

EDUCATION

PhD in Machine Learning for Science, supervised by Prof. Dr. Jakob Macke 2018–Current
Technical University of Munich and University of Tübingen, 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., 2018)
- 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 (Corna et al., 2021)
- Generative adversarial networks for simulation-based inference (Ramesh et al., 2022).
- Adversarial inference for climate models of the El-Niño effect.
- Adversarial learning of synaptic plasticity rules

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

- Intern at IDinsight (Delhi Office), India using machine learning to predict out-of-school girls in rural India 2021
- 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

- Probabilistic Machine Learning, University of Tübingen 2022
- Machine Learning for Scientific Discovery Seminar, University of Tübingen 2020-2022
- Teamproject: Prediction neural activity from behaviour, University of Tübingen 2021
- 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), Neural Information Processing Systems (NeurIPS), International Conference on Learning Representations (ICLR)
- 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

- Neuro Meetup, University of Bern 2022
- 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*.
- Ramesh, Poornima**, J.-M. Lueckmann, J. Boelts, A. Tejero-Cantero, D. S. Greenberg, P. J. Goncalves, and J. H. Macke (Apr. 2022a). “GATSBI: Generative Adversarial Training for Simulation-Based Inference”. In: *10th International Conference on Learning Representations (ICLR)*.
- *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.
- Corna, Andrea, **Ramesh, Poornima**, Florian Jetter, Meng-Jung Lee, Jakob H. Macke, and Guenther Zeck (May 2021). “Discrimination of simple objects decoded from the output of retinal ganglion cells upon sinusoidal electrical stimulation”. In: *Journal of Neural Engineering*. ISSN: 1741-2552.

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*.
- Ramesh, Poornima**, Basile Confavreux, T. P. Vogels, and J. H. Macke (2022). “Adversarial learning of synaptic plasticity rules”. In: *Computational and Systems Neuroscience (COSYNE)*.
- Ramesh, Poornima**, J.-M. Lueckmann, J. Boelts, A. Tejero-Cantero, D. S. Greenberg, P. J. Goncalves, and J. H. Macke (2022b). “GATSBI: Generative Adversarial Training for Simulation-Based Inference”. In: *10th International Conference on Learning Representations (ICLR)*.
- *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*.

REFERENCES

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* Equal contribution

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