Angel **Lareo**

Computer Science Engineer // Predoctoral Researcher

Biological Neurocomputation Group (GNB)

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Journal publications

- A. Lareo, P. Varona, and F. B. Rodriguez, "Modeling the sequential pattern variability of the electromotor command system of pulse electric fish," *Frontiers in Neuroinformatics*, vol. 16, p. 64, 2022, ISSN: 1662-5196. DOI: 10.3389/fninf.2022.912654
- M. Lallana, A. Almazán, A. Valero, and Á. Lareo, "Assessing energy descent scenarios for the ecological transition in spain 2020–2030," *Sustainability*, vol. 13, no. 21, p. 11 867, 2021. DOI: 10.3390/su132111867
- M. Leo, A. Lareo, C. García Saura, J. Hortal, and N. G. Medina, "BtM, a low-cost open-source datalogger to estimate the water content of nonvascular cryptogams," 2019. DOI: 10.3791/58700
- A. Lareo, C. G. Forlim, R. D. Pinto, P. Varona, and F. Rodriguez, "Temporal Code-Driven Stimulation: Definition and Application to Electric Fish Signaling," *Frontiers in Neuroinformatics*, vol. 10, p. 41, 2016. DOI: 10.3389/fninf.2016.00041

Preprint publications

- A. Lareo, P. Varona, and F. B. Rodriguez, "Modeling the variability of the electromotor command system of pulse electric fish," *bioRxiv*, pp. 2020–06, 2021. DOI: 10.1101/2020.06.09.142083

Conference papers

- A. Lareo, P. Varona, and F. B. Rodriguez, "Evolutionary Tuning of a Pulse Mormyrid Electromotor Model to Generate Stereotyped Sequences of Electrical Pulse Intervals," in *ICANN 2018, 27th International Conference on Artificial Neural Networks*, V. Kůrková, Y. Manolopoulos, B. Hammer, L. Iliadis, and I. Maglogiannis, Eds., Springer, Rhodes, Greece: Springer International Publishing, 2018, pp. 359–368, ISBN: 978-3-030-01421-6. DOI: 10.1007/978-3-030-01421-6_35
- A. Lareo, C. G. Forlim, R. D. Pinto, P. Varona, and F. B. Rodriguez, "Analysis of Electroreception with Temporal Code-Driven Stimulation," in *Lecture Notes in Computer Science*, vol. 10305, Cadiz, Spain: Springer, 2017, pp. 101–111. DOI: 10.1007/978-3-319-59153-7_9

Conference abstract publications

- A. Lareo, P. Varona, and F. B. Rodriguez, "Assessing the electromotor neural network's topology through modeling and genetic algorithm optimization," in *CNS 2022, 31th Annual Computational Neuroscience Meeting, July 16 to 20*, 2022. To be published in *Journal of Computational Neuroscience*.
- A. Ayala, A. Lareo, P. Varona, and F. B. Rodriguez, "Closed-loop stimulation protocol driven by flexible neural codes based on victor-purpura distance," in *CNS 2022, 31th Annual Computational Neuroscience Meeting, July 16 to 20*, 2022. To be published in *Journal of Computational Neuroscience*.
- A. Ayala, A. Lareo, P. Varona, and F. B. Rodriguez, "Closed-loop temporal code-driven stimulation implemented and tested using real-time experimental interface (RTXI)," in *CNS 2021, 30th Annual Computational Neuroscience Meeting, July 3 to 7*, vol. 49 (Suppl 1), Online, 2021, S155–S156. DOI: 10.1007/s10827-021-00801-9
- A. Lareo, A. Ayala, P. Varona, and F. B. Rodriguez, "Closed-loop stimulation guided by minimal codes in the sequential activity of weakly electric fish," in *CNS 2021, 30th Annual Computational Neuroscience Meeting, July 3 to 7*, vol. 49 (Suppl 1), Online, 2021, S154–S155. DOI: 10.1007/s10827-021-00801-9

- L. Moreno, A. Lareo, and N. G. Medina, "The importance of moss shoot and colony traits on their desiccation dynamics," in *The Bryological Times*, vol. 152, 2021, p. 52
- A. Lareo, P. Varona, and F. B. Rodriguez, "Tuning a computational model of the electromotor system to patterns of interpulse intervals recorded from Gnathonemus petersii specimens," in *CNS 2019, 28th Annual Computational Neuroscience Meeting, 13-17 July 2019*, vol. 20 (Suppl 1), Barcelona, Spain: BMC Neuroscience, 2019, p. 263. DOI: 10.1186/s12868-019-0538-0
- C. G. Forlim, L. de Almeida, A. Lareo, R. D. Pinto, P. Varona, and F. B. Rodriguez, "Closed-loop temporally structured light stimulation in weakly electric fish," in *CNS 2017, 26th Annual Computational Neuroscience Meeting, July 15-20*, vol. 18 (Suppl 1), Antwerpen, Belgium: BMC Neuroscience, 2017, p. 223. DOI: 10.1186/s12868-017-0372-1
- A. Lareo, C. G. Forlim, R. D. Pinto, P. Varona, and F. B. Rodriguez, "Information-theoretic analysis of temporal code-driven stimulation applied to electroreception," in *CNS 2017, 26th Annual Computational Neuroscience Meeting, July 15-20*, vol. 18 (Suppl 1), Antwerpen, Belgium: BMC Neuroscience, 2017, p. 224. DOI: 10.1186/s12868-017-0372-1
- A. Lareo and F. B. Rodriguez, "Sequential Information Processing in Electroreception: A Modelling Approach," in *Dynamic Days in Latin America and the Caribbean. Puebla. México.*, Puebla. México., 2016
- A. Lareo, "Weakly electric fish information processing analyzed through close-loop code-driven stimulation.," in *10th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, ser. Special Session 77: Theoretical, Technical, and Experimental Challenges in Closed-Loop Approaches in Biology, Madrid, Spain, 2014

Teaching

Master's Dissertation — *Universidad Autónoma de Madrid*

Co-director — *Oct. 2022*

- A. Ayala, "Ciclo cerrado para la búsqueda y estudio de códigos de actividad temporal neuronal a través de protocolos de estimulación en tiempo real con métricas de detección flexibles," Master's thesis, 2022

Bachelor Degree Dissertation — *Universidad Autónoma de Madrid*

Co-director — *Jul. 2021*

- L. Moreno, *Relación de la morfología de las colonias de musgos con sus dinámicas de desecación.* 2021

Bachelor Degree Dissertation — *Universidad Autónoma de Madrid*

Co-director — *Sept. 2020*

- A. Ayala, *Estudio y desarrollo de una herramienta en tiempo real para estimulación bidireccional dirigida por codificación temporal en el contexto de peces eléctricos.* 2020

Algorithm Analysis — *Universidad Autónoma de Madrid*

Assistant teacher — *Oct. 2017 - Jan. 2018*

Operating Systems I — *Universidad Autónoma de Madrid*

Assistant teacher — *Feb. 2021 - May 2021*

Research projects

Incorporation of natural information processing principles in the design of artificial computing algorithms. — *Madrid, Spain*

Predoctoral researcher — *Jan. 2021 - Dec. 2023*

- Spanish Ministry of Science an Innovation MICINN PID2020-114867RB-I00.
- PI: Prof. Francisco B. Rodriguez.
- Computational model of the electromotor command network.

Scaling the effects of niche and ecological interactions on species coexistence. — *Madrid, Spain*

Predoctoral researcher — *Jan. 2019 - Now*

- Spanish Ministry of Science an Innovation PID2019-106840GA-C22.
- PI: Prof. Nagore García Medina
- Design and implementation of an humidity and temperature datalogger.

One year to apply the Paris agreement. Biodiversity Foundation (MITRD) Grant Aid. *Madrid, Spain*

COMPUTER SCIENCE ENGINEER *Sept. 2019 - Dic. 2019*

- Beneficiary: Ecologistas en Acción
- Define public policies related with Paris Agreement.
- Report Work scenarios in the ecosocial transition (2020-2030)

Dynamic interaction between natural computing systems and artificial systems *Madrid, Spain*

PREDOCTORAL RESEARCHER *Jan. 2018 - Dec. 2020*

- Spanish Ministry of Economy, Industry, and Competitiveness MINECO TIN2017-84452-R.
- PI: Prof. Francisco B. Rodriguez.
- Research using Temporal Code-Driven Stimulation.

Research Stay at Computational Sciences Department. Monterrey Institute of Technology and Higher Education (ITESM) *Puebla, Mexico*

PREDOCTORAL RESEARCHER *Aug. 2016 - May. 2017*

- Tutor: Prof. Alberto Oliart

Study and analysis of dynamic information processing in natural and bio-inspired computer systems. *Madrid, Spain*

PREDOCTORAL RESEARCHER *Jan. 2015 - Dec. 2018*

- Spanish Spanish Ministry of Economy and Competitiveness MINECO TIN2014-54580-R.
- IP: Prof. Francisco B. Rodriguez.
- Implementation of closed-loop code-driven stimulation using ADClamp.

Grants and Scholarships

YEI Grant Predoctoral Researchers 2016 *Madrid, Spain*

PREDOCTORAL RESEARCHER *Apr. 2017 - Apr. 2018*

- Community of Madrid PEJD-2016/TIC-2633

Research Stay at Computational Sciences Department. Monterrey Institute of Technology and Higher Education (ITESM) *Puebla, Mexico*

PREDOCTORAL RESEARCHER *Aug. 2016 - Apr. 2017*

- Tutor: Prof. Alberto Oliart
- *Becas Iberoamérica Jóvenes Profesores e Investigadores 2016* International Research Grant
- Project: Neural model of electrical discharge in fish electricians of the species *Gnathonemus petersii*.

Grant of the Department of Computer Engineering EPS-UAM (2015) for the start of doctoral studies. *Madrid, Spain*

M.S. *Oct. 2015 - Jun. 2017*

- Doctorate in Computer Engineering and Telecommunications (RD2011) at Biological Neurocomputation Group (GNB).

Grant of the Department of Computer Engineering EPS-UAM (2013) for Master's Degree Enrollment. *Madrid, Spain*

B.E. *Oct. 2013 - Oct. 2014*

- (Master's program in Research and Innovation in Information and Communications Technologies (I2-TIC) at Biological Neurocomputation Group (GNB)..)

Professional experience

Biten Technology SL *Madrid, Spain*

FULL-STACK DEVELOPER & SYSADMIN *Feb. 2019 - Now*

- Full-stack developer & sysadmin OpenEdX massive online courses platforms.

Autonomous University Madrid Foundation (FUAM) *Madrid, Spain*

WEB DEVELOPER *Sept. 2018 - Mar. 2019*

- Web development of the Employment Observatory of the UAM.

Autonomous University Madrid (UAM) *Madrid, Spain*

SOFTWARE ENGINEER *Sept. 2015 - Jul. 2016*

- Full-stack developer & sysadmin OpenEdX massive online courses platform at the Universidad Autónoma de Madrid.

Others

BrainCode Games Hackathon

https://thebraincodegames.github.io/

Participant - 6th position

Nov. 2021

- A hackaton about applying AI and ML methods to solve a neuroscientific problem.

3 Minutes Thesis Contest

Madrid, España

Winner ITC Branch at UAM Madrid

May 2017

- Winner of the ITC branch at Universidad Autónoma de Madrid.
- 2nd place at regional final.

Postgraduate course: Intelligent Systems

Puebla, Mexico

Student

Aug. 2016 - Nov. 2016

Postgraduate course: Research and Innovation Methods

Puebla, Mexico

Student

Aug. 2016 - Nov. 2016