

Achyudhan Kutuva

PH.D. STUDENT AT THE JOINT CMU-PITT PH.D. PROGRAM IN COMPUTATIONAL BIOLOGY

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Education

University of Pittsburgh and Carnegie Mellon University

Pittsburgh, Pennsylvania, USA

Ph.D. in Computational Biology

Aug. 2024 - Present

- Principal Investigators: James Faeder, William Hawse
- Interested in Mechanistic Modeling / Machine Learning in Systems Immunology

University of Florida

Gainesville, Florida, USA

Bachelor of Science

Aug. 2020 - May 2024

- Major in Microbiology & Data Science; Minor: Bioinformatics; Certificate in A.I. Fundamentals and Applications
- GPA: 3.98/4.0

Research Experience

Gene Regulatory Boolean Network for COVID-19, Dr. Reinhard Laubenbacher, Laboratory for Systems Medicine - UF College of Medicine

Gainesville, Florida

Undergraduate Researcher

Jan. 2022 - Present

- Constructed a dynamic Boolean network model (>50 components, Python/PyBoolNet) integrating literature knowledge of intracellular signaling pathways involved in SARS-CoV-2 infection of pneumocytes.
- Investigated the functional role of mTORC1 within the network by executing *in silico* knockout experiments to probe its effects on simulated antiviral responses (e.g., Type-I IFN, apoptosis), testing hypotheses about viral manipulation.
- Assessed overall model robustness and predictive capacity via ensemble simulations (500 runs) validated against experimental gene expression data.

Impact of model selection on estimating minimum radiation dose for tumor control, Dr. Heiko Enderling, Integrated Mathematical Oncology Dept - Moffitt Cancer Center

Tampa, Florida

Summer Undergraduate SPARK Research Intern

Jun. 2021 - Aug. 2021

- Developed and compared mathematical models (cytotoxicity vs. carrying capacity reduction) to assess the impact of model choice and parameters (growth rate, radiosensitivity) on personalized minimum radiation therapy (RT) dose for tumor control.
- Participated in a 10-week SPARK program project (Enderling Lab, IMO Dept.), leading to continued collaboration and a first-author publication in *Frontiers in Oncology*.

Teaching Experience

Mathnasium - The Math Learning Center

Tampa, Florida

Mathematics Instructor

Dec. 2019 - Dec. 2020

- Guided and instructed students of diverse proficiency levels through innovative mathematics teaching methods, fostering deeper understanding and engagement.
- Employed novel instructional strategies to educate students across different skill levels, resulting in improved learning outcomes and increased mastery of mathematical principles.

Leadership

Science Olympiad at the University of Florida

Gainesville, Florida

President

Aug. 2022 - May 2024

- Oversee a board of 15 members and monitor overall progress toward Regional and State tournament preparation, serving upward of 75 Secondary Schools in Alachua County and Surrounding Areas
- Prepare meeting agendas, tournament schedules, and communicate with the Florida State Director
- Previously served as Regional Tournament Director from 2021-22 and Logistics Coordinator from 2020-21

Presentations

A Qualitative Network of Airway Epithelial Cells Infected with SARS-Coronavirus: Construction and Validation

A. Kutuva, 2024 Spring Systems Medicine Student Research Symposium, Gainesville, FL

A. Kutuva, 25th Annual UF Undergraduate Spring Research Symposium, Gainesville, FL

A Boolean Gene Regulatory Network in Airway Epithelial Cells Infected with SARS-Coronavirus: Construction and Validation

A. Kutuva, Systems Medicine Student Research Spring 2023 Symposium, Gainesville, FL

A Boolean Network Model of Gene Regulation in Airway Epithelial Cells in SARS-Coronavirus Treatment

A. Kutuva, 24th Annual UF Undergraduate Spring Research Symposium, Gainesville, FL

A. Kutuva, 2023 Florida Undergraduate Research Conference, Miami, FL

A. Kutuva, Systems Medicine Student Research Fall 2022 Symposium, Gainesville, FL

A Boolean Network Model of Gene Regulation in Airway Epithelial Cells in Response to Viral Infections

A. Kutuva, Systems Medicine Student Research Spring 2022 Symposium, Gainesville, FL

Comparing Radiation Response Dynamics for Different Mathematical Models

A. Kutuva, SPARK Program Final Presentation, Tampa, FL

A. Kutuva, Integrated Mathematical Oncology Department Presentation, Tampa, FL

Professional Development

Bioinformatics Virtual Summer Workshop by UF & Purdue University

Virtual

Aug. 2023

- Attended one-week seminar consisting of seminars from faculty describing topics ranging from Data Analysis using R, RNA-Seq, Python for Bioinformatics, Machine Learning in Bioinformatics, and Single Nucleotide Polymorphism Calling

Southeast Center for Mathematics and Biology Undergraduate Workshop

Atlanta, Georgia

Aug. 2023

- Listened to seminars from faculty collaborating in math-bio interfaces engaging in research ranging from post-translation modification, and neural nets, to topological data analysis of artificial embryos
- Engaged with researchers in academic/industry panels to assess potential career options

Publications

Kutuva, A., Caudell, J., Yamoah, K., Enderling, H., & Zahid, M. (2023). Mathematical modeling of radiotherapy: Impact of model selection on estimating minimum radiation dose for tumor control. *Frontiers in Oncology*, 13. doi:10.3389/fonc.2023.1130966

Honors & Awards

Systems Approaches to Cancer Biology (SACB) 2025 Scholar , Systems Approaches to Cancer Biology Conference	Feb 2025
Charles Vincent and Heidi Cole McLaughlin Endowment for Academic Achievement , UF College of Liberal Arts and Sciences	May 2023
Named a UF Undergraduate Research Scholar , UF College of Medicine	Apr. 2023
AI Diversity Fellow , Awarded by UF College of Agricultural and Life Sciences	Sep. 2022
Organizer's Choice Award , University of Florida Swamphacks VII	Jan. 2021
Dean's List , University of Florida	Aug. 2020 - May 2024
Accepted to University Research Scholars Program , University of Florida	May 2020
Accepted to UF Honors Program , University of Florida	May 2020
Benacquisto Scholarship Recipient , University of Florida	May 2020

Skills

Programming	Java, Python, C++, Matlab, Julia, R
Languages	English, Sourashtra, Tamil (Basic), Spanish (Basic)
Trainings	Certificate of Completion in UF Undergraduate Responsible Conduct of Research (RCR), Bloodborne Pathogens / Hazardous Waste Training