Deep Patel

Curriculum Vitae

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Education

August, 2018–Present — **M.Tech(Res)**, *Indian Institute of Science (IISc)*, Bangalore, *CGPA: 7.7/10*.
Department of Electrical Engineering
Thesis' Topic: I am studying and designing algorithms for robust supervised learning under label noise
Advisor: Prof. P.S. Sastry

July, 2012–July, 2016 — **Bachelor of Technology**, *PDPU*, Gandhinagar, *CGPA: 8.29/10*.
Department of Electrical Engineering

Work Experience

September, 2017–July, 2018 — **Project Assistant**, *EE Department*, IISc, Bangalore.
Advisor: Dr. Prasanta Kumar Ghosh
Funding Agencies: DST, India & Pratiksha Trust

August, 2016–September, 2017 — **Graduate Engineer Trainee**, *Reliance Industries Ltd. (RIL)*, Jamnagar, Gujarat.
- Observation of electrical commissioning and maintenance activities at a Low Density Polyethylene Manufacturing (LDPE) Plant, RIL J3 Project

Teaching Experience

September, 2020–January, 2021 — **Teaching Assistant**, *EE Department*, IISc, Bangalore.
Course: Stochastic Models and Applications

January, 2020–June, 2020 — **Teaching Assistant**, *EE Department*, IISc, Bangalore.
Course: Pattern Recognition and Neural Networks (PRNN)

Publications (Related to Thesis)

December, 2020 — Patel, D. et al., '*Memorization in Deep Neural Networks: Does the Loss Function Matter?*' [under review]

Other Publications

Interspeech 2019 — Suhas B. N. et al., '*Comparison of Speech Tasks and Recording Devices for Voice Based Automatic Classification of Healthy Subjects and Patients with Amyotrophic Lateral Sclerosis*' [link]

ICASSP 2018 Aravind Illa, et al., '*Comparison of speech tasks for automatic classification of patients with amyotrophic lateral sclerosis and healthy subjects*' [link]

Research Experience

August, 2019–Present **Robust Supervised Learning under Label Noise**, *Masters Thesis*, IISc, Bangalore.
Advisor: Dr. P S Sastry

- Investigated the role of loss functions in the empirically observed phenomenon of 'memorization' in presence of noisily-labelled data and how loss functions can reduce its degree for better generalization
- Devising a novel sample reweighting scheme that relies on batch-statistics alone for robustness to label noise. The idea of using these statistics is to capture the current learning state and dynamics to control the degree of memorization for better generalization

September, 2017–July, 2018 **Disease Onset & Severity Prediction for ALS**, *EE Department*, IISc, Bangalore.
Advisor: Dr. Prasanta Kumar Ghosh

- Design and creation of a dataset comprising of speech samples from patients with ALS and Parkinson's Disease
- Investigated a variety of speech tasks such as spontaneous speech, rehearsed speech, repeated words, sustained phonation along with articularory features for utility in automatic speech and articulatory data based onset and severity prediction of two neurological disorders: ALS and Parkinson's Disease
- This work has led to two publications, one in ICASSP 2018 and the second in Interspeech 2019

Projects

March, 2019–April, 2019 **Sparse Signal Estimation by Maximally Sparse Convex Optimization**.
Course: Compressive Sensing & Sparse Signal Processing .

- For the problem of denoising, a convex optimization problem was solved which induces strong sparsity (stronger than ℓ_1-norm) with the help of proposed parametric, non-convex penalty functions, and performance comparison was done with classical algorithms such as *Matching Pursuit*, *Basis Pursuit*, and *Hard Thresholding* methods. The task was to understand the theory and reproduce the experimental results. [code]

Extracurricular Activities

June, 2020–Present **Team Member**, *EMPATHS*, IISc, Bangalore.

- Helped organize and moderate events related to mental health awareness and sensitization for the campus community

June, 2019–Present **Team Member**, *NoteBook Drive (NBD)*, IISc, Bangalore.

- Helped organize annual events such as *Children's Day Celebration*, *Note Book Distribution*, and *Scholarship Distribution* which are carried out across 25 government schools in and around Bangalore ($\sim$ 4000 students).
- Helped organize a weekly programme, *Science Mentorship*, wherein government school kids get to study science and maths via interactive experiments and inculcate scientific temperament

Relevant Courses

- Stochastic Modelling & Applications
- Linear & Non-Linear Optimization
- Compressive Sensing & Sparse Signal Processing
- Analysis-I
- Machine Learning
- Convex Optimization

Academic Achievements & Honours

2018 – 2020 Ministry of Human Resources Development (MHRD), Govt. of India, Scholarship Holder

2016 AIR 921 in Graduate Aptitude Test in Engineering (GATE)

2016 Silver Medal (University rank 2 out of 60 students) for academic performance in undergraduate program

Programming Skills

Languages Python

Software & Tools LaTeX, MATLAB, Tensorflow, PyTorch

Languages

- English
- Hindi
- Gujarati
- Kannada (Ongoing effort)

References

IISc, Bangalore **Dr. P.S. Sastry**.
Professor,
Department of Electrical Engineering
email: sastry@iisc.ac.in; website: http://www.ee.iisc.ac.in/faculty/sastry/index.php

IISc, Bangalore **Dr. Prasanta Kumar Ghosh**.
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