Deep Patel

Room No.: C-235,
Learning Systems & Multimedia Lab,
Electrical Engineering Department,
Indian Institute of Science,
Bengaluru – 560012

+91–7874393934
deeppatel@iisc.ac.in, dbp.patel.1994@gmail.com
dbp1994.github.io
https://in.linkedin.com/in/deep-patel-7032b3a1
dbp1994
Skype - live:dbp.patel.1994

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 **B.Tech**, *PDPU*, Gandhinagar, *CGPA: 8.29/10.*
Department of Electrical Engineering

Work Experience

Sept. 2017 –July 2018 **Project Assistant**, *EE Department*, IISc, Bangalore.
Advisor: Prof. 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 B. N., Suhas, **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 Illa, A., **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: Prof. P S Sastry

- Investigated the role of loss functions in reducing the degree of 'memorization' in neural networks for better generalization under label noise.
- Devising a novel sample reweighting scheme that relies on mini-batch statistics alone for robustness to label noise. These statistics capture the learning dynamics to control the degree of memorization for better generalization even under label noise.

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

- Design and creation of a dataset comprising of speech samples from patients with ALS and Parkinson's Disease
- Investigated utility of a variety of speech tasks along with corresponding articulatory data for automated disease onset and severity prediction of Amyotrophic Lateral Sclerosis (ALS)
- 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, an optimization problem that induces strong sparsity (than ℓ_1-norm) is studied.
- Parametric non-convex penalties are proposed to ensure stronger sparsity of solution and convexity of the optimization problem
- Performance comparison was done with these baselines: *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
Prof. 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
Prof. Prasanta Kumar Ghosh.
Associate Professor,
Department of Electrical Engineering
email: prasantg@iisc.ac.in
website: http://www.ee.iisc.ac.in/people/faculty/prasantg/index.html