

Radhika Patil

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EDUCATION

Stanford University

PhD Student, Mechanical Engineering

California, USA

2016-Present

Indian Institute of Technology (IIT) Gandhinagar

Bachelor of Technology in Mechanical Engineering, Minor in Computer Science and Engineering

Gujarat, India

2012 – 2016

- **Awards & Honors:** President's Gold Medal for graduating batch of 2016; Academic Excellence Scholarship for highest cumulative GPA in entire batch for 2013, 2014, 2015; Dean's list for all semesters.

RESEARCH EXPERIENCE

Stanford University

PhD Student, [Gu Research Group](#)

Stanford, California

June 2017 – Present

- Colloidally synthesized solid and hollow single crystal metallic nanoboxes with smooth and rough surfaces. Experimentally tested them using in-situ electron microscopy compression to show the influence of geometry on structural deformation at nanoscale. Demonstrated the effect of surface roughness as stress concentrators at nanoscale.
- Developed a hybrid method using experimental nanoindentation and finite element modelling to develop computational material models of viscoelastic soft polymeric adhesive thin films.

Selected Projects and Publications:

- Patil, R.P., Doan, D., Aitken, Z.H., Chen, S., Kiani, M.T., Barr, C.M., Hattar, K., Zhang, Y.W. and Gu, X.W., 2020. *Hardening in Au-Ag nanoboxes from stacking fault-dislocation interactions*. *Nature Communications*, 11(1), pp.1-9.
- Kiani, M.T., Patil, R.P. and Gu, X.W., 2019. *Dislocation surface nucleation in surfactant-passivated metallic nanocubes*. *MRS Communications*, 9(3), pp.1029-1033.
- Yin, Y., Patil, R.P. Park, J.M., Gu, X.W., Cai, W. *Modelling viscoelastic properties of optically clear adhesive polymeric thin films*. (In Preparation, collaboration with Samsung Display)
- Patil, R.P., Gu, X.W., *Deformation of amorphous cobalt sulfide nanoboxes*. (Ongoing)

University of Washington

Summer Intern, [Boechler Research Group](#)

Seattle, Washington

May 2015 – July 2015

- Conducted experiments to develop acoustic metamaterials for controlled wave propagation.
- Investigated graphene transfer technique to introduce a thin graphene layer under Langmuir-Blodgett assembled PS microspheres

Indian Institute of Technology (IIT) Bombay

Summer Intern, [S.D. Sharma](#) Cardiovascular Lab, Aerospace Engineering

Mumbai, India

May 2014 – July 2014

- Computational fluid dynamic simulations using ANSYS to model cardiovascular blood flow at artery junctions pre and post Fontan open heart surgery procedure.

OTHER PROJECTS

Product Development, Management and Entrepreneurship

Stanford University

- *BLOOMA – Last mile consumer package delivery system*

Sept 2016 - June 2017

Collaborations: SAP SE; University of Applied Sciences Mannheim, Germany

- Concept video: <https://www.youtube.com/watch?v=18f7GaQVFcU>
- Full text: <https://searchworks.stanford.edu/view/kq227vw2007>

A crowd-sourced package receiving system for individuals and communities making every attempt successful to optimize delivery system for couriers and e-commerce companies. Keeping in mind safety and security using a centrally controllable smart locking system, motion sensors, and live app notifications for safe access to houses for parcel delivery.

- Developed from scratch through a user centered product development approach using design principles, user research and iterative product development strategies.
- Prototyped and presented the concept at the MEDG Stanford design EXPErience Fair.

- FitNew – Fitness made social Fall 2019
 - Used design process and user research to develop MVP for social networking through event app
 - Develop launch plan, monetization strategies, customer acquisition and lifetime costs, grabber and holder ecosystem, and 1-N expansion strategy for the product.
- Designing products for developing countries – healthcare IIT Gandhinagar
Collaboration: Caltech, USA Spring 2014
 - Design process, user research, ideation, and prototyping products to improve health and efficiency of manual labor force operating at open construction sites in India

Data analysis and data mining

Stanford University

Working with data – tools and techniques

Spring 2020

- Process, visualize and analyze crunchbase startup market data using tableau, python pandas and google spreadsheets
- Implement machine learning and data mining on user movie ratings dataset to predict missing values.

Machine Learning, Natural Language Processing and Deep Learning, Reinforcement Learning

Stanford University

- Motion planning in unfamiliar environments Fall 2016
 - Neural networks based RL to implement Roomba-like path finding for simulated bot.
- Word vector representations using character n-grams Winter 2017
 - Develop word vector representations using component character n-grams as a strategy to model unfamiliar, compound and sandhi words.
- Markov decision process model for exploding kittens Fall 2018
 - Two player self-help RL to learning strategies for the game using neural networks and monte-carlo simulations

TECHNICAL SKILLS

- Design thinking, product management, accounting, machine learning
- Python, Matlab, client-side web programming in HTML, CSS, javascript, basic programming C, Java, SQL, R, nodejs
- Tableau, Autodesk Inventor
- Scanning electron microscopy, transmission electron microscopy, in-situ and ex-situ nanoindentations, rheometry, colloidal synthesis of nanoparticles, molecular dynamic simulations

CONFERENCE PRESENTATIONS

- Minerals, Metals & Materials Society (TMS), San Diego California – Oral Presentation 2020
 - Deformation of Single crystal Au-Ag and Amorphous CoS nanoboxes
- Society of Engineering Sciences (SES), St. Louis Missouri – Oral Presentation 2019
 - Hardening in Au-Ag Nanoboxes from Stacking Fault-Dislocation Interactions
- Stanford System-X Alliance, Stanford – Poster presentation 2019
 - Mechanical Response to High Speed Impacts on Optically Clear Adhesive Thin Films
- Gordon Research Conference (GRC), Lewiston Maine – Poster presentation 2018
 - Mechanical Behavior of Ag Nanocubes with Surface Defects

ADDITIONAL

- Yoga and swimming enthusiast; favorite pastime *keyboard and painting*.
- Additional Select Honors and Scholarships
 - Department of Science and Technology Gov. of India, [KVPY](#) Fellowship 2011
 - Department of Science and Technology Gov. of India, [INSPIRE](#) Fellowship 2012
 - NCERT Gov. of India, [NTSE](#) Scholarship 2008
- Teaching Assistantships
 - ME 241: Mechanical Behavior of Nanomaterials (MATSCI 241) Stanford University
Theoretical mechanics for 0D, 1D and 2D nanomaterials, origin of stresses, deformation, elasticity, plasticity, and fracture in nanomaterials, Fall 2018
 - ES 101: Engineering Graphics IIT Gandhinagar
Orthographic, isometric, auxiliary & section views, perspective projections, 3D modelling with Autodesk Inventor Fall 2013