

Education

PhD in Informatics

June 2013 to May 2019

Max Planck Institute for Mathematics in the Sciences

Leipzig, Germany

- **Supervisor:** Professor Nihat Ay
- **Dissertation Submitted:** October 2017
- **Dissertation Defended:** May 2019
- **Paternity leave:** During my PhD I had my first and second child and took periods of leave for both.

Master's in Computational Neuroscience

October 2010 to May 2013

Bernstein Centre for Computational Neuroscience Berlin

Berlin, Germany

- **Supervisor:** Professor Manfred Opper

Bachelor of Science

May 2004 to May 2009

University of Toronto

Toronto, Canada

- **Specialist:** Cognitive Science and Artificial Intelligence
- **Major:** Philosophy
- **Minor:** Statistics

Bibliography

Peer-Reviewed

- Sacha Sokoloski, Amir Aschner, and Ruben Coen-Cagli, "Modelling the Neural Code in Large Populations of Correlated Neurons," ed. Jonathan W Pillow, Joshua I Gold, and Kenneth D Harris, *eLife* (2021).
- Sacha Sokoloski, "Implementing a Bayes Filter in a Neural Circuit: The Case of Unknown Stimulus Dynamics," *Neural Computation* (2017).

Preprints

- Sacha Sokoloski and Philipp Berens, "Hierarchical Mixtures of Gaussians for Combined Dimensionality Reduction and Clustering" (arXiv, 2022).
- Sacha Sokoloski, "A Biologically Realistic Model of Saccadic Eye Control with Probabilistic Population Codes," *arXiv:1210.4145 [Cs, Q-Bio]* (2012).

Theses

- Sacha Sokoloski, "Implementing Bayesian Inference with Neural Networks" (PhD thesis, University of Leipzig, 2019).
- Sacha Sokoloski, "Efficient Stochastic Control with Kullback Leibler Costs Using Kernel Methods" (Master's thesis, Technical University of Berlin, 2013).

Professional Activities

Conferences and Workshops

Population Models Workshop

July 2022

University of Edinburgh

Edinburgh, Scotland

- **Invited Talk:** Exact learning and inference in large-scale probabilistic graphical models

Cosyne

March 2022

Lisboa Congress Centre

Lisbon, Portugal

- **Poster:** Disentangling neural dynamics with fluctuating hidden Markov models (*Sacha Sokoloski, Ruben Coen-Cagli*)
- **Poster:** An interpretable spline-LNP model to characterize feedforward and feedback processing in mouse dLGN (*Lisa Schmors, Yannik Bauer, Ziwei Huang, Lukas Meyerolbersleben, Simon Renner, Ann H. Kotkat, Davide Crombie, Sacha Sokoloski, Laura Busse, Philipp Berens*)

Cosyne

February 2021

Online

- **Poster:** Information-limiting correlations linearize the neural code (*Sacha Sokoloski, Ruben Coen-Cagli*)
- **Poster:** Neural sampling from bimodal distributions in primary visual cortex (*Ruben Coen-Cagli, Adam Kohn, Sacha Sokoloski*)

Cosyne

February 2020

Hilton Denver City Center

Denver, USA

- **Poster:** Mixture of poisson models for neural correlations and coding (*Sacha Sokoloski, Ruben Coen-Cagli*)
- Received travel grant

Sense2Synapse

April 2017

Rockefeller University

New York City, USA

- **Poster:** Dynamic Bayesian Inference in the Brain

International Conference on Mathematical Neuroscience

May 2016

Antibes Juan-les-Pins Conference Centre

Juan-les-Pins, France

- **Talk:** Learning to Filter Spike Trains when the Stimulus Dynamics are Unknown and Nonlinear

HaL-10: Haskell in Leipzig

December 2015

HTWK Leipzig

Leipzig, Germany

- **Talk:** Typsichere Numerische Optimierung basierend auf Mannigfaltigkeiten
- **English title:** Typesafe Numerical Optimization based on Manifolds

Teaching and Mentorships

Teaching Essential Statistics

Winter 2022/23

University of Tübingen

- Teaching the Master's course "Essential Statistics for Neuroscience".

Google Summer of Code

Summer 2022

Haskell.org

- Mentored [Zarak Mahmud](#) through the Google Summer of Code program to add GPU computation to my [Geometric Optimization Libraries](#).

Master's Student Supervision

Winter 2021/22 & Fall 2022

University of Tübingen

- Supervised [Jure Majnik](#) on developing code for the [retinal-rl](#) project.

Google Summer of Code

Summer 2018

Haskell.org

- Mentored a student through the Google Summer of Code program on developing a library for parallel automatic differentiation for the Haskell.org organization.
- Project was overall [successful](#).

Peer Review

- Neural Processing Letters (2022)
- Nature Neuroscience (Co-review, 2022)
- eLife (2021)
- Nature Communications (Co-review, 2019)
- IEEE Transactions on Neural Networks and Learning Systems (2017)

Employment History

Professional

Postdoctoral Researcher

July 2021 to Present

University of Tübingen

Tübingen, Germany

- **Principal Investigator:** Philipp Berens
- **Project:** Modelling neural circuits in the retina

Research Fellow

October 2019 to April 2021

Albert Einstein College of Medicine

New York, USA

- **Principal Investigator:** Ruben Coen-Cagli
- **Project:** Modelling Bayesian inference in neural circuits and analyzing neural population response recordings

Research Trainee

November 2017 to September 2019

Albert Einstein College of Medicine

New York, USA

- **Principal Investigator:** Ruben Coen-Cagli

Student

Research Assistant

May 2012 to July 2012

University of Geneva

Geneva, Switzerland

- **Principal Investigator:** Professor Alexandre Pouget
- **Project:** Modelling saccadic eye control using probabilistic population codes

Programmer

August 2011 to May 2013

Technical University of Berlin

Berlin, Germany

- **Principal Investigator:** Marianne Maertens
- **Project:** Developing software in Python to control scientific hardware for visual psychophysics

Programmer

November 2009 to July 2010

University of British Columbia

Vancouver, Canada

- **Principal Investigator:** Professor Kurt Haas
- **Project:** Developing software in C to control a fast 2-photon microscope

Research Assistant

April 2009 to July 2009

University of Toronto

Toronto, Canada

- **Principal Investigator:** Jun Luo
- **Project:** Writing an annotated bibliography in the Philosophy of Information & Computation

Programmer

June 2008 to December 2008

University of Toronto

Toronto, Canada

- **Principal Investigator:** Professor Gerald Penn
- **Project:** Developing software in Prolog to estimate probability distributions over parsed linguistic corpora

Research Assistant

June 2008 to December 2008

University of Toronto

Toronto, Canada

- **Principal Investigator:** Jun Luo
- **Project:** Coordinating the "Synesthetes" faculty meeting group, focusing on cognitive science and interdisciplinary research

Programmer

December 2007 to August 2008

University of Toronto

Toronto, Canada

- **Principal Investigator:** Professor Fahiem Bacchus
- **Project:** Developing software in Java to schedule meeting times of potential graduate students

Miscellaneous

Summer/Winter Schools

Dynamics of Multi-Level Systems

Max Planck Institute for the Physics of Complex Systems

Summer 2015

Dresden, Germany

Autonomous Learning

Max Planck Institute for Mathematics in the Sciences

Fall 2014

Leipzig, Germany

Deep Learning and Feature Learning

Institute for Pure and Applied Mathematics UCLA

Summer 2012

Los Angeles, United States

The Future of the Embodied Mind

European Project: Extending Sensorimotor Contingencies to Cognition

Fall 2011

San Sebastian, Spain

Advanced Numerical Bifurcation Analysis

Danish Centre for Applied Mathematics and Mechanics

Summer 2011

Copenhagen, Denmark

Scholarships and Awards

Network of European Neuroscience Schools

Scholarship for training stay in lab of Alexandre Pouget

Summer 2012

Sunflower Scholarship in Philosophy

Award for undergraduate writing in philosophy

Spring 2007

Notable Skills

Languages

- English (Mother tongue)
- German (Fluent)
- French (Working knowledge)

Computer Skills

- Programming Languages: Haskell, C, Python, Matlab, R, Java, Prolog
- Advanced Linux user
- Experience maintaining a software library with approximately 10,000 lines of code
- Experience writing software for interfacing with scientific hardware