

Education

2015-2020	Dual Degree (B.Tech + M.Tech) in Computer Science and Engineering <i>Indian Institute of Technology Madras, Chennai</i>	CGPA: 8.52
2015	XII - Karnataka Board, KLE Society's Independent PU College, Bangalore	97.30 %
2013	X - ICSE, B P Indian Public School, Bangalore	96.33%

Professional Experience

- May - July 2019 **Autocorrect Feature in Google Docs**
Summer Internship, Google India, Bangalore
- Developed a new feature comprising of user interface behaviour and corresponding actions for pre-existing autocorrect operations (such as capitalization), to alert the user that an autocorrect has occurred and provide an interface to undo it
 - Worked on the implementation of an improved version of autocorrect that corrects misspellings and grammatical errors
 - Developed feedback and logging mechanism for the autocorrect feature, and proposed success metrics to assess the performance of the same
 - Presented a poster on the design, implementation and usability of the feature at an office-wide poster session.
- May - July 2018 **Text to Scene Conversion in Augmented Reality**
Summer Internship, Adobe Research Labs, Bangalore
- Proposed and developed a pipeline for converting natural language descriptions to 3D scenes in Augmented Reality, comprising of NLP and ML components, that construct the scene through prediction of object sizes and positions
 - Developed a mobile application to showcase the applicability of the system developed, which demonstrated major performance improvements over previous systems
 - A poster on the work has been accepted at the [ACM User Interface Software and Technology Symposium 2019](#)
 - A patent on the work has been filed at the US PTO (Application No. 16/247,235)
- May - July 2017 **Cognitive Approach to Natural Language Processing**
Summer Internship, Prof. Veni Madhavan, Indian Institute of Science (IISc), Bangalore
- Worked on a cognitive approach to Natural Language Processing, which combines syntactic and semantic approaches
 - Developed a cognitive parser which processes textual data into cognitive structure representation
 - Created a software incorporating the above algorithms, that would be used as a feature extractor for various NLP tasks

Projects

- Aug - Dec 2018 **Leveraging Ontological Knowledge for Neural Language Models**
Course: Computational Models of Cognition, [Prof. Sutanu Chakraborti](#), Indian Institute of Technology Madras
- Incorporated Weight Initialization in learning word embeddings using the [WordNet Ontology](#) for a task specific to the *Construction* domain, resulting in a faster convergence rate and better representation of domain-specific terms
 - Proposed three models that induce hierarchical relations between words in the embeddings using the structure of the ontology, specifically for domain transfer applications
 - Presented a [publication](#) and [poster](#) at the [ACM CODS-COMAD Young Researchers' Symposium 2019](#)
- July - Dec 2018 **Multimodal Dialogue Generation**
Course: Undergraduate Research in Computer Science, [Prof. Mitesh Khapra](#), Indian Institute of Technology Madras
- Proposed and implemented a model to prove the hypothesis that integrating domain-relevant features improves the performance of image retrieval in multimodal dialogue systems in the fashion domain, using the [MMD](#) dataset
 - Proposed and explored the performance of attention and memory based models with appropriate adaptations for multimodal dialogue, along with domain knowledge integration
 - Explored the use of Graph Convolutional Networks for modeling the various components of multimodal dialogue
- March - April 2019 **Risk-Sensitivity in Multi-Armed Bandits**
Course: Multi-Armed Bandits, [Prof. L.A. Prashanth](#), Indian Institute of Technology Madras
- Empirical survey of the existing methods for risk-sensitivity in stochastic bandit problems, spanning risk measures like Variance, Value at Risk (VaR) and conditional Value at Risk (cVaR)
 - Implemented multiple risk-sensitive algorithms for each measure, performed a qualitative and quantitative analysis
 - Introduced novel modifications of the Explore-Then-Commit algorithm for VaR and cVaR measures - both showing performance competent with existing risk-sensitive algorithms
- Feb - March 2018 **Summarization and Keyword Extraction using TextRank**
Course: Natural Language Processing, [Prof. Sutanu Chakraborti](#), Indian Institute of Technology Madras
- Performed a detailed analysis of the existing [TextRank](#) algorithm, a page-rank based algorithm for text summarization and keyword extraction, and incorporated novel improvements on it

- Oct - Nov 2018 **Risk-Sensitive Reinforcement Learning**
 Course: Reinforcement Learning, [Prof. L.A. Prashanth](#), Indian Institute of Technology Madras
- Empirically analyzed the existing methods for risk-sensitive RL, spanning various risk measures like variance bounds and probability of risk bounds, and incorporating them in algorithms like Q-learning and SARSA
 - Introduced a new risk measure and corresponding algorithm that maximizes distance from error states in a Gridworld
- Dec 2016 **Scaling Graph Algorithms**
 Winter Project, [Prof. Rupesh Nasre](#), Indian Institute of Technology Madras
- Implemented algorithms for maximum network flow (Edmonds-Karp algorithm) in a graph and finding a maximum matching in a bipartite graph (Hopcraft-Karp algorithm)
 - Optimized the running time for real data graphs such that the algorithm ran efficiently on graphs with up to 10,000 vertices and 1 lakh edges
- Nov 2017 **Skin Disease Diagnostic System**
 Microsoft *code.fun.do* Contest, Indian Institute of Technology Madras
- Designed a web application that attempts to diagnose skin diseases based on images of the person's skin
 - Developed using a deep learning based approach, with a dataset created by scraping annotated images from the web
- Sept - Oct 2017 **Breakout Game**
 Course: Paradigms of Programming, [Prof. Anurag Mittal](#), Indian Institute of Technology Madras
- Developed an Android application for the Breakout game from scratch, with basic playing and scoring features

Publications and Patents

- [Publication and Poster] **Leveraging Ontological Knowledge for Neural Language Models ([Paper](#), [Poster](#))**
[Ameet Deshpande](#), [Monisha Jegadeesan](#)
 In [ACM CODS-COMAD](#) Young Researchers' Symposium 2019
- [Poster] **ARComposer: Authoring Augmented Reality Experiences through Text**
[Sumit Kumar](#), [Paridhi Maheshwari](#), [Monisha Jegadeesan](#), [Amrit Singhal](#), [Kush Kumar Singh](#), [Kundan Krishna](#)
 In ACM User Interface Software and Technology Symposium ([ACM UIST](#)) 2019
- [Patent] **Visualizing Natural Language through 3D Scenes in Augmented Reality**
[Sumit Kumar](#), [Paridhi Maheshwari](#), [Monisha Jegadeesan](#), [Amrit Singhal](#), [Kush Kumar Singh](#), [Kundan Krishna](#)
 Filed at the US PTO (Application Number: 16/247,235)

Skills

- Languages C, C++, C#, Java, Python, HTML, CSS, Javascript
- Tools Unity, ARCore, Android Studio, Stanford CoreNLP, git, Bootstrap, jQuery, AngularJS
- Libraries NLTK, django, scipy, pandas, sklearn, gensim, keras, tensorflow

Courses

(* - Ongoing)

- [Statistical Learning] Topics in Deep Learning*, Deep Learning, Machine Learning, Natural Language Processing, Reinforcement Learning, Multi-Armed Bandits, Probabilistic Graphical Models, Computational Models of Cognition
- [Curriculum] Computer Networks, Database Systems, Operating Systems, Data Structures and Algorithms, Object-Oriented Programming
- [Mathematics] Probability-Statistics-Stochastic Processes, Discrete Mathematics, Graph Theory

Scholastic Achievements

- First runner-up in the **AWS Deep Learning Hackathon** held in Shaastra 2018, IIT Madras:
 Implemented a prototype of a proposed idea involving recognition and translation of English text on signboards and posters into user's vernacular language
- State Rank 17** in Karnataka Common Entrance Test for Engineering, 2015, out of approximately 1.2 lakh students
- Topped respective academic institutions in both **Class X and Class XII** board exams

Positions of Responsibility

- June 2019 **Organizer, Management Team, Tech Intern Connect**, Google, Bangalore
- Member of the managing committee that organized the event, hosting technology interns from all over the city
- June - Dec 2016 **Technical Operations Coordinator**, *Shaastra 2017*, Indian Institute of Technology Madras
- Developed the frontend components of major websites and portals for the technical fest of IIT Madras

Extra Curricular Activities

- Sports Part of NSO (Sports at IIT Madras) Basketball during first year of engineering (2015-16)
- Cultural Trained in the classical dance form of Bharatanatyam for six years