



## Undergraduate Study

Program	Institution	CGPA	Branch Rank
Bachelor of Technology (2015-2019) Computer Science and Engineering	Indian Institute of Technology Madras Chennai	9.75/10	2/61

## Key Projects

### Neural Question-Answering Framework for Plots: FigureNet

Prof. Mitesh M. Khapra

Accepted at Humanizing AI Workshop, IJCAI 2018

Dec 2017–Aug 2018

- Created a **novel architecture** comprising depth-wise, 1-D convolutions and LSTMs, for question-answering on scientific plots
- Achieved **state-of-the-art accuracy** (83.95%) on [FigureQA Dataset](#) (Maluuba-Microsoft), bettering [Relational Networks](#) (Google DeepMind) by 8.53% and reducing the training time by 93% with 75% lesser computational resources
- Co-authored** a [paper](#) which was **accepted and presented** at Humanizing AI Workshop, IJCAI 2018, Stockholm, Sweden

### Information Retrieval using Generative Adversarial Networks

Prof. Mitesh M. Khapra

Under Review as a conference paper at ICLR 2019

Aug 2018–Present

- Identified issues** with the policy gradient formulation in IRGAN, an **adversarial framework** for Information-Retrieval
- Explained the **abnormal loss curves** by theoretically **validating** the policy gradient baseline term's problem
- Achieved **better performance** in 60% lesser time on all three tasks in IRGAN using a novel model motivated by [co-training](#)
- Primary author** of a technical [paper](#) which is under review as a **conference paper** at ICLR 2019, New Orleans

### Leveraging Ontological Knowledge for Neural Language Models

Prof. Sutanu Chakraborti

Accepted at Young Researchers' Symposium, CoDS-COMAD 2019

Mar 2018–May 2018

- Achieved **higher performance** (5%) and **faster convergence** (35%) in Word2Vec by using WordNet for weight-initialization
- Portrayed **enhanced semantic similarity** by performing domain-transfer of vectors using RCM model and WordNet [Domain](#)
- [Proposed](#) the HRCM model and H-Ordinal Constraints for **hierarchy aware vectors** to settle the **data-knowledge trade-off**

### Prioritized Hindsight Experience Replay: Learning from crucial mistakes

Prof. Balaraman Ravindran

arXiv Article

Jan 2018–May 2018

- Augmented **Hindsight Experience Replay (HER)** with versions of Rank-Based **Prioritized Experience Replay (PER)**
- Reduced running time** of Rank-Based PER (90% lesser) by creating an efficient **open-source implementation**
- Attained **faster convergence** by proposing the use of **linearly attenuated goal sampling** in place of uniform sampling
- Authored** an arXiv [article](#) documenting both useful and failed modifications of P-HER, for easier extensions in the future

## Professional Experience

### Microsoft India (R&D) Pvt Ltd.

Hyderabad

Software Engineering Intern

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

Bengaluru

Research Intern

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** an organization-wide [paper](#) highlighting the **technical and business aspects** of Hierarchical Classification

### Godot Media

Bengaluru

Product Development Intern

December 2016

- Developed an algorithm—to refine and improve **content recommendation routines** for articles—which went **into production**
- Improved** recommendation by performing **topic modeling** and **introducing features** pertaining to trends and source credibility

## Selected Course Projects

### Inducing Hierarchy in Options Framework by using Imitation Learning

Prof. Balaraman Ravindran

Aug 2018–Present

- **Proposed evaluation metrics** like KL-Divergence, count-based, diffusion time and t-SNE embeddings to **evaluate options**
- **Learned options** on various gridworld and **Atari** environments using a generative method, SMDP Q-Learning and H-DQN
- **Prevented mode collapse** and premature termination of options by using **information theoretic** and other regularizers

### GPU Assisted Scheduling

Prof. D. Janakiram

Sept 2017–Nov 2017

- **Dynamically determined** hardware parameters **crucial** for the OS **load balancer** by using **K-Means** and **Genetic algorithms**
- The parameters determined using the **GPU** enable **optimal** resource allocation and **load balancing** in **multi-core** machines
- **Increased throughput** by following a schedule to **minimize** the number of invocations of the GPU load balancer

### Minijava Compiler

Prof. V. Krishna Nandivada

Mar 2018–May 2018

- Realized an **optimizing compiler** for MiniJava (a subset of Java) by implementing and combining the Type Checker, IR Generator, Register Allocator and MIPS Code generator using Flex, Bison, JTB and JavaCC

## Scholastic Achievements

- Awarded the **Huawei (MCM) scholarship** for securing **Branch Rank 2** among 61 students (B.Tech+Dual Degree) of CSE
- **All India Rank - 122** in **JEE (Advanced) 2015**, taken by 1.3 million 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 **200,000 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

## Talks and Presentations

### Deep Learning Master Class

September 2018

Conducted classes for an audience of **90 people** comprising undergraduates and post-graduates, covering basics of Machine Learning and Deep Learning, Optimization, Regularization, CNNs, Word Vectors, RNNs, and Encoder-Decoder Models [\[Slides\]](#)

### A Laplacian Framework for Option Discovery in Reinforcement Learning

October 2018

Presented usefulness of Proto-Value Functions and the paper's Laplacian Framework for finding useful options [\[Slides\]](#)

### Dataless Classification

April 2018

Presented the idea of using semantic information in label names and how this idea dovetails with co-training [\[Slides\]](#)

### Efficiency of information search in children

October 2018

Presented a cognitive approach to explaining how children and adults search for information equally efficiently [\[Slides\]](#)

## Relevant Courses

- |                               |                                    |                                     |
|-------------------------------|------------------------------------|-------------------------------------|
| • Reinforcement Learning      | • Topics in Reinforcement Learning | • Computational Models of Cognition |
| • Deep Learning               | • Principles of Machine Learning   | • Computational Neuroscience        |
| • Natural Language Processing | • Automata Theory                  | • Philosophy of Mind                |

## Positions of Responsibility

- |                             |   |
|-----------------------------|---|
| Sponsorship, Saarang 2017   | • Managed publicity content pertaining to Saarang; garnered <b>225,000 likes</b> on Facebook, <b>increasing</b> it by 90k |
|                             | • Part of the Sponsorship team that raised 16 million INR, <b>highest</b> by any student run college festival in India    |
| Data Analytics, Exebit 2018 | • Single-Handedly managed the <b>Data Analytics event</b> of the Computer Science <b>technical festival</b>               |
|                             | • <b>Designed the problem statements</b> for the screening round and Kaggle hosted fraud detection challenge              |
| Mentor, Saathi, 2018        | • <b>Mentoring</b> a group of 8 freshmen to assist them in academic, co-curricular and extra-curricular activities        |

## Extra-curricular activities

- |          |   |
|----------|---|
| Sports   | • Part of Inter-College IIT Madras 'B' team for Football two years in a row; Hostel football <b>captain</b> ('17-'18)                                   |
|          | • Won 3 <b>silvers</b> in cycling, 2 <b>silvers</b> in Road-Race (7.8 km) and a <b>bronze</b> in football (Inter-Hostel Sports)                         |
| Sci-tech | • Part of the hostel team which finished <b>1<sup>st</sup></b> in Inter Hostel Technical Meet ( <b>TechSoc</b> ) 2017 and <b>3<sup>rd</sup></b> in 2016 |
|          | • Finished <b>second out of 500 teams</b> in Mimamsa 2017, an <b>All India Science Quiz</b> held by IISER Pune  |