



Education

Princeton University

Ph.D. candidate in Machine Learning, GPA – 3.925/4

Advisor: Karthik Narasimhan

Research interests: Natural Language Processing and Reinforcement Learning

Princeton

2019–present

Indian Institute of Technology Madras

Bachelor of Technology, GPA – 9.73/10

Senior Thesis: Leveraging Sentiment Analysis for Reinforcement Learning

Chennai

2015–2019

Professional Experience

Microsoft India (R&D) Pvt Ltd.

Software Engineering Intern

Hyderabad

May 2018–July 2018

- Enabled **faster scale-in** and **scale-out** by **migrating** the core component of Microsoft Azure's Real Time VM Replication service (used for Business continuity and disaster recovery–BCDR) to Azure Service Fabric, a **microservices framework**
- Improved **parallelization** by creating **consistent** and **exclusive** storage structures which facilitated the **migration** of the core
- Reduced CPU usage by 57%** after hosting the service and achieved close to production performance

Wipro Limited

Research Intern

Bengaluru

May 2017–July 2017

- Achieved **higher accuracy** by using **hierarchical classification** (HC) instead of flat classification to organize documents
- Proposed the use of **novel evaluation metrics** for HC which helped gain deeper insights into how **different models** performed
- Induced hierarchies** in a semi-supervised setting by performing **term clustering** based on corpus and **WordNet** similarities
- Authored** a **white paper** highlighting the **technical and business aspects** of Hierarchical Classification

Scholastic Achievements

- Awarded the **CMC Prize** for securing **Branch Rank 2** among 61 students (B.Tech+Dual Degree) of CSE
- Won the **Dr Dilip Veeraraghavan Memorial Award** awarded to the second topper in humanities courses at the institute level
- All India Rank - 122** in **JEE (Advanced) 2015**, taken by 13 lakh students (99.99 percentile) and **first** rank in Karnataka
- Won **Silver Medal** in the **International Chemistry Olympiad 2015**, Azerbaijan (representing India) contested by 80 countries
- All India Rank - 18** in **KVPY 2014**, taken by **2 lakh students**; awarded **NTSE Scholarship** by N.C.E.R.T in 2013
- All India Rank - 160** in Round 1 of **ACM-ICPC International Collegiate Programming Contest 2016**
- Received the government's **MCM scholarship** for being in the **top 10** out of 850 students admitted to IIT Madras in 2015

Publications and Preprints

* indicates equal contribution and **boldface** highlights my name.

Conferences and Workshops

- [1] *Guiding Attention for Self-Supervised Learning with Transformers*
A. Deshpande and K. Narasimhan
Findings of EMNLP (2020).
- [2] *CLEVR Parser: A Graph Parser Library for Geometric Learning on Language Grounded Image Scenes*
R. Saqr and **A. Deshpande**
2nd Workshop for Natural Language Processing Open Source Software (NLP-OSS), EMNLP (2020).
- [3] *Leveraging Ontological Knowledge for Neural Language Models*
A. Deshpande and M. Jegadeesan
Proceedings of the ACM India Joint International Conference on Data Science and Management of Data (2019).

- [4] *FigureNet: A deep learning model for question-answering on scientific plots*
R. Reddy, R. Ramesh, **A. Deshpande**, and M. M. Khapra
2019 International Joint Conference on Neural Networks (IJCNN) (2019).

Notable Preprints.....

- [1] *Sentiment Analysis for Reinforcement Learning*
A. Deshpande and E. Fleisig
arXiv preprint arXiv:2010.02316 (2020).
- [2] *Evaluating a Generative Adversarial Framework for Information Retrieval*
A. Deshpande and M. M. Khapra
arXiv preprint arXiv:2010.00722 (2020).
- [3] *Improvements on hindsight learning*
A. Deshpande, S. Sarma, A. Jha, and B. Ravindran
arXiv preprint arXiv:1809.06719 (2018).

Social and Professional Service

Diversity in AI	<ul style="list-style-type: none"> Princeton AI4ALL, 2020: Research instructor for Princeton AI4ALL, an initiative intended to increase diversity and inclusion in the field of artificial intelligence. Developed material, taught classes, and mentored a group of six students on a natural language processing project on detecting fake news Deep Learning Master Class, 2019 Conducted classes for an audience of 90 undergraduates and post-graduates from different departments, covering basics of machine learning and deep learning [Slides]
Teaching	<ul style="list-style-type: none"> COS324: Introduction to Machine Learning (Prof. Sanjeev Arora), Fall 2020 COS484: Natural Language Processing (Prof. Karthik Narasimhan), Spring 2020*
Reviewing and PC	<ul style="list-style-type: none"> AAAI (2020)

Talks and Posters

- Guiding Attention for Self-Supervised Learning with Transformers [\[Link\]](#) IBM Research, New York, 2020
- CLEVR Parser: Geometric Learning on Language Grounded Scenes [\[Link\]](#) NLP-OSS, EMNLP 2020

Positions of Responsibility

Sponsorship, Saarang 2017	<ul style="list-style-type: none"> Managed publicity content pertaining to Saarang; garnered 2.25 lakh likes on Facebook, increasing it by 90k Part of the Sponsorship team that raised 1.6 Cr INR, highest by any student run college festival in India
Data Analytics, Exebit 2018	<ul style="list-style-type: none"> Single-Handedly managed the Data Analytics event of the Computer Science technical festival Designed the problem statements for the screening round and Kaggle hosted fraud detection challenge
Mentor, Saathi, 2018	<ul style="list-style-type: none"> Mentored a group of 8 freshmen to assist them in academic, co-curricular, and extra-curricular activities

Extra-curricular activities

Sports	<ul style="list-style-type: none"> Part of Inter-College IIT Madras 'B' team for Football two years in a row; Dorm football captain ('17-'18) Won 3 silvers in cycling, 2 silvers in Road-Race (7.8 km) and a bronze in football (Inter-Hostel Sports)
Sci-tech	<ul style="list-style-type: none"> Part of the hostel team which finished 1st in Inter Hostel Technical Meet (TechSoc) 2017 and 3rd in 2016 Finished second out of 500 teams in Mimamsa 2017, an All India Science Quiz held by IISER Pune

Relevant Courses

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| <ul style="list-style-type: none"> Reinforcement Learning Deep Learning Natural Language Processing | <ul style="list-style-type: none"> Topics in Reinforcement Learning Principles of Machine Learning Theoretical Machine Learning | <ul style="list-style-type: none"> Computational Models of Cognition Computational Neuroscience Philosophy of Mind |
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