

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

- May 2021 – **Ph.D**, *Indian Institute of Science (IISc)*, Bangalore, *CGPA: 8.5/10*.
Present *Department of Electrical Engineering*
Advisor: Prof. P.S. Sastry
- Aug. 2018 – **M.Tech (Research)**, *Indian Institute of Science (IISc)*, Bangalore, *CGPA: 7.7/10*.
April 2021 *Department of Electrical Engineering*
Thesis: A Study of Robust Learning under Label Noise with Neural Networks [[link](#)]
Advisor: Prof. P.S. Sastry
- July 2012 **B.Tech**, *PDPU*, Gandhinagar, *CGPA: 8.29/10*.
–July 2016 *Department of Electrical Engineering*

Work Experience

- Sept. 2017 **Project Assistant**, *EE Department, IISc, Bangalore*.
–July 2018 Advisor: Prof. Prasanta Kumar Ghosh
Funding Agencies: DST India & Pratiksha Trust
- Aug. 2016 **Graduate Engineer Trainee**, *Reliance Industries Ltd. (RIL)*, Jamnagar, Gujarat.
–Sept. 2017 - Observation of electrical commissioning and maintenance activities at a Low Density Polyethylene Manufacturing (LDPE) Plant, RIL J3 Project

Teaching Experience

- Sept. 2020 **Teaching Assistant**, *EE Department, IISc, Bangalore*.
–Jan. 2021 Course: Stochastic Models and Applications
- Jan. 2020 **Teaching Assistant**, *EE Department, IISc, Bangalore*.
–June 2020 Course: Pattern Recognition and Neural Networks (PRNN)

Publications (Related to Thesis)

- PAKDD 2021 **Patel, D.** et al., 'Memorization in Deep Neural Networks: Does the Loss Function Matter?' [[paper](#)] [[video](#)]
- arXiv Preprint (2021) **Patel, D.** et al., 'Adaptive Sample Selection for Robust Learning under Label Noise' [[paper](#)] [[video](#)]

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 – April 2021 **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 'memorisation' in neural networks for better generalisation under label noise. [[Chapter 4 – Thesis](#)]
 - Devised 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 memorisation for better generalisation under label noise. [[Chapter 3 – Thesis](#)]
 - This work has led to one publication – PAKDD 2021 and one arXiv preprint.
 - Currently working towards a curriculum learning-based theory of the proposed adaptive sample selection scheme.
- 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 Amyotrophic Lateral Sclerosis (ALS)
 - Investigated utility of a variety of speech tasks along with corresponding articulatory data for automated disease onset and severity prediction of 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](#)] [[paper](#)]

Extracurricular Activities

- June 2020 **Team Member**, *EMPATHS*, IISc, Bangalore.
–Present - Helping organize and moderate events related to mental health awareness and sensitization for the campus community
- June 2019 **Team Member**, *NoteBook Drive (NBD)*, IISc, Bangalore.
–Present - Helping 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 (~ 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
- April 2021 – **Volunteer**, *GujaratCovidSupport.org*, Ahmedabad.
July 2021 - Carried out verification for CoViD-19 related resources and maintaining a database for the same. (Worked with the team led by **Kumar Manish**)

Relevant Courses

- Stochastic Modelling & Applications
- Linear Algebra
- Detection & Estimation Theory
- Compressive Sensing & Sparse Signal Processing
- Linear & Non-Linear Optimization
- Online Prediction & Learning
- Analysis-I
- Topology
- Information Theory
- Convex Optimization
- Machine Learning
- Game Theory

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
- Gujarati
- Hindi
- Kannada (Ongoing effort)

References

- IISc, **Prof. P.S. Sastry.**
Bangalore Department of Electrical Engineering
email: sastry@iisc.ac.in
website: <http://www.ee.iisc.ac.in/faculty/sastry/index.php>
- IISc, **Prof. Prasanta Kumar Ghosh.**
Bangalore Department of Electrical Engineering
email: prasantg@iisc.ac.in
website: <http://www.ee.iisc.ac.in/people/faculty/prasantg/index.html>