Aniket **Didolkar**

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Education

Manipal Institute of Technology *Manipal, Karnataka, 576104*

BTech in Computer Science and Engineering *2016 - 2020*

- Maintained a CGPA of 9.22 / 10.0 upto the 6th semester.
- Received appreciation for academic excellence and Gold Medal (Dean's List) for scoring a GPA above 9.5 / 10.0 in the 3rd semester.

Experience

IISC Bangalore *Bangalore, India*

Research Intern *Jan 2019 - Present*

- Working under the guidance of Professor Aditya Gopalan on using Machine Learning for air quality prediction.

MIDAS Lab, IIIT Delhi *Remote*

Research Intern *April 2019 - Present*

- Working with Professor Rajiv Ratn Shah of IIIT Delhi on research problems in the domain of deep learning and natural language processing.
- Was the lead researcher in the project of **detecting hate-speech in Arabic**.
- In this project we used a corpus made of tweets. We extracted the graph of social interactions between the users using their following and retweeting activities. We used this social graph to generate author embedding using the **Node2Vec** algorithm and used it in combination with the sentence embedding obtained from the text using **LSTMs, GRUs** etc.
- This project has led to papers at **ACL-SRW 2019** and **ACM-HyperText 2019**.
- Currently working on the project of using **Mixup** as a data-augmentation technique for NLP to improve the performance of Bert on sequence classification tasks.

Google Summer of Code 2019 *Remote*

Student Developer *May 2019 - Aug 2019*

- Worked on building Recurrent Neural Network support for ChainerX.
- Implemented the following models - **UNI/BI-LSTM, UNI/BI-GRU, UNI/BI-Vanilla RNN, S-LSTM, Tree-LSTM (both forward and backward passes)**.
- Implemented both the CPU and GPU versions of the models. Learnt to use the **CUDNN** framework provided by NVIDIA to implement the GPU versions of the above models.
- All the models were implemented in C++. Used PyBind to provide a Python interface to call the C++ models.
- Wrote the relevant documentation for using the models.
- Final report is available here
- **Mentors final evaluation comments can be seen here**.

Ubisoft *Pune, India*

Automation Intern *May 2019 - July 2019*

- Worked on detecting **collision bugs**(When the car stops even when there is no visible obstacle in the path.) and **pass-through bugs**(When the car passes through a visible obstacle such as wall, tree, fence etc.) in the crew 2 game.
- Used the deeplab-v3 model for semantic segmentation.
- Used the model in this paper for depth estimation.
- Used OpenCV to extract the current velocity of the car from the game screen.
- Combined results from the above models to output a probability map for each frame which showed the pixel-wise probability of collision for the objects in the frame.
- My solution allowed the elimination of the tedious task of humans actually going through the game frames and detecting bugs manually.

Project Manas *Manipal, Karnataka*

Undergraduate Researcher *Feb 2018 - Feb 2019*

- Understood and implemented reinforcement learning algorithms - **DQN, policy gradients, and A3C** on the environments provided by OpenAI gym such as the gym-minigrid environment.
- Created a gym environment[code] based on the **Shapes Environment** as mentioned in this paper. Also implemented the TarMac algorithm mentioned in the same paper.
- Mentored 3 juniors for the task of designing a learning algorithm for the udacity self-driving car simulator.

Rammer.ai *Pune, India*

Data Science Intern *June 2018 - July 2019*

- Worked in the domain of natural language processing.
- Worked on the task of detecting **action-items** in meeting transcripts and natural language inference on the SNLI Dataset.
- Familiarized myself with a host of libraries and techniques used while working with text data.
- Implemented and compared the performance of various architectures **(Transformer, GRU+self-attention, LSTM+self-attention, GRU+universal sentence encoder, LSTM+universal sentence encoder)**. The results were well documented for comparison later.
- Implemented a natural language inference model (Dependent Reading Bi-LSTM) to detect contradictory action-items in a given meeting transcript.

Publications

Beyond Hostile Linguistic Cues: The Gravity of Online Milieu for Hate Speech Detection in Arabic [pdf]

Hof, Germany

Proceedings of the 30th ACM Conference on Hypertext and Social Media *September 2019*

- Authors - **Aniket Didolkar**, Arijit Ghosh Chowdhury, Ramit Sawhney, Rajiv Ratn Shah
- Was also awarded a student grant to travel to Hof, Germany to present the paper.

ARHNet-Leveraging Community Interaction for Detection of Religious Hate Speech in Arabic [pdf]

Florence, Italy

Proceedings of the 57th Conference of the Association for Computational Linguistics: Student Research Workshop *July 2019*

- Authors - **Aniket Didolkar**, Arijit Ghosh Chowdhury, Ramit Sawhney, Rajiv Ratn Shah

[Re] h-detach: Modifying the LSTM Gradient Towards Better Optimization [pdf] [code][interview]

ReScience C 5, 2, 1 *April 2019*

- Authors - **Aniket Didolkar**
- This paper was one of the 4(out of 24) papers accepted as part of the ICLR reproducibility challenge 2019.
- Successfully reproduced the paper - H-detach: Modifying the LSTM Gradient Towards Better Optimization.
- Also implemented the CUDA version of the algorithm and integrated it into the PyTorch ecosystem in my local computer. This resulted in a 2x speed-up.

Projects

Implementation of the paper - Recurrent Independent Mechanisms [code]

Personal *February 2020*

- Implemented the model presented in the paper - Recurrent Independent Mechanisms(RIMs) and reproduced the results for the MNIST task in the paper.
- Was able to demonstrate that RIMs generalize better to different environments by showing their improvements over LSTMs on the gym-minigrid environment using **Proximal Policy Optimization**.

BERT Baselines for COQA [code]

Personal *November 2019*

- Implemented BERT and its variants for the reading comprehension task of the COQA dataset
- The models include - **BERT, RoBERTa, DistilBERT, SpanBERT**

Parallel implementation of T-SNE [code]

Course Project *April 2019*

- Implemented a parallel version of the T-SNE algorithm using CUDA.

Pruning Neural Networks [code]

Personal *December 2018*

- Performed weight pruning and unit pruning on a simple fully-connected neural network. Showed that up to **90%** of the weights can be pruned without a considerable drop in accuracy.
- Utilized the sparsity of the weights to speed up inference by up to **30%**.

DeepJava [code]

Personal *September 2018*

- Deep learning operations developed from scratch in Java using the concepts of object-oriented programming.
- It builds a dynamic computation graph similar to PyTorch.
- It correctly handles optimization and gradient flow using the backpropagation algorithm for various operations defined in a computation graph (eg: convolutional layers, fully connected layers, sigmoid, softmax etc.).

CodeFlood [code]

Personal *November 2018*

- Built a website to speed up relief operations during floods. My work included extracting tweets from Twitter and running sentiment analysis on the tweets to determine whether the user was in a flood and then extracting the location of the tweet if he was in trouble. I also built a clustering algorithm that smartly assigns organizations running rescue operations to clusters of people to speed up the rescue.

AutoNLP [code]

Personal *June 2018*

- Implemented models for natural language generation and natural language inference(on SNLI Dataset). This was built in such a way that the user could easily test with different model architectures, hyper-parameters and datasets with minimal changes in the code.

Skills

Programming Python, Java, C/C++, C#, LaTeX
Frameworks PyTorch, Tensorflow, Chainer, CUDA, CUDNN, Numpy, OpenCV
OS Linux, Windows