Vihari Piratla

Research Associate, University of Cambridge

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Research Focus

I am passionate about improving human-to-machine and machine-to-human communication with the objective of better aligning learning systems with humans.
Research Areas: Reliable, robust and secure ML systems, Trustworthy ML or Responsible AI

Education

- **Indian Institute of Technology, Bombay**   *June 2017 - July 2022*
  M.Tech. + Ph.D. Dual Degree, Department of Computer Science   GPA: 9.75/10
  Advisors: Prof. Sunita Sarawagi and Prof. Soumen Chakrabarti
  ☆ Google PhD Fellow ☆ Department rank one in the M.Tech. class of >100 students.

- **Indian Institute of Technology, Mandi**   *2010 - 2014*
  B.Tech. Department of Computer Science

Professional Experience

- Research Associate   Aug'22 - *Present*
  Mentor: Dr Adrian Weller   *ML Group, University of Cambridge*
  Trustworthy Machine Learning.
  ☆ Bye-fellow, Churchill College   Feb'23-Present
  ☆ Postdoctoral Research Associate, Trinity Hall College   Sept'22-Jan'23

- Research Intern   Aug'19 - Nov '19
  Mentor: Dr Praneeth Netrapalli   *Microsft Research, India*
  Worked on algorithms that enable efficient transfer and generalization to new domains.
  ☆ Work done during the internship was published at ICML 2020.

- Project Staff   Oct'16 - July'17
  Mentor: Prof. Sunita Sarawagi   *IIT Bombay*
  Contributed features to a complaint management system, such as text or image based automatic complaint categorization, and deduplication.

- Research Member Staff   June'14 - Feb'16
  Mentor: Dr Sudheendra Hangal   *Amuse Labs*
  Worked on a digital archival project called ePADD and developed the following features. (1) A fine-grained entity recognizer that is robust to domain shifts, which is built using distantly supervised binomial mixture models. (2) Cross document co-referencing and entity linking using context cues.

- Research Intern   June'13 - Aug'13
  Mentor: Navneeth S   *GE Global Research*
  Implemented software for distortion correction and 3D registration of Ultrasound images.

Scholastic Achievements

- Vashee Award, and Naik & Rastogi Award for Research Excellence based on PhD thesis submitted in 2022.

- One of the sixteen global recipients of Google PhD fellowship in Machine Learning in 2020.

- Selected to receive Prime Minister's Fellowship for Doctoral Research, 2021 (declined).

- Google, Microsoft travel grants to present at ACL 2019; ICLR 2018 Travel Award.

- Department Rank one among 100 students in the M.Tech. computer science batch of 2019.

- Represented IIT Mandi, as a member of a team, in ACM International Collegiate Programming Contest 2012-13 Kharagpur and 2013-14 Kanpur regional.

- Qualified for the Indian National Mathematical Olympiad after clearing Regional Mathematical Olympiad'09 with a state rank of 26.

Selected Publications

ⓘ In the field of Machine Learning, conference publications are peer-reviewed and are reputed equally as journal publications. Acceptance rate at a conference is usually between 20-30%.

Please see Google Scholar page 🎓 for a full list of publications.

1. Use Perturbations when Learning from Explanations
   J Heo*, **V Piratla***, M Wicker, A Weller   [code][slides]
   Neural Information Processing Systems (NeurIPS) 2023.

2. Focus on the Common Good: Group Distributional Robustness Follows
   V Piratla, P Netrapalli, S Sarawagi   [code][talk][slides]
   International Conference on Learning Representations (ICLR) 2022.

3. Active Assessment of Prediction Services as Accuracy Surface Over Attribute Combinations
   V Piratla, S Chakrabarti, S Sarawagi   [code][talk][slides]
   Neural Information Processing Systems (NeurIPS) 2021.
   ☆ Recognised as an AI Game Changer by NASSCOM in ML Fundamentals category.

4. Efficient Domain Generalization via Common-Specific Low-Rank Decomposition
   V Piratla, P Netrapalli, S Sarawagi   [code][talk][slides]
   International Conference on Machine Learning (ICML) 2020.

5. Topic Sensitive Attention on Generic Corpora Corrects Sense Bias in Pretrained Embeddings
   V Piratla, S Sarawagi, S Chakrabarti.   [code][talk][slides]
   Annual Meeting of the Association for Computational Linguistics (ACL) 2019 (Oral).

6. Generalizing Across Domains via Cross-Gradient Training
   S Shankar*, **V Piratla***, S Chakrabarti, S Chaudhuri, P Jyothi, S Sarawagi   [code][talk][slides]
   International Conference on Learning Representations (ICLR) 2018.

Talks

- Are we teaching machines right? Role of supervision in training ML models.   [slides]
  Presented at IIT Bombay, Google Research India, University of Cambridge in 2023

- Research Challenges when scaling to millions of users through Prediction Service APIs   [talk][slides]
  Presented at Trust ML Rising Star Spotlights Series

- Efficient Domain Generalization via Common-Specific Low-Rank Decomposition   [talk][slides]
  Presented at ICML 2020 Conference

- Topic Sensitive Attention on Generic Corpora Corrects Sense Bias in Pretrained Embeddings. [talk][slides]
  Presented at ACL, Florence

Development Experience

ePADD: Digital Archival Project   Aug'14 – Feb'16
Stanford University Libraries

- ePADD is an open-source project to develop tools for collecting and processing of digital archives.

- Contributed tens of thousands of lines of code for smooth functioning of the application across various operating systems, browsers, compute hardware, and for processing archives that are several gigabytes large.

☆ The features I contributed continue to be a big part of the project to this day: browse here.

Academic Service/Experience

- **Teaching Assistant or Supervisions:** (2017-)
  - ○ Advanced Machine Learning
  - ○ Digital Image Processing
  - ○ Organization of Web Information
  - ○ Data Interpretation and Analysis
  - ○ Learning with Graphs
  - ○ Parallel Programming Paradigms
  - ○ Data Science

- **Student Volunteer:** NeurIPS 2021, ICML 2020, ACL 2019.

- **Reviewer:** ICLR, NeurIPS, ICML, AAAI, IEEE Transactions on Multimedia.
  ☆ Top reviewer at NeurIPS 2023.

Technical Skills

- **Programming & Scripting**: Java, Python, C, Shell Scripting, PERL

- **Technologies** : Spring, HTML, CSS, JavaScript, Lucene

- **Programming Libraries**: PyTorch, GPyTorch, Tensorflow, NumPy, Pyro

- **Languages**: English, Telugu, Hindi

Other Activities

- At IIT Bombay's PG sports events conducted in 2018, I won (or was part of a team that won) **Gold** in the 400m relay, **Silver** in 100m relay, **Bronze** in Volleyball, and finished fourth in the Long Jump.
- I finished 6th in the 2017 and 2018 PG sports 5km running event.
- Trekker with medium level expertise.

References

Prof. Sunita Sarawagi	PhD Supervisor	Professor, IIT Bombay
Prof. Soumen Chakrabarti	PhD Supervisor	Professor, IIT Bombay
Dr Adrian Weller	Postdoc Supervisor	Director of Research, University of Cambridge
Dr Praneeth Netrapalli	Collaborator	Research Scientist, Google Research