Amlan Nayak

Graduate Student in Computational Biology
Cornell University

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Education

Cornell University — Ithaca, NY, USA
PhD Student in Computational Biology — *August 2023 – Present*

IISER Mohali — Mohali, India
BS-MS Dual Degree in Physics, Minor in Data Science, CPI: 9/10 — *August 2018 – May 2023*

Research Experience

Studying Individual and Collective Predator Evasion in Fish Schools — Sept 2023 – Present
PhD Thesis, Cornell University, Ithaca — *Advisor: Dr. Andrew Hein*

Project: Developing real-time tracking and computational modeling approaches to study decision-making and collective escape dynamics in fish using visual field reconstruction and computer vision.

Studying Collective Behavioural Dynamics of Meerkat Groups — May 2022 – April 2023
Master's Thesis, Max Planck Institute of Animal Behavior, Konstanz — *Advisor: Dr. Ariana Peshkin*

Project: Analyzed GPS and accelerometer data from the Kalahari Meerkat Project to train machine learning models that classify behavioral states and investigate decision-making in social groups.

Study of Lévy Walks in Fish Schools — May 2021 – July 2021
Research Internship, IISc Bangalore, India — *Advisor: Dr. Vishwesha Guttal*

Project: Analyzed the movement of *Etroplus suratensis* to demonstrate that physical interactions within the shoal follow a truncated power-law consistent with Lévy walk behavior.

Study of Onset of Collective and Cohesive Motion — May 2020 – July 2020
Research Internship, IISER Mohali, India — *Advisor: Dr. Abhishek Chaudhari*

Project: Simulated self-propelled particles to explore phase transitions between polar and non-polar states under varying noise levels, with and without cohesion forces.

Publications

L. Kong, L. Gallart, A.G. Grassick, J.W. Love, ***A. Nayak****, and A.M. Hein.* ***A brief natural history of misinformation.*** *J. R. Soc. Interface. (2025, Submitted).*

P. Minasandra, E.M. Grout, K. Brock, M.C. Crofoot, V. Demartsev, A.S. Gersick, B.T. Hirsch, K.E. Holekamp, L. Johnson-Ulrich, ***A. Nayak****, J. Ortega, M.A. Roch, E.D. Strauss, A. Strandburg-Peshkin.* ***Behavioral sequences across multiple animal species in the wild share common structural features.*** *PNAS. (2025).*

Conference Presentations

Nayak, A. (2025, April). *Unraveling Predator Evasion Mechanisms With Zebrafish.* Oral presentation at the 7th CNY Fish Meeting, Syracuse, NY, USA.

Nayak, A. (2025, March). *Unraveling Predator Evasion Mechanisms: Interactive Experiments With Zebrafish.* Oral presentation at the APS Global Physics Summit, Anaheim, CA, USA.

Awards

NITMB Student Travel Award to attend NITMB MathBio Convergence Conference (2025).

Cornell Conference Travel Grant to attend APS Global Physics Summit (2025).

Cornell Fellowship for first two semesters of graduate studies (2023).

Academic Merit Award by IISER Mohali for excellent performance in 8th semester (2022).

Undergraduate Research Opportunities Grant by Max Planck School – Matter to Life (2021).

INSPIRE Scholarship by DST, Government of India (2018–2023).

NTSE Scholarship by NCERT, Government of India (2016).

Teaching Experience

BIOCB 3620/6620: Assisted in lesson planning, delivery, and student support. Provided individualized academic guidance, promoted inclusive education, and facilitated collaborative learning environments.

Volunteer Experience

EYH – Conference for Underrepresented 7th–10th Graders in STEM — Ithaca, USA
Volunteered to promote STEM awareness and mentor students during interactive activities.

Prayatna – IISER Mohali Student Initiative — Mohali, India
Taught underprivileged students and organized clothing donation drives.

Visionaries Group – Support for Visually Impaired Students — India
Recorded, edited, and summarized educational materials to assist visually impaired students.

Mental Health Support Group – IISER Mohali — Mohali, India
Organized awareness events, conducted campus surveys, and supported peers through outreach.

References

Dr. Andrew M. Hein, Assistant Professor — Email: amh433@cornell.edu
Dept. of Computational Biology, Cornell University, USA