Monisha J (CS15B053)

Indian Institute of Technology Madras

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Education

2015-20 **5th Year - Dual Degree in Computer Science and Engineering**
Indian Institute of Technology Madras, Chennai CGPA : 8.52

2014-15 **XII - Karnataka Board,** *KLE Society's Independent PU College, Bangalore* 97.3 %

2012-13 **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 UI behaviour and user actions for pre-existing autocorrect operations (such as capitalization) - to alert the user that an autocorrect has occurred, and provide the 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 that which would be used as a feature extractor for various NLP tasks

Projects

Aug - Dec 2018 **Leveraging Ontological Knowledge for Neural Language Models**
Prof. Sutanu Chakraborti, Indian Institute of Technology Madras
- Incorporated Weight Initialization in learning word emeddings 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
- A publication and poster were presented at **ACM CODS-COMAD Young Researchers' Symposium 2019**

July 2018 - March 2019 **Multimodal Dialogue Generation**
Prof. Mitesh Khapra, Indian Institute of Technology Madras
- 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
- Explored the performance of attention and memory based models for multimodal dialogue, with domain knowledge integration
- Explored the use of Graph Convolutional Networks for modeling multimodal dialogue systems

March - April 2019 **Risk-Sensitivity in 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 and performed a qualitative and quantitative analysis
- Introduced modifications of Explore-Then-Commit algorithm for VaR and cVaR measures - both showing performance competitive with existing risk-sensitive algorithms

Feb - March 2018 **Summarization and Keyword Extraction using TextRank**
Prof. Sutanu Chakraborti, Indian Institute of Technology Madras
- Performed a detailed analysis of the existing algorithm and incorporated improvements on TextRank, a page-rank based algorithm for summarization of text and keyword extraction from text

Oct - Nov 2018 **Risk-Sensitive 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, incorporating them in algorithms like Q-learning and SARSA
- Introduced a new risk measure that maximizes distance from error states in a Gridworld

Dec 2016 **Scaling Graph Algorithms**
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. 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**
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)**
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)

[AI-related] 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 2016 - Jan 2017 **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