Mohak Patel

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EDUCATION

Brown University, Providence, RI, USA

<u>Ph.D. Engineering</u>, Mechanics of Solids and Structures *GPA: 3.92/4*	Estimated March'19
<u>M.Sc. Computer Science</u> – Focus in Machine learning, Computer Vision & Visualization. *GPA: 4.00/4*	2018
M.Sc. Engineering, Mechanics of Solids and Structures	2016

Indian Institute of Technology (IIT) Gandhinagar, India

B.Tech. with Honors in Mechanical Engineering *Class rank: 2/40*	2013

TECHNICAL SKILLS

Programming: Python, MATLAB, SQL, Mathematica
Libraries/Tools: TensorFlow, PyTorch, scikit-learn, Pandas, Linux, Github. Introductory Spark and Hadoop
Techniques: AI/ML models for classifications, NLP, CV, and recommendations, A/B Testing, and Visualization

EXPERIENCE

Research Assistant, *Ph.D., Brown University, RI, USA. Advisor: Prof. Christian Franck* Sept'13 – present
- Developed novel algorithms, combined with rigorous programming, for 3D motion tracking, quantitative analysis and visualization of large (~18 TBs) 3D image datasets to identify mechanical force signatures of cancer cells.
- Created a new particle tracking algorithm for high-resolution 3D motion reconstruction with 10x speed and 16x accuracy improvement over previous methods. Research won 2nd place in SEM student paper competition.
- Worked with diverse teams to incorporate motion tracking and image analysis in biology and mechanics research.
- Published 6 scientific papers (+3 in submission/preparation) & presented at 5 conferences. Google Scholar <u>link</u>.

Data Science and Machine Learning Projects 2018 – present
- <u>Best Vacation Planner</u> (Python, Scikit-learn, Pandas, BeautifulSoup, Seaborn, SciPy)
    - Collected & analyzed data from various sources to plan the cheapest ski trip in Colorado thus saving $222.
    - Predicted Airbnb listing prices using tree-based ensemble algorithms with a median absolute error of $20.12.
- <u>Stack Overflow Question Tags Recommendation</u> (Python, TensorFlow, NLTK, Scikit-learn)
    - NLP on question title to recommend tags using deep convolutional multi-label sentence classification model.
- <u>Image Cleaning</u> (Python, TensorFlow, NumPy, SciPy, Scikit-learn, ipywidgets)
    - Developed a deep convolutional auto-encoder model to denoise and deconvolve microscope images.
    - Generated synthetic images to train the model using theoretical optical model for a confocal microscope.

CS Graduate Research & Course Projects, *M.Sc., Brown University, RI, USA* May'15 – Dec'18
- <u>Research: Stress Tensor Visualization in Virtual Reality</u> (Unity, Python, MATLAB, C#, Plotly, Scikit-Learn)
    - Created a new visualization for 3D stress tensor fields in Virtual Reality using Unity.
    - Designed and conducted experiments to evaluate the designs through hypothesis testing.
- <u>Course Projects</u> (Python, TensorFlow, Keras, PyTorch, MATLAB, NumPy, SciPy, Scikit-Learn)
    (1) Developed deep learning model to count neurons in 3D images, (2) Machine translation using RNNs, (3) Image reconstruction from edges, (4) Implemented CNN to classify paintings by art styles.

Teaching Roles, *Brown University, RI, USA*

- Instructor: Taught Introduction to Engineering summer at Brown class for 20-30 high-school students.	2016, '17
- Teaching assistant for Mechanics of Solids. Designed labs, graded assignments, and TA hours	2015, '16

Summer Undergraduate Research Fellow, *California Institute of Technology, CA, USA* May'12-July'12
- Designed experiments and studied vesicle adhesion using atomic force microscopy.

AWARDS & LEADERSHIP ROLES

Select Fellowship and Academic Awards

- 2nd place in student paper competition, Society of Engineering Mechanics	2017
- Open Graduate Education fellowship to support funding for Masters in CS, Brown University	2015-'17
- Director's Silver Medal for overall outstanding performance, IIT Gandhinagar	2013

Leadership Roles
- College Soccer Captain, IIT Gandhinagar: Team reached finals of ADFC League'12 and semifinals of Concors'11
- Halla Bol: Led a team of 60 peer students to organize a 9-day sports festival for more than 700 participants.