Megh **Thakkar**

DEEP LEARNING · NATURAL LANGUAGE PROCESSING ENTHUSIAST

Room 230, Bhagirath Bhavan, BITS Pilani, Pilani, Rajasthan, India - 333031

(+91) 98297-99877 | ✉ megh.1211@gmail.com | 🏠 Megh-Thakkar.github.io | Megh-Thakkar | megh-thakkar

Education

Birla Institute of Technology and Science (BITS), Pilani *Pilani, Rajasthan, India*
BACHELORS OF ENGINEERING IN COMPUTER SCIENCE *Aug. 2016 - Jul. 2020*
- Among the top 10% students of the department with a cumulative GPA of **9.2/10** and graduated with distinction.
- Recipient of Institute Merit Scholarship for excellent academic performance on multiple occasions.

The New Tulip International School *Ahmedabad, Gujarat, India*
MAJOR IN MATHEMATICS, PHYSICS AND CHEMISTRY *Jul. 2014 - May 2016*
- Secured the second rank in the state for All India Senior School Certificate Examination, with **97.2**%.

Experience

Multimedia and Interactive Computing Lab, Nanyang Technological University *Singapore, Singapore*
VISITING RESEARCHER *Aug. 2019 - Jan. 2020*
- Worked on improving diversity of **text generation models**, particularly for **dialogue generation**.
- Simultaneously creating an **API Gateway** to access various modules such as NER (Name-Entity Recognition), SUD (Sentence Unit Detection), and summarization through a standard interface. Created a basic CNN based architecture for **emotion recognition from speech** for the gateway.

Language Technology Lab, Universität Hamburg *Hamburg, Germany*
DAAD SCHOLAR *May 2019 - Jul. 2019*
- Created a **Language Model for Query Autocompletion** for unseen prefixes.
- Developed a **hybrid character level model** infused with **word embeddings**, experimenting with ELMo, Flair and BERT as well as a combination of FastText and sent2vec to capture the context.
- **Beat the previous state-of-the-art** MRR score on the AOL Search Query Log dataset by **2.2%**.
- Further improved the suggestions using **LambdaMART** and **Tensorflow-ranking** along with **beam search**.

CEERI - Central Electronics Engineering Research Institute *Pilani, Rajasthan, India*
PART-TIME RESEARCH INTERN *Aug. 2018 - Nov. 2018*
- Worked on the implementation of a **Visual Question Answering System**.
- Used a **stacked LSTM** architecture for text based feature extraction from textual queries and pretrained **VGG16** weights for image feature extraction .
- Used **Multi-modal low-rank bilinear pooling** scheme for integration of image and question language features for answering based on the **VQA** dataset.

Open Bioinformatics Foundation, Google Summer of Code 2018 *India - Australia*
SUMMER INTERN *May 2018 - Aug. 2018*
- Led the development of a new website for BioJS, a community-based project compiling **JavaScript widgets** and **modular components** to visualize and process biological data using web technologies.
- Worked closely with frameworks such as **Django** and **Pyramid** as well as technologies including **Gunicorn**, **nginx** and **Ansible**.

Indian Institute of Remote Sensing, Indian Space Research Organization *Dehradun, Uttarakhand,India*
RESEARCH INTERN *May 2018 - Jul. 2018*
- Developed a software for automatically **generating the path of an Unmanned Aerial Vehicle**, considering both **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.

Projects

TextVQA *Pilani, Rajasthan, India*
MULTIMODAL LEARNING PROJECT *Jan. 2020 - Present*
- Working on creating models to read text based on question asked and image given.
- Main task involves combining **image** and **text** features with an **optical character recognition** system.
- Skills applied : python, pytorch

Toy Compiler *Pilani, Rajasthan, India*

COMPILER CONSTRUCTION PROJECT *Jan. 2019 - Apr. 2019*

- Created a mini compiler in C for a given custom language as a part of **Compiler Construction** course.
- Created front-end and back-end components of a compiler including **lexer**, **parser**, **AST**, **symbol tables**, **type and semantic analyzer** as well as **code generator**.
- Skills applied : C, NASM

Feedback-based Retrieval System with Sentence Ranking *Pilani, Rajasthan, India*

INFORMATION RETRIEVAL PROJECT *Oct. 2018 - Nov. 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.
- Skills applied : python, nltk, scikit-learn, pytorch

Convolutional Neural Network in Scala *Pilani, Rajasthan, India*

FUNCTIONAL PROGRAMMING PROJECT *Oct. 2018 - Nov. 2018*

- Developed a two layer deep convolutional neural network in scala using **purely functional programming concepts**.
- Created as a part of partial fulfilment of the course **Principles of Programming Languages**.
- Skills applied : scala, functional programming

Smart Campus Mobile Wallet *Pilani, Rajasthan, India*

TECHNICAL LEAD, REST API DEVELOPER *Jan. 2018 - Feb. 2018*

- Led the development of an **android application** with a **dedicated backend** for starting a smart campus initiative defined by a mobile wallet for over 5000 students of BITS Pilani.
- The wallet was launched at APOGEE 2018, the technical festival of BITS, Pilani, and observed transactions amounting to **INR 200,000** over a course of 4 days, at food stalls of the festival.
- Skills applied : python, Django, REST, MySQL, Git

Academic Achievements

2018	**DAAD-WISE Scholarship**, Recipient of the highly competitive **Working Internships in Science and Engineering** scholarship by **German Academic Exchange Service** to conduct research in **Germany**.
2018	**Mitacs Globalink Scholarship**, Recipient of the scholarship to conduct research in **Canada**.
2016-2018	**Institute Merit Scholarship**, Recipient of the Institute Merit Scholarship on multiple occasions, given to the top 3% students across all the departments of the university.
2018	**Google Summer of Code 2018**, One of the 1,268 students selected for the prestigious GSoC, 2018.
2016	**Joint Entrance Examination**, All India Rank 105 among over 1.2 million candidates.

Relevant Coursework

COMPUTER SCIENCE

- Neural Networks and Fuzzy Logic, Data Mining, Information Retrieval, Data Structures, Analysis of Algorithms, Object Oriented Programming, Computer Programming, Operating Systems, Computer Architecture, Computer Networks

MATHEMATICS

- Linear Algebra with Matrix Operations, Probability and Statistics, Differential Equations, Complex Algebra, Advanced Calculus

Positions of Responsibility

Council of Students for Academic Activities(CoStAA) *Pilani, Rajasthan, India*

CORE COUNCIL MEMBER *Apr. 2018 - Mar. 2019*

- The CoStAA comprises of 9 elected members and is the supreme body responsible for all extracurricular academic activities at BITS Pilani, including overseeing the working of disciplinary associations and conducting one of India's largest completely student-organized technical festivals, APOGEE.
- I was responsible for managing all the technical aspects of the festival, such as registrations, accommodation allocation, online payments, food stall applications as well as smart ticketing systems, while coordinating with fellow elected members for the overall functioning of the fest.

Student Faculty Council *Pilani, Rajasthan, India*

CORE TEAM MEMBER *Aug. 2017 – Dec. 2017*

- Member of the Student Faculty Council of the Department of Computer Science and Information Systems, BITS, Pilani, comprising of the Head of Department, senior professors as well as top performing students.
- The primary goal of the council is to act as a bridge between the students and the professors and hence, improve the research environment on the campus by suggesting important reforms, academic and non-academic.
- The council is responsible for tackling issues faced by students first-hand, as well as provide a student-centred perspective for the education methodology and content being followed.