

Appilineni Kushal

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Applied mathematician, interested in modelling and making predictions about complex ecological systems

Work Experience and Education

- **University of California, Davis** **Davis, California**
Teaching Assistant, Department of Mathematics and Statistics *2019 - current*
- **National Center for Biological Sciences** **Bangalore, India**
Junior Research Fellow, Simon's Center for the study of Living Machines *2018–2019*
- **Indian Institute of Science** **Bangalore, India**
Bachelors of Science and Masters of Science (BS-MS) dual degree, Physics Major *2013–2018*

Research

- **Assessing different fishery management policies on the fishery with heterogeneous fishers using a network based approach** with *Dr. Fernanda Valdovinos* and *Dr. Micheal Springborn*
 - Explored the effectiveness of different conservation policies (like catch share programs) on biodiversity and economic longevity, in a complex network model with marine species and fishers.
- **Assessing the importance of migration and spatial heterogeneity in insect herbivore outbreaks** with *Dr. Alan Hastings*
 - Studied the effects of migration in resulting herbivore outbreaks in heterogeneous habitats, using neutral landscape models.
- **Application of Data Science Algorithms on US Fire Data**
 - Tested the accuracy of various classifiers (K-means, SVM, Gradient Boosting, Neural Networks etc.) on the data of natural and human caused forest fires, using 20 years of US forest fire data.

Publications

- V. Sasidevan, **Appilineni Kushal**, Sitabhra Sinha. "When big data fails: Adaptive agents using coarse-grained information have competitive advantage". **Physical Review E. 98(2) - Rapid Communication**.
*This paper was selected as **Editor's suggestion** for the August 2018 issue
- **Appilineni Kushal**, V. Sasidevan, Sitabhra Sinha (2017) "Information Asymmetry and the Performance of Agents Competing for Limited Resources". **Econophysics and Sociophysics: Recent Progress and Future Directions, 113-123**.
- Sabiha Majumder, Ayan Das, **Appilineni Kushal**, Sumithra Sankaran, Vishweshia Guttal. "Finite-size effects, demographic noise, and ecosystem dynamics". **Eur. Phys. J. Spec. Top. (2021)**.

Conference Talks

- Accepted to present **Ecological Society of America (ESA) Annual Meeting 2023**, Portland.
- Contributed talk at **American Physical Society (APS) March Meeting 2023**, Las Vegas.
- Contributed talk at **American Physical Society (APS) March Meeting 2022**, Chicago.

Teaching

- **Quantitative Biology courses**
 - Probability and Data Science for Biomedical Engineers
 - Linear Algebra with applications to Biology
 - Mathematical Biology of Infectious Diseases
- **Mathematics courses**
 - Associate Instructor - Introduction to Differential equations (Summer Session 2020, 2021 and 2022)
 - Teaching Assistant for introductory Calculus courses (Fall 2019 - Fall 2021)
- **Volunteer Instruction at a High School**
 - Theory of Equations (2013 summer) and Combinatorics (2014 summer)

Scholastic Achievements

- **Teaching award for outstanding contributions to the development of the core coursework for the Quantitative Biology major (2023)**
- **Recipient of Math Departmental Fellowship (2019 - present, one quarter/year)**
- **IIT-JEE (2013) , All India Rank - 30**
 - IIT-JEE is the entrance exam for Indian Institute of Technology, which's the premier institute in India for an undergraduate in Engineering. It's written by over 1.5 million students all over the country (~ 100 percentile)
- **Kishore Vaigyanik Protsahan Yojna (KVPY) Scholar (2011–2018)**
 - KVPY is a National Fellowship Program, funded by Department of Science and Technology, for highly motivated students pursuing Basic Sciences
- **1st position in *Mimamsa* (2014), a Multidisciplinary Inter-College Science Olympiad**
 - MIMAMSA is an inter college science quiz conducted by IISER Pune. It's the most conceptually challenging competition at undergraduate level in India.

Referees

- **Fernanda Valdovinos** - Department of Environmental Science and Policy, UC Davis
Email ID - fvaldovinos@ucdavis.edu
- **Alan Hastings** - Department of Environmental Science and Policy, UC Davis
Email ID - amhastings@ucdavis.edu
- **Javier Arsuaga** - Department of Mathematics and Statistics, UC Davis
Email ID - jarsuaga@ucdavis.edu

*click on the name to navigate to their webpage