Megh Thakkar

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Objective

Seeking six months internship positions in the domain of machine learning, deep learning and natural language processing.

Education

Birla Institute of Technology and Science (BITS), Pilani *2016-2020*
B.E. in Computer Science Engineering, *GPA: 9.23/10* Pilani, India
Relevant Courses: Neural Networks and Fuzzy Logic, Information Retrieval, Data Mining, Linear Algebra, Calculus, Probability and Statistics, Object Oriented Programming, Data Structures, Algorithms, Database Systems, Computer Programming

Research Experience

NTU-NLP, Nanyang Technological University, *Aug 2020 – Present*
Open Domain Question Answering by Jointly Using Text and Knowledge Base. Singapore

- Working on improving **retriever-reader models** for **open domain question answering**, currently for the Natural Questions Dataset.
- Constructing **networkx graphs** from retrieved documents using identified entities and enhancing the text representation using **graph convolutional networks**.
- Experimenting with various transformer models (**BERT** and **RoBERTa** for the retriever, **BART** and **T5** for the reader) for knowledge-enhanced answer generation.

Speech and Language Processing Group, Nanyang Technological University, *Aug 2019 – Dec 2019*
Speech Emotion Detection and Dialogue Generation. Singapore

- Created an **API Gateway** to access various existing deep learning modules such as NER (Name-Entity Recognition), SUD (Sentence Unit Detection), and summarization through a standard interface.
- Built a **light weight** production ready **CNN based model** for speech based emotion detection.
- Collaborated on a project aimed at **diversifying dialogue generation** models using a context based **generator-discriminator architecture**.

Language Technology Group, University of Hamburg, *May 2019 – July 2019*
Language Model for Query Auto-completion. Hamburg, Germany

- Developed a bi-LSTM based hybrid **character level language model** infused with word embeddings, such as GloVe, ELMo, and Flair, as well as a combination of FastText and sent2vec.
- Used decoding methods like **beam search** and **top k** sampling along with reranking methods such as **LambdaMART** and tensorflow-ranking.

Indian Institute of Remote Sensing (IIRS), *May 2018 – July 2018*
UAV Flight Planner with Shadow Exclusion. Dehradun, India

- Developed a software for automatically **generating the path of a UAV**, with **planimetry** and **altimetry**.
- Calculated terrain regions under a shadow using **ray tracing** and **Bresenham's Line Drawing** algorithm, which were subsequently minimised to increase the UAV's efficiency.

Relevant Projects

VQA Models that Read Text *Jan 2020 – May 2020*

- Conducted literature review and studied various methods of **multimodal deep learning**, **multimodal attention** and its applications in downstream tasks such as **TextVQA** and **Visual Commonsense Reasoning**.
- Identified approaches to enhance the baseline model by improving the **OCR module** using simple heuristics.
- A **book chapter** on multi-modal learning and its applications for text reading and visual commonsense reasoning is in submission.

Visual Question Answering *Aug 2018 – Dec 2018*

- Implemented a basic **visual question answering** system for the MS Coco Dataset.
- Used the pretrained **VGG 16** model for image feature extraction and stacked **LSTM layers** for text feature extraction.
- Experimented with combining the multimodal feature vectors using naive **concatenation** and **Hadamard product** approaches for the final classification.

Feedback-based Retrieval System with Sentence Ranking *Oct 2018 – Dec 2018*

- Designed and implemented an efficient, configurable, and intelligent retrieval framework for text documents.
- Used NLP methods and concepts such as **stemming**, **tf-idf scores**, **BM25 scores** and **nltk** for text processing.
- Implemented a **click-based feedback system** to improve suggestions to re-rank documents based on current retrieval.

Technical Skills

Programming – Python, C, Java, C++, SQL, Scala
Libraries and Frameworks – PyTorch, pytorch-geometric, Keras, scikit-learn, NLTK, networkx, Django, REST

Academic Achievements

- Awarded the **DAAD-WISE scholarship** to pursue summer research in Germany and the **mitacs Globalink** scholarship to pursue research in Canada.
- Awarded the **Institute Merit Scholarship** for being in the top 3 percentile of students across all the departments.