





Ritvik Vasan

PhD candidate,
University of California, San Diego

-  Apr 19, 1993
-  7646 Palmilla Drive, Unit 18,
San Diego, CA, 92122
-  +1 858 952 2680
-  rvasan@eng.ucsd.edu


About Me

I am a mechanical engineer with expertise in applying theoretical and data-driven algorithms to solve biophysical problems. I use fundamental principles of applied mathematics and mechanics to implement open-source solutions using Python.

Education

- PhD** Mechanical Engineering, 2020
UC San Diego
- M.S** Mechanical Engineering, 2017
UC San Diego, GPA: 3.97/4
- B.E** Mechanical Engineering, 2015
BITS Pilani, GPA: 8.8/10

Technical Skills

-  Python
- MATLAB
- Git
- Github
- OpenCV
- R
- Docker
- COMSOL
- SolidWorks/ Inventor/ AutoCAD

Work Experience

- Currently** **Allen Institute** Seattle, WA
 - Investigate cardiomyocyte timelapse data and literature values to implement a mechanical model of actin stress fiber alignment and polarity.
 - Supervisor: Dr. C. Dave. Williams
- Summer 2018** **Allen Institute** Seattle, WA
 - Created an open source force-inference Python package named DLITE to estimate cell-cell forces from max projects of z-stacks in segmented images of ZO-1 tight junctions.
 - Supervisors: Dr. C. Dave. Williams, Dr. Molly M. Maleckar.

Research experience

PhD, Mechanical Engineering

- 2015 – Now** **Laboratory for Computational and Cellular Mechanobiology** UCSD, San Diego, CA
 - Developed theoretical frameworks adopting differential geometry techniques used in computer graphics to estimate forces from cell membrane shapes at the nanometer length scale.
Collaborator: Jeanne Stachowiak, University of Texas, Austin
 - Designed a pipeline that models the spatio-temporal distribution of actin filaments during mammalian clathrin-mediated endocytosis using agent based models (cytosim), continuum models and experiments in human induced pluripotent (hIPS) cells.
Collaborator: David Drubin, University of California, Berkeley
 - Implemented a 3D membrane mechanics model using Iso-Geometric Analysis (IGA) framework to investigate constriction and scission of tubular membrane necks.
Collaborator: Krishna Garikipati, University of Michigan
 - Advisor: Prof. Padmini Rangamani
- Fall 2015** **Nano-Bio Imaging and Devices Lab** UCSD, San Diego, CA
 - Implemented preliminary protocols to develop nano-bowls for targeted drug delivery.
 - Advisor: Prof. Ratneshwar Lal

BS, Mechanical Engineering

- 2014 – 2015** **Applied Physics and Instrumentation Lab** IISc, Bangalore, India
 - Designed a prototype for a smartphone-based microscope attachment, capable of taking 40X images of blood samples for malaria diagnosis.
 - Selected as one of the top innovation projects in India for the Gandhian award.
 - Advisors: Prof. Sai Siva Gorthi, Prof. Anil Gupta
- Summer 2014** **Mechanical Engineering Lab** IISc, Bangalore, India
 - Determined stiffness of MCF-7 breast cancer cells using cell aspiration techniques, atomic-force microscopy and micro-grippers.
 - Advisor: Prof. G. K. Ananthasuresh

Ritvik Vasan

PhD candidate,
University of California, San
Diego

Languages

English	● ● ● ● ●
Hindi	● ● ● ● ●
Kannada	● ● ● ● ●

Personal interests

Soccer	● ● ● ● ●
Running	● ● ● ● ●
Squash	● ● ● ● ●
Guitar	● ● ● ● ●

Career interests

Entrepreneurship	● ● ● ● ●
Team building	● ● ● ● ●
Mentorship	● ● ● ● ●
Business plans	● ● ● ● ●

Publications

2019	Vasan*, Rudraraju, Akamatsu, Drubin, Garikipati, Rangamani To be submitted A mechanical model reveals that non axisymmetric buckling lowers the energy barrier associated with membrane neck constriction
2019	Akamatsu, Vasan*, Serwas, Ferrin, Rangamani, Drubin To be submitted Branched actin filament self-organization and force generation during Clathrin-mediated endocytosis
2019	Vasan*, Maleckar, Williams, Rangamani Under review DLITE uses cell-cell interface movement to better infer cell-cell forces
2018	Vasan*, Alimohamadi, Hassinger, Stachowiak, Rangamani Molecular Biology of the Cell The role of traction in membrane curvature generation
2018	Vasan*, Akamatsu, Schoeneberg, Rangamani Springer Intracellular membrane trafficking: modeling local movements in cells

Presentations/Posters

2019	Biophysical Society meeting Talk Self-Organization and Force Production by the Branched Actin Cytoskeleton during Mammalian Clathrin-Mediated Endocytosis
2019	Biophysical Society meeting Talk Inferring Cell Colony Forces across Time from Tight Junction Intersections in Human Induced Pluripotent Stem Cells
2018	American Society for Cell Biology Poster A new method for tracking cell-cell forces reveals that tension changes during colony rearrangement
2018	Biophysical Society meeting Poster Actin generated forces during mammalian endocytosis
2017	Biophysical Society meeting Poster Energetics of Membrane Necking: Role of Forces and Protein Induced Curvature

Awards

2017	Outstanding graduate student
2016	Frontiers of Innovation and Scholars Program (FISP)

Leadership

2016, 2019	Teaching assistant: MAE 11, Thermodynamics An undergraduate class with over 200 students
2018	Teaching assistant: Software carpentry workshop A multi-day workshop on unix, Git version control, R and Python
2017	Teaching assistant: MAE 209, Continuum mechanics applied to medicine/biology A graduate class in bioengineering
2017	Graduate mentor: Center for Talented Youth An outreach program connecting bright high school students with graduate students
2017	Graduate mentor: ENLACE summer research program A summer outreach program for high school students to spend a summer of research with a graduate supervisor