Poornima Ramesh

Email:
poornimaramesh1995@gmail.com

GitHub:
github.com/poornimaramesh

Education

PhD in Machine Learning for Science, supervised by Prof. Dr. Jakob Macke **2018–Current**
Technical University of Munichof Tübingen and University , Germany

BS-MS Dual Degree in Physics, GPA: 9.16 **2013–2018**
Indian Institute of Science Education and Research (IISER) Kolkata, India

Indian School Certificate, 94.40% **2013**
Cathedral and John Connon School, Mumbai, India

Research Experience

PhD Research, supervised by Prof. Dr. Jakob Macke **August 2018 - Current**
Technical University of Munich and University of Tübingen, Germany
Developing statistical and deep learning methods for neural data:

- Characterizing retinal ganglion cell responses to electrical stimulation using generalized linear models (Sekhar et. al., 2020)
- Generative adversarial networks for characterising variability in neural data (Ramesh et. al., 2019)
- Statistical methods to decode stimulus identity from neural responses to electrical stimulation.
- Generative adversarial networks for simulation-based inference.

Internship and Masters thesis, supervised by Dr. Jakob Macke **2016 - 2018**
Forschungszentrum caesar, Bonn, Germany
Characterising single neuron responses to electrical stimulation using generalised linear models

Project, supervised by Dr. Supratim Sengupta **2017**
Indian Institute of Science Education and Research (IISER) Kolkata, India
Evolutionary dynamics and game theory; using stochastic methods to model rock-paper-scissors dynamics in diffusing bacterial populations

Internship, supervised by Dr. Oishee Chakrabarti **Summer 2015**
Saha Institute of Nuclear Physics, Kolkata, India
Experimental investigation of the role of ESCRT proteins in cell death

Project, supervised by Dr. Sukant Khurana **2014 - 2015**
Indian Institute of Science Education and Research (IISER) Kolkata, India
Theoretical work on neurogenesis and BDNF - their role in major depressive disorders; biological applications of transcranial magnetic stimulation

Internship, supervised by Prof. Dipak Dasgupta **Summer 2014**
Saha Institute of Nuclear Physics, Kolkata, India
Biophysical techniques to study biomolecular recognition

Work Experience

- Volunteer with Soforthilfe-Corona Bayern, Munich, Germany 2020
- Volunteer translator and data analyst for Crowdfight COVID-19 2020
- Freelance transcriber for CastingWords 2017
- Junior reporter for Daily News and Analysis (DNA) India 2010-2011

Skills

- **Programming:** Python: numpy, scikit-learn, PyTorch for deep learning, Theano; MATLAB; C++; LaTeX
- **Languages:** English, Tamil, Hindi, Bengali, German
- **Mathematics:** Machine learning, probability and statistics, signal processing, linear algebra, dynamical systems

Scholarships and Awards

- Kishore Vaigyanik Protsahan Yojana Fellowship 2013–2018
- Deutsche Akademischer Austauschdienst (DAAD) WISE Fellowship 2016
- Indian National Biology Olympiad: Distinction 2012
- Indian National Physics Olympiad: Distinction 2012
- Science Olympiad Foundation's National Science Olympiad: City Rank 2 2011
- Mahindra Scholarship 2010–2011

Teaching

- Module on Large Scale Modeling and Large Scale Data Analysis, Technical University of Munich 2019–2020
- Fundamentals of Mathematics for Neuroengineering, Technical University of Munich 2018–2019
- Teaching assistant: Numerical Methods for Physics, Indian Institute of Science Education and Research (IISER) Kolkata Autumn 2017

Professional Activities

- Reviewer for Journal of Computational Neuroscience, International Conference on Machine Learning (ICML)
- Supervision of student for Masters' thesis

Workshops and Courses

- Munich Brain Course at LMU, Munich, Germany 2019
- CAJAL Course for Computational Neuroscience, Lisbon, Portugal 2018
- School for Mining and Modeling of Neuroscience Data at University of California, Berkeley, USA 2017
- Workshop on Brain, Computation and Learning at IISc, Bengaluru, India 2017
- Physics of Life Monsoon School at NCBS, Bengaluru, India 2015
- Vijyoshi Science Camp at IISc, Bengaluru, India 2013, 2014

Invited Talks

- Tübingen AI Symposium 2020
- Real Neurons & Hidden Units Workshop, Neural Information Processing Systems 2019 Conference 2019

Publications

Peer-reviewed Articles

Ramesh, Poornima, Mohamad Atayi, and Jakob H Macke (2019b). "Adversarial training of neural encoding models on population spike trains". In: *NeuroAI Workshop, Neural Information Processing Systems 2019, Vancouver, Canada*.

*Sekhar, Sudarshan, ***Ramesh, Poornima**, *Giacomo Bassetto, Eberhart Zrenner, **Jakob H. Macke, and **Daniel L. Rathbun (2020). "Characterizing Retinal Ganglion Cell Responses to Electrical Stimulation Using Generalized Linear Models". In: *Frontiers in Neuroscience* 14, p. 378. ISSN: 1662-453X.

Conference Presentations

Ramesh, Poornima, Mohamad Atayi, and Jakob H Macke (2019a). "Adversarial training of neural encoding models". In: *Bernstein Conference 2019, Berlin, Germany*.

Ramesh, Poornima, Mohamad Atayi, and Jakob H Macke (2019c). "Adversarial training of neural encoding models on population spike trains". In: *Conference on Cognitive Computational Neuroscience 2019, Berlin, Germany*.

*Sekhar, Sudarshan, ***Ramesh, Poornima**, *Giacomo Bassetto, Eberhart Zrenner, **Daniel L Rathbun, and **Jakob H Macke (2018). "Characterizing retinal ganglion cell responses to electrical stimulation using generalized linear models". In: *Bernstein Conference 2018, Berlin, Germany*.

Under Review

Ramesh, Poornima, Jan-Matthis Lueckmann, Jan F. Boelts, Alvaro Tejero-Cantero, David S. Goncalves Greenberg, Pedro J., and Jakob H. Macke (2020). *GATSBI: Generative adversarial training for simulation-based inference.*

Corna, Andrea, **Ramesh, Poornima**, Jakob H. Macke, and Günther Zeck (2020). *Spatial and contrast discrimination in artificial vision using sinusoidal electrical stimulation.*

References

Prof. Dr. Jakob Macke
University of Tübingen, Tübingen, Germany
Email: Jakob.Macke@uni-tuebingen.de

Dr. Pedro J. Goncalves
Forschungszentrum caesar, Bonn, Germany
Email: Pedro.Goncalves@caesar.de

* Equal contribution
** Equal contribution