, Argentina, Nov 2025.
- Invited Speaker, “Why Complex Networks?” International Congress INNOVA GISS 2025: Management of Social and Sustainable Research, Institución Universitaria de Envigado (IUE), Envigado, Colombia, Aug 2025.

Poster Presentations in Conferences and International Schools

- **Ramiro Plüss**, Hernán Villota, Patricio Orio, “Hemispheric-Specific Coupling Improves Modeling of Functional Connectivity Using Wilson–Cowan Dynamics.” V Latin American Workshop on Computational Neuroscience (LAWCN’25), Universidad Nacional de La Plata (UNLP), La Plata, Argentina, Nov 2025.
- **Ramiro Plüss**, Hernán Villota, Tomás Bosch, Patricio Orio, “Modeling Functional Connectivity Alterations in Schizophrenia Patients from the Structural Connectome.” XIV National Congress and XV International Seminar of Neurosciences, Bogotá, Colombia, Apr 2025.
- **Ramiro Plüss**, Pablo Martín Gleiser, “Phase Transition in an Adaptive Network with Chaotic Units.” School on the Origins of Life, Behavior and Cognition, ICTP-SAIFR, São Paulo, Brazil, Mar 2025; School on Synchronization: from Collective Motion to Brain Dynamics, ICTP-SAIFR, São Paulo, Brazil, Feb 2025; IRCN/Chen Institute Joint Course on Neuro-inspired Computation, University of Tokyo, Japan, Jul 2024; RAFA 108, Bahía Blanca, Argentina, Sep 2023; RAFA 107, Bariloche, Argentina, Sep 2022; Science, Technology and Innovation Conference, Rosario, Argentina, Oct 2022.
- Florencia Gómez Fava, **Ramiro Plüss**, Sabrina Porini, Horacio V. Castellini, Analía I. Alet, Liliana Di Tulio, Andrea Acosta, Nestor Manzelli, Ariel Aresi, Mariel Galassi, Bibiana D. Riquelme, “Preliminary Study of the Viscoelastic Properties of Red Blood Cells Irradiated with Gamma Radiation Using a Rheometer.” RAFA 107, Bariloche, Argentina, Sep 2022; Science, Technology and Innovation Conference, Rosario, Argentina, Oct 2022.

Scholarships

CONICET Ph.D. Scholarship

Apr 2022 – Present

Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET Buenos Aires, Argentina.

Director: Pablo Martín Gleiser. *Workplace*: ITBA Sede Rectorado. Iguazú 341, C1437 CABA, Argentina.

Manuel Belgrano Scholarship

Abr 2022 – Feb 2023

Relevant Schools & Advanced Courses

Spring School on Deep Learning, UBA, CABA, Argentina	Oct 2025
School on the Origins of Life, Behavior and Cognition, ICTP-SAIFR, São Paulo, Brazil	Mar 2025
School on Synchronization: from collective motion to brain dynamics, ICTP-SAIFR, SP, Brazil	Feb 2025
Latin American Summer School of Computational Neuroscience, UV, Valparaíso, Chile	Jan 2025
Artificial Intelligence Systems, ITBA, CABA, Argentina	Aug – Nov 2024
Complex Networks, ITBA, CABA, Argentina	Aug – Nov 2024
Modeling and Analysis of Complex Systems, UBA, CABA Argentina	Jul 2024
IRCN/Chen Institute Joint Course on Neuro-inspired Computation, UT, Tokyo, Japan	Jul 2024
Neuroscience and Productive Development, ITBA, CABA, Argentina	Mar – Jun 2024
Latin American School of Computational Neuroscience, USP, São Paulo, Brazil	Jan 2024
Bioinspired Robotics, ITBA, CABA, Argentina	Aug – Dec 2023
<i>Course on Radionuclides and Applications</i> , UNR, Rosario, Argentina	Oct – Nov 2020
<i>Introduction to Medical and Biomedical Physics</i> , UNR, Rosario, Argentina	Oct – Dec 2019

Teaching Experience

Teaching Assistant, ITBA — Bioinspired Robotics course.	Sep 2024 – Present
Private Tutor — Physics, mathematics, and chemistry for high-school and university students.	2020 – 2024

Technical Skills & Languages

Programming: Python, Fortran, Arduino (C/C++ for microcontrollers).
Software/Packages: \LaTeX , NumPy/SciPy, Numba, NetworkX, Matplotlib, Git.
Hardware: Arduino-based systems, Raspberry Pi, basic maker skills (prototyping, electronics).
Languages: Spanish (native), English (B2, professional working proficiency).

Volunteering

MiniLabs ITBA – Bio-inspired robotics demos for prospective high-school students.	Feb 2026
Goethe Schule outreach activity – Robotics demos for visiting high-school students.	Nov 2025
Donor Appreciation Gathering – Bio-inspired robotics demos for institutional donors.	Nov 2025
ITBA Future Day – Presented the <i>Bioinspired Robotics</i> course to prospective students.	Jun 2025
OATec – Event support and STEM outreach during the Argentine Technology Olympiad.	Oct 2023
Scientific communication project – Photographer, CAB–CNEA.	Sep 2022

Industry Experience

Capital Market Operator at Rosental Inversiones, Rosario, Argentina	Oct – Dec 2022
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