

Juan E. Sereno Mesa

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Education

2018–2024	Ph.D. Mathematical Engineering	Universidad Nacional del Litoral, ARG <i>Advisor:</i> Alejandro Hernán González
2017–2021	M.Sc. Industrial Automation	Universidad Nacional de Colombia, COL <i>Advisor:</i> P. S. Rivadeneira
2013–2017	B.E. Control Engineering	Universidad Nacional de Colombia, COL <i>Advisor:</i> P. S. Rivadeneira

Academic positions

2024–	Postdoctoral Research Fellow , Dept. of Mathematics and Statistical Science University of Idaho, Moscow, ID. Supervised by Prof. Esteban Hernandez-Vargas.
Service	
2025–	Co-chair , Post-doctoral and Researchers Association University of Idaho, Moscow, ID.

Research Projects

2022–2024	PICT, Nro. 2021-I-A-00544. PI: A.H. González. Amount: ARS \$6,000,000. Mathematical modeling and control of tuberculosis in Argentina. My Role: Doctoral Student.
2021–2024	PIP, Nro. 112-2020010-2555-CO. PI: A.H. González. Amount: ARS \$1,510,000. Mathematical modeling and control of the COVID-19 pandemic in Argentina. My Role: Doctoral Student.
2019–2024	PICT, Nro. 2019-01794. PI: A.H. González. Amount: ARS \$1,063,125. Design of economic model predictive control (EMPC) strategies for tracking time-varying trajectories and paths in the presence of obstacles. My Role: Doctoral Student.

Honors and awards

2018 Doctoral Internal Scholarship, National Council of Scientific and Technical Research (CONICET), Buenos Aires, Argentina.

2017 First Place in the Area of Appropriate Technologies, National Competition of Best Final Degree Projects Otto de Greiff, 21st edition, Bogotá, Colombia.

2017 Best Final Degree Project, Universidad Nacional de Colombia, Medellín, Colombia.

Publications

Articles (8 total, 6 first authorship)

8. **Sereno, J. E.**, Neujahr, H., Hernandez-Gonzalez, M., & Hernandez-Vargas, E. A. (2025). Iterative calibration of medical digital twins via adaptive estimators. *Frontiers in Applied Mathematics and Statistics*, 11, 1699390.
7. **Sereno, J. E.**, D'Jorge, A., Hernandez-Vargas, E. A., & González, A. H. (2025). Time-Constrained MPC Approach for Switched Nonlinear Systems With Applications to Biomedical Problems. *IEEE Control Systems Letters*, 9, 949–954.
6. **Sereno, J. E.**, D'Jorge, A., Ferramosca, A., Hernandez-Vargas, E. A., & González, A. H. (2023). Switched NMPC for epidemiological and social-economic control objectives in SIR-type systems. *Annual Reviews in Control*, 56, 100901.
5. **Sereno, J.**, Ferramosca, A., González, A., & D'Jorge, A. (2023). Impacts of Quantifying Social Distancing Measures on MPC Performance for SIR-Type Systems. *Latin American Applied Research*, 53(4), 417–422.
4. **Sereno, J.**, Anderson, A., Ferramosca, A., Hernandez-Vargas, E. A., & González, A. H. (2022). Minimizing the epidemic final size while containing the infected peak prevalence in SIR systems. *Automatica*, 144, 110496.
3. Godoy, J. L., **Sereno, J. E.**, & Rivadeneira, P. S. (2021). Meal detection and carbohydrate estimation based on a feedback scheme with application to the artificial pancreas. *Biomedical Signal Processing and Control*, 68, 102715.
2. Rivadeneira, P. S., **Sereno, J. E.**, Caicedo, M. A. (2019). Nuevas estrategias de control glucémico en pacientes con diabetes mellitus tipo 1. *Revista Iberoamericana de Automática e Informática Industrial*, 16(2), 238–248.
1. **Sereno, J. E.**, Caicedo, M. A., Rivadeneira, P. S. (2018). Artificial pancreas: glycemic control strategies for avoiding hypoglycemia. *Dyna*, 85(207), 198–207.

Book chapters

- Rivadeneira, P. S., Godoy, J. L., **Sereno, J. E.**, Abuin, P., Ferramosca, A., González, A. H. (2020). Impulsive MPC schemes for biomedical processes: Application to type 1 diabetes. In *Control Applications for Biomedical Engineering Systems* (pp. 55–87). Academic Press.

Research presentations

Invited oral presentations

- “Adaptive Observers for Medical Digital Twins: A Framework for Personalized Medicine” University of Idaho, Department of Mathematics and Statistical Science Colloquium, February 2026.
- “Understanding SIR-type epidemic behaviors through set-based dynamic analysis” University of Idaho, Department of Mathematics and Statistical Science Colloquium, October 2024.
- “Desempeño del controlador predictivo basado en modelo bajo diferentes niveles de medidas de distanciamiento social para el control epidemiológico en modelos tipo SIR” INTEC-CONICET, Dr. Alberto Cassano Seminar, June 2023.

Conference abstracts (*presenting author underlined*)

12. Sereno, Juan, & Hernandez-Vargas, E. A. (2026). Parameter Inference in Immune Digital Twins: A Stochastic Adaptive Filtering Approach. *The Western North American Region of The International Biometric Society*. Pullman, Washington, United States.
11. Rodríguez-Liñan, A., Sereno, J. E., Quiroz-Compean, G., & Hernandez-Vargas, E. A. (2025). Adaptive Observers for Calibrating Immune Digital Twins in Viral Infections. *64th IEEE Conference on Decision and Control*. Rio de Janeiro, Brazil.
10. Sereno, J. E., D’Jorge, A., Ferramosca, A., Hernandez-Vargas, E. A., & González, A. H. (2021). Model predictive control for optimal social distancing in a type SIR-switched model. *11th IFAC Symposium on Biological and Medical Systems*. Ghent, Belgium.
9. Abuin, P., Sereno, J. E., Ferramosca, A., & Gonzalez, A. H. (2020). Closed-loop MPC-based artificial pancreas: Handling circadian variability of insulin sensitivity. *Congreso Argentino en Control Automático (AADECA 2020)*. Buenos Aires, Argentina.
8. Rivadeneira, P. S., Caicedo, M. A., **Sereno, J. E.** (2018). A new Approach in Zone Model Predictive Control for Type 1 Diabetes to be Tested in Colombia. *Diabetes Technology & Therapeutics*, Vol. 20, pp. A86–A87. Vienna, Austria.
7. Sereno, J. E., Caicedo, M. A., Rivadeneira, P. S., & Camacho, O. E. (2018). In Silico Test for MPC and SMC Controllers Under Parametric Variations in Type 1 Diabetic Patients. *Congreso Argentino en Control Automático (AADECA 2018)*. Buenos Aires, Argentina.
6. Sereno, J. E., & Rivadeneira, P. S. (2018). Auto-tuning for model predictive controllers in patients with type 1 diabetes. *Congreso Argentino en Control Automático (AADECA 2018)*. Buenos Aires, Argentina.
5. Rivadeneira, P. S., Sereno, J. E., Magdelaine, N., Moog, C. H. (2017). Blood glycemia reconstruction from discrete measurements using an impulsive observer. *20th IFAC World Congress*. Toulouse, France.
4. Sereno, J. E., González, A. H., & Rivadeneira, P. S. (2017). A performance comparison between standard and impulsive ZMPC on type 1 diabetic patients. *2017 IEEE 3rd Colombian Conference on Automatic Control (CCAC)*, pp. 1–6. IEEE.
3. Sereno, J. E., Bolaños, F., Vallejo, M. (2016). Artificial vision system for differential multiples robots. *2016 Technologies Applied to Electronics Teaching (TAE)*, pp. 1–5. IEEE, Sevilla, Spain.
2. Mohammadridha, T., Rivadeneira, P. S., Sereno, J. E., Cardelli, M., Moog, C. H. (2016). Description of the positively invariant sets of a type 1 diabetic patient model. *2016 Latin American Conference on Automatic Control (CLCA)*. IFAC, Medellín, Colombia.
1. Sereno, J., Arango-Zuluaga, E. I., & Bolaños, F. (2014). Propuesta pedagógica para el desarrollo de un curso en robótica básica. *III International Congress of Engineering Mechatronics and Automation*. Cartagena, Colombia.

Citation metrics

Scopus Author Search Page (Excluding self-citations): 17 Documents, 76 Citations, 5 h-index.

Teaching

Teaching Assistant, Universidad Nacional del Litoral, Santa Fe, Argentina

–Model Predictive Control, School of Chemical Engineering, 2021. *Responsibilities*: Conducted tutorials and assisted undergraduate and graduate students with course content. Teaching model predictive control theory. *Learning goals*: Students will gain proficiency in the theoretical aspects and the practical

implementation of the model predictive control strategy, including handling uncertainty and robust control strategies.

Teaching Assistant, Universidad Nacional del Litoral, Santa Fe, Argentina

–Mathematics A, Mathematics Department, School of Chemical Engineering, 2022–2024. *Responsibilities:* Conducted tutorials and assisted undergraduate engineering students with course content. Teaching introductory university mathematics. *Learning goals:* Students will gain proficiency in the basic concepts and tools of linear algebra related to systems of linear equations, as well as in the calculus of one variable that pertains to the study of functions.

Teaching Assistant, Universidad Nacional de Colombia, Medellín, Colombia

–Analog Electronics II, Department of Electrical Energy and Automation, School of Mines, 2014–2015. *Responsibilities:* Assisted undergraduate students in laboratory sessions and lecture support for analog electronics coursework. *Learning goals:* Students will gain proficiency in the advanced analysis and design of analog electronic systems, specializing in operational amplifier applications, active filters, and power circuits.

Mentoring

INTEC-CONICET, Santa Fe, Argentina

2024 **Jocelyn Leung**. Texas A&M undergraduate. Helped with coding and performing dynamical analysis of the COVID-19 pandemic during her research internship at the INTEC institute.

Ad hoc referee

Control Theory: IEEE Control Systems Letters, Optimal Control Applications and Methods, Franklin Open, IEEE Conference on Decision and Control, American Control Conference, and The IEEE Latin American Robotics Symposium.

Professional membership

2026- SMB Society of Mathematical Biology.

2025- NPA National Postdoctoral Association.

Computational fluency

Matlab, Python, CasADi, YALMIP, VS Code, $\text{\LaTeX}$, HTML, CSS.

Languages proficiency

- **Spanish:** Native.
- **English:** Professional Working Proficiency. TOEFL iBT Score: 88 (CEFR Level: B2). Test Date: January 18, 2026.