

# Vasudha Kulkarni

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## EDUCATION

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**Indian Institute of Science Education and Research (IISER), Pune**

BS-MS in Biology

Aug 2019 - May 2024

CGPA: 8.7

## MASTER'S THESIS

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**Behavioural Synchrony in Common Marmosets**

June 2023 - May 2024

*with Prof. Judith Burkart and Nikhil Phaniraj at the University of Zurich (Thesis)*

Establishing an automated 3D pose-tracking pipeline to study gaze following, interpersonal behavioural synchrony and posture imitation in common marmosets using DeepLabCut.

## RESEARCH EXPERIENCE

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**Reinforcement-induced reduction of number of INs in Zebra Finches**

Spring 2023

*with Dr. Raghav Rajan at IISER Pune (Report)*

I conducted a closed-loop behavioural assay using syllable variance measured in real-time to provide negative reinforcement against a high number of introductory note syllables (INs). We saw a significant reduction in the mean number of INs in a test bird.

**Comparative Analysis of Introductory Notes across Four Estrildid bird species**

Fall 2022

*with Dr. Raghav Rajan and Nandu T. S. at IISER Pune (Report)*

We compared the song sequences of 4 Estrildid species using vocal recordings and found that the progression of initial syllables in the song is similar to the patterns observed in introductory notes of Zebra finches.

**Effect of Recent Pathogen Experience on Sanitary Brood Care in Ants**

Summer 2022

*with Prof. Sylvia Cremer and L. Sartoris at the Institute of Science and Technology Austria (Report)*

In this project, we first exposed ants to a fungal pathogen for a brief period and later to contaminated larvae, to test if recent pathogen experience modulates grooming behaviour, but we didn't find any effect. Using quantitative PCR, we concluded that a low-level contamination is lethal for isolated larvae, but not adult ants.

**Reading and Writing Project on Animal Behaviour**

Summer 2021

*with Prof. Raghavendra Gadagkar at the Indian Institute of Science (Report)*

This summer project involved reading several books on animal behaviour, and writing articles based on them, one of which got published on a science communication platform. I also did a literature review of common principles across social and individual immunity.

## POSTER PRESENTATIONS AND TALKS

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- **Kulkarni, V.** Phaniraj, N. Burkart, J. Automated Tracking of Behavioural Synchrony in Common Marmosets. Gesellschaft fur Primatologie (GfP) Conference, Konstanz. March 2024
- **Kulkarni, V.** Phaniraj, N. Burkart, J. Behavioural Synchrony in Common Marmosets. Institute of Evolutionary Anthropology (UZH) Symposium talk. Nov 2023

- **Kulkarni, V.** Rajan, R. Reinforcement-induced Reduction of number of Introductory Notes. IISER Pune Biology Undergraduate Poster Session. April 2023
- **Kulkarni, V.** T. S. Nandu, Rajan, R. Comparative Analysis of Introductory Notes across Four Estrildid bird species. IISER Pune Biology Undergraduate Poster Session. Nov 2022

## RELEVANT COURSEWORK

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- **Biology** - Animal Behaviour, Neurobiology I, Evolution, Ecology I and II, Animal Physiology I and II, Chemical Ecology, Mathematical and Computational Biology, Physiology, Genetics, Cell Biology, Biology of Systems
- **Data Science** - Data Analysis, Bioinformatics, Introduction to Statistical Learning, Generalized Linear Models and their Applications
- **Mathematics** - Multivariable Calculus, Linear Algebra, Introduction to Probability and Statistics
- **Humanities** - History of Science, Science and Society, Political Ecology, Political Thought in India, Disasters and Society, Diseases and Discourse, Contemporary Stories from the Subcontinent

## SKILLS

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- **Programming Languages and Applications:** Python, R, Matlab, Shell scripting; DeepLabCut, Formicidae-Tracker, Python-based recording and annotation programs, Inkscape
- **Libraries:** Numpy, Matplotlib, Pandas, Scipy, Statsmodels, PyQt in Python; Computer Vision Toolbox in Matlab
- **Ethological and Wet lab skills:** Expertise in handling and maintaining ant colonies, zebra finches and marmosets; behavioural annotation, designing and building experimental tasks, DNA extraction and quantitative PCR
- **Languages:** Fluent in English, Kannada, and Hindi; familiar with Sanskrit

## SCHOLARSHIPS AND AWARDS

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- **A H Schultz Grant** (16,100 CHF) - A support grant from the A H Schultz Foundation for my master's thesis at the University of Zurich
- **KVPY Fellow** ( $\approx$  5,600 USD) - Kishore Vaigyanik Protsahan Yojna (Young Scientist Encouragement Program), 2019 - 2024, Department of Science and Technology, Government of India

## SCIENCE COMMUNICATION AND JOURNALISM

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- **A Balancing Act** ([link](#)) - Kalpa, 2022
- **Life is Hard for the Cuckoo too** ([link](#)) - Club SciWri, 2021
- **The Myth of the Coy Female** ([link](#)) - Helicase, 2021
- **Earth, Blossom and Steel** ([link](#)) - Kalpa, 2020

## REFERENCES

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Dr. Raghav Rajan (IISER Pune)  
Email: raghav@iiserpune.ac.in

Prof. Judith Burkart (University of Zurich)  
Email: judith.burkart@aim.uzh.ch