Ritvik **Vasan**

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Skills

General	Research, Data Science, Computation, Machine Learning, Quantitative Biology
Programming and software packages	Python, LaTeX, PyTorch, Tensorflow, MATLAB, Jython, Git, COMSOL, Solidworks
Soft	Teaching, Mentoring, Public Speaking, Patience, Analytical Thinking, Team-Oriented

Summary

I am a PhD candidate with significant experience in computational mechanobiology and entrepreneurship. I leverage interdisciplinary skills including theoretical modeling, machine learning, software engineering and quantitative biology to answer complex biophysical questions. Along the way, I develop usable tools for the community. I am seeking to expand my experience in technology, innovation and entrepreneurship to make a lasting impact.

Education

University of California, San Diego — *9500 Gilman Drive, San Diego, CA*

PhD in Mechanical Engineering (3.97/4.00) — *2016 - 2020*

M.S. in Mechanical Engineering (3.97/4.00) — *2015 - 2016*

BITS Pilani — *Pilani, Rajasthan, India*

B.S. in Mechanical Engineering (8.76/10.00) — *2011 - 2015*

Experience

Laboratory for computational and cellular mechanobiology — *University of California, San Diego*

PhD candidate — *Dec 2015 - Present*

- Transitioned research from *bio-medical device prototyping* to *computational biophysics*.
- Published *3 peer reviewed papers in 3 years*, before most peers, with 3 other papers in review.
- Participated as *chair and platform speaker* in international conferences like *Biophysical Society*.
- Awarded competitive *Frontiers of Innovation and Scholars Program (FISP)* fellowship and the *UCSD outstanding graduate student award*.
- Created open-source tools that have received press attention from websites like *phys.org, sciencedaily.com and jacobsschool.ucsd.edu*.
- Led collaborative teams of scientists across multiple universities.

Allen Institute for Cell Science — *Seattle, WA*

Summer trainee — *June - Sept 2018 and 2019*

- Initiated project leveraging *advanced machine learning models* to analyze the Allen Institute's cell feature data.
- Implemented and published a force-inference *Python package* named DLITE to estimate cell-cell forces from images.
- Worked in an *open-science* and *team-science* environment.
- Coordinated collaboration between the Allen Institute for Cell Science and UCSD.

Nano-bio imaging and devices lab — *University of California, San Diego*

Research assistant — *Sept - Dec 2015*

- Implemented preliminary protocols to develop *nano-bowls* for targeted drug delivery.

Applied physics and instrumentation lab — *Indian Institute of Science*

Research assistant — *July 2014 - Aug 2015*

- Designed a proof of concept of an *affordable* and *portable* cell-phone microscope for malaria diagnosis.
- Selected as one of the *top innovation projects in India* for the Gandhian award by SRISTI.
- Publicized work through national newspapers and networks.

Mechanical engineering lab — *Indian Institute of Science*

Research assistant — *May - July 2014*

- Determined stiffness of MCF-7 breast cancer cells using cell aspiration techniques, atomic-force microscopy (AFM) and micro-grippers.

Activities

- **Startup competitions**: Winner, 2019 IPHatch, Hong Kong. Pitched a business plan and technical details for a startup utilizing image processing IP made available through the competition.
- **Social innovation competitions**: Winner, 2014 SRISTI grant, India. Pitched a preliminary prototype of a cellphone microscope and received funding for executing a market-viable product.
- **Graduate mentor**: Directed 4 undergraduates and 1 junior graduate student on software engineering tasks and their research.
- **Teaching assistant**: Held discussion sessions and designed assignments for various biomechanics classes and a workshop on Git, Python and UNIX.
- **Outreach**: Designed and advised research projects for high school students through outreach programs like the Center for Talented Youth (CTY) and ENLACE.

Selected Publications

(3 of 6)(* denotes equal contribution)

2019	**Applications and challenges of machine learning to enable realistic cellular simulations** **Vasan**, Rowan, Lee, Johnson,Rangamani, Holst	*In review*
2019	**DLITE uses cell-cell interface movement to better infer cell-cell forces** **Vasan**, Maleckar, Williams, Rangamani	*Biophysical Journal*
2018	**The role of traction in membrane curvature generation** Alimohamadi*, **Vasan***, Hassinger, Stachowiak, Rangamani	*Molecular Biology of the Cell*