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
Libraries/Tools: TensorFlow, PyTorch, scikit-learn, Pandas, Jupyter, Github. Introductory Spark, Hadoop and Hive.
Techniques: AI/ML models for classifications, CV, NLP, and recommendations, A/B Testing and Visualization.

EXPERIENCE

Research Assistant, *Brown University, RI, USA. Advisor: Prof. Christian Franck*   Sept'13 – present
- Developed novel algorithms, combined with rigorous programming, for 3D motion tracking and quantitative analysis 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 tracking with 10x speed and 16x accuracy improvement over previous methods. Research won 2nd place in SEM student paper competition.
- Communicated research finding at conferences and through published journal articles. Google Scholar <u>link</u>.

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 experimental protocols and studied vesicle adhesion using atomic force microscopy.

RELEVANT PROJECTS

<u>Personal Data Science/Machine Learning Projects</u>

Best Vacation Planner (Python, Scikit-learn, Pandas, BeautifulSoup, Seaborn, SciPy)
- Collected, cleaned and analyzed data from various sources to plan the cheapest ski trip in Colorado saving $222.
- Predicted Paris Airbnb listing prices using tree-based boosting algorithms with a median absolute error of $20.12.

Stack Overflow Question Tags Recommendation (Python, TensorFlow, NLTK, Scikit-learn)
- NLP on question title to recommend tags using a deep convolutional multi-label sentence classification model.

Image Cleaning (Python, TensorFlow, NumPy, SciPy, Scikit-learn, ipywidgets)
- Trained a deep learning model with synthetically generated images to denoise & deconvolve microscope images.

<u>Graduate Research and Course Projects</u>, M.Sc. Computer Science, Brown University

Research: Stress Tensor Visualization in Virtual Reality (Unity, Python, MATLAB, C#, Plotly, SigmaPlot)
- 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.

Course Projects (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, and (4) Implemented CNN to classify paintings by art styles.

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