SAHIL KHOSE

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GitHub ◇ LinkedIn ◇ Google Scholar ◇ Website

EXPERIENCE

Artifical Intelligence and Robotics Lab (AIRL), IISc Bangalore
AI Research Intern *July 2021 - Present*

· Working on **Continual Generalized Zero-Shot Learning** under Dr Suresh Sundaram.

Manipal Institute of Technology (*Prof Harish Kumar J.R.*)
AI Research Intern *April 2021 - Present*

· Working on fovea disc segmentation for opthamological diagnosis using semi-supervised segmentation methods

Project MANAS
AI Division *Feb 2019 - May 2021*

· Worked with a team of **80+ members** across multiple sub divisions
· Individually conducted **100+** interviews for the selection process across a span of 2 recruitment drives.
· Mentored over **2 dozen** students over a **6 months** comprehensive selection process for the AI division

Technical Projects

· Implemented a novel approach for a **binocular stereo** module to generate depth maps.
· Developed a **Driving Imitation System** using 3 camera sensor inputs.
· Developed a **Speed Bump Detection** module using camera and 3-D LiDAR data.
· Developed a **Lane Detection** module using camera to work for robust lighting conditions.

PUBLICATIONS

- *BERT based Transformers lead the way in Extraction of Health Information from Social Media*: available on [aclweb] and [GitHub], published in proceedings of **SMM4H 2021** hosted by **NAACL**.
- *Semi-Supervised Classification and Segmentation on High Resolution Aerial Images*: available on [arXiv] submitted to **EARTHVISION 2021** workshop hosted by **CVPR 2021**. [Demo] [GitHub] [Blog]

PROJECTS

StackGAN for text to image generation [GitHub] *Oct 2020*

- Implemented and trained the **StackGAN** paper from scratch in PyTorch to generate 256x256 high resolution images of birds (CUB dataset) using only their text description.
- Major change to the model implementation as compared to the paper was the use of BERT embeddings for text descriptions

QANet for SQuAD 2.0 [GitHub] *Sep 2020*

- Built a system to solve the **SQuAD 2.0** Question-Answering dataset. Implemented the **QANet** paper from scratch in PyTorch, the architecture consists exclusively of **convolution and self-attention**, where convolution models local interactions and self-attention models global interaction.
- The **context and question** are passed through independent stacked **embedding encoder blocks** followed by **context-query attention** which combines the 2 branches. This is followed by multiple stacked **model encoder blocks** which send their output to 2 different branches which predict the **start and end** probability of the answer in the context.

Stock Prediction using Hyper Graphs [GitHub] *Aug 2020*

- Built a **Hypergraph Neural Network** based architecture for stock prediction of 500 stocks.
- Developed a **hypergraph** structure based dataset, modelling the relationship between 500 stocks of the S&P 500 index using the daily news from Reuters News dataset. The nodes specify the stocks and the hyper-edges contain **BERT embeddings** of the news articles mentioning multiple stocks in a day.
- Implemented a **Hypergraph Neural Network** based architecture in PyTorch which takes these generated hypergraphs as input. Hypergraphs over multiple days were passed through this network and fed into a **LSTM** layer which is followed by **attention and residual layers**. Finally the output was passed into a **shared classifier** which predicted the stock prices of all 500 stocks of the index.

Neural Machine Translation [Demo] [GitHub] *July 2020*

- Built and trained a **Neural Machine Translation** system from scratch in PyTorch. (**37 BLEU**)
- It uses a **Bidirectional LSTM Encoder** and a **Unidirectional LSTM Decoder** using Seq2Seq network with **attention** and hybrid character-level and word-level language modelling.

ACHIEVEMENTS

- Worked with the team (Project MANAS) which stood **World Rank 1** at the 27th Intelligent Ground Vehicle Competition (IGVC 2019) which is held at Oakland University Michigan, USA.
- Contributor to a team which **ranked first** among all the submissions for subtask-1(a) at the **SMM4H 2021** workshop which is co-located at **NAACL 2021**.
- Led a team of 3 to secure an **All India Rank 19** in the Flipkart GRiD 2.0 - level 1
- Led a team of 4 to secure **Rank 1** in Google Hash Code 2020 in Manipal hub, ranked 500 in India

TECHNICAL SKILLS

Programming	Python, C++, Java, C
Libraries & Tools	PyTorch, NumPy, OpenCV, Matplotlib
Experienced in	Natural Language Processing, Computer Vision, Deep Learning

EDUCATION

Manipal Institute of Technology Manipal
Bachelors in Technology *2018 - 2022*
Computer and Communication Engineering *CGPA: 8.49*

EXTRA CURRICULARS

YouTube Channel
Online Educator *June 2021 - Present*

· Owns and manages a research encouraging channel where I host **weekly discussions** on cutting edge research papers in the field of Deep Learning

Research Society Manipal
AI division mentor *Nov 2020 - Present*

· **Mentored** and **guided** several students to pursue research in the field of Deep Learning.
· Organization aims to promote research, provide resources and research guidance to students and form a stronger connection with professors and alumni.