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EDUCATION

2013–2017 **Ph.D. Mathematics**
University of Miami (Miami, FL)
Advisor: Prof. B. De Oliveira
Thesis: Symmetric Twisted Differentials and the Quadric Algebra

2011–2013 **M.Sc. Mathematics**
University of Miami (Miami, FL)

2009–2011 **B.Sc. Mathematics**
University of Miami (Miami, FL)

PROFESSIONAL POSITIONS

2023-present **Associate Research Scholar**
Princeton University (Princeton, NJ)
Computational Neuroscience (mentor: Prof. T.A. Engel)

2019-2022 **Computational Postdoctoral Fellow**
Cold Spring Harbor Laboratory (Cold Spring Harbor, NY)
Computational Neuroscience (mentor: Prof. T.A. Engel)

2017-2019 **Postdoctoral Scholar**
Pennsylvania State University (State College, PA)
Mathematical Neuroscience (mentor: Prof. C. Curto)

2011-2017 **Teaching Assistant**
University of Miami, Mathematics Department (Miami, FL)

2014-2015 **Adjunct Lecturer**
Miami-Dade College, Mathematics Department (Miami, FL)

LARGE-SCALE COLLABORATION

2020-present **International Brain Laboratory** Postdoctoral Researcher

HONORS AND AWARDS

2024 PNI Innovation Award

2023 BRAIN Initiative Trainee Highlight Award

2021-2022 Swartz Foundation Postdoctoral Fellowship

2017 Outstanding Mathematics Graduate Student Award for excellence in research, University of Miami Mathematics Department

PUBLICATIONS

International Brain Laboratory et al., A brain-map of neural activity during complex behavior, bioRxiv 2023.07.04.547681 (2023)

C. Findling, F. Hubert, **International Brain Laboratory** et al. A brain-map of prior information in mouse during decision-making, bioRxiv 2023.07.04.547684 (2023)

C. Langdon , M. Genkin and T.A Engel ., A unifying perspective on neural manifolds and circuits for cognition, Nature Reviews Neuroscience, 24(6):363-377 (2023)

C. Langdon and T. A. Engel. Latent circuit inference from heterogeneous neural responses during cognitive tasks, bioRxiv 2022.01.23.477431, Nature Neuroscience (In revision, 2023)

Cohen Y., Engel T.A., **Langdon C.**, Lindsay G.,Ott T., Peters M., Shine J., Breton-Provencher V., and Ramaswamy S. Recent advances at the interface of neuroscience and artificial neural networks, Journal of Neuroscience, 42(45):8514-8523 (2022)

C. Curto *, **C. Langdon** and K. Morrison. Combinatorial geometry of threshold-linear networks. arXiv:2008.01032v1 (2020)

C. Curto *, **C. Langdon** and K. Morrison. Robust motifs of threshold-linear networks. arXiv:1902.10270v3 (2019)

B. De Oliveira * and **C. Langdon**, Twisted symmetric differentials and the quadric algebra of subvarieties of $\mathbb{P}^N$ of low codimension, European Journal of Mathematics, **5**, 454-475 (2018)

* Authors listed alphabetically

INVITED TALKS

- *IBL reproducibility and the brain-wide map*, UCL Neuropixels Course, London, 2023

- *Latent Circuit Inference from Heterogeneous Neural Responses during Cognitive Tasks*, SFN minisymposium on recent advances at the interface of neuroscience and artificial neural networks, San Diego, 2022
- *Latent Circuit Inference from Heterogeneous Neural Responses during Cognitive Tasks*, Swartz Foundation Meeting, Cold Spring Harbor, 2022
- *Latent Circuits in Recurrent Neural Networks*, Swartz Foundation Meeting, virtual, 2021
- *Threshold-Linear Networks and Mutations of Oriented Matroids*, AMS Special Session on Algebraic and Discrete Methods in Mathematical Biology, Auburn University, 2019
- *Combinatorial Geometry of Threshold-Linear Networks*, Mini-symposium at International Symposium on Biomathematics and Ecology Education and Research, Tempe, AZ, 2018
- *Combinatorial Geometry of Threshold-Linear Networks*, Mini-symposium at SIAM Conference on the Life Sciences, Minneapolis, 2018
- *Twisted Symmetric Differentials and the Geometry of Projective Subvarieties*, Algebraic Geometry Seminar, Courant Institute of Mathematical Sciences, 2016
- *Twisted Symmetric Differentials and the Quadric Algebra*, Geometry Seminar, University of Miami, 2016

CONFERENCE PRESENTATIONS

- *Linear manifold dimension and functional cell types* Society for Neuroscience, Chicago 2024
- *A neural circuit mechanism for context-dependent selection via population dynamics* COSYNE, Montreal 2023
- *Latent circuit inference from heterogeneous neural responses during cognitive tasks* Gordon Research Conference on the Neurobiology of Cognition, Newry, ME 2022
- *Task-relevant population dynamics in the international brain lab dataset revealed by manifold analysis* Society for Neuroscience, virtual, 2021

- *Revealing Circuit Mechanisms of Flexible Decision-Making in Recurrent Neural Network Models*, From Neuroscience to Artificially Intelligent Systems, CSHL (virtual) 2020
- *Revealing Circuit Mechanisms of Flexible Decision-Making in Recurrent Neural Network Models*, International Conference on Mathematical Neuroscience, virtual, 2020
- *Threshold-Linear Networks and Mutations of Oriented Matroids*, International Conference on Mathematical Neuroscience, Copenhagen, 2019
- *Threshold-Linear Networks and Mutations of Oriented Matroids*, HHMI Connectomics Conference, Berlin, 2019
- *Twisted Symmetric Differentials and the Geometry of Projective Subvarieties*, Algebraic Geometry Northeastern Series (AGNES), Univserity of Massachusetts Amherst 2016

TEACHING

2018	Calculus and Vector Analysis, Pennsylvania State University, Instructor
2017	Calculus with Analytic Geometry, Pennsylvania State University, Instructor
2013-2017	Calculus I, University of Miami, Instructor
2015	Math for Liberal Arts Students, Instructor
2014	Pre-Calculus, University of Miami, Instructor
2014	College Algebra, Miami-Dade College, Instructor
2013	Intermediate Algebra, University of Miami, Instructor
2012	Finite Mathematics, University of Miami, Instructor

MENTORING

2020-22 Mentor for three rotation students in Engel lab. I designed and supervised projects for graduate students doing a rotation in the Engel lab at Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.

OUTREACH

2017	Guided Explorations in Mathematics (GEM) seminar series at Mount Nittany Middle School, State College, PA.
2013-2016	Mustang Achievers Mentor at Georgia Jones-Ayers Middle School, Miami, FL