Deep Patel

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Education

Aug. 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

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

Aug. 2016 –Sept. 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

Sept. 2020 –Jan. 2021 **Teaching Assistant**, *EE Department*, IISc, Bangalore.
Course: Stochastic Models and Applications

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

Publications (Related to Thesis)

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

Other Publications

Interspeech 2019 Suhas B. N., **Patel, D**, 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, **Patel, D**, et al., '*Comparison of speech tasks for automatic classification of patients with amyotrophic lateral sclerosis and healthy subjects*' [link]

Research Experience

Aug. 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. These statistics capture the current learning state and dynamics to control the degree of memorization for better generalization

Sept. 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 – ICASSP 2018 and Interspeech 2019

Recent 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
- Performance comparison was done with classical algorithms such as *Matching Pursuit*, *Basis Pursuit*, and *Hard Thresholding* methods. [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), Government 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
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