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Publications

Microblog Retrieval for Post-Disaster Relief: Neural IR Models   NEUIR17
Accepted   *https://arxiv.org/abs/1707.06112*

> With the increased use of Neural Network techniques for Information Retrieval, a logical question is if we can use DNN, NN based Language models to retrieve relevant tweets from a large dataset. Due to small amount of data and increased amount of noise, it is relevant to pose this problem as that one of retrieval and get high precision and recall accuracies, rather than training classifiers over LM to get tweets which might be relevant. Try to speed up training, be reusing pretrained tweet structures. NeuIR is a workshop at the Conference Special Interest Group in Information Retrieval aimed specifically at Neural Network techniques for Information Retrieval.

Projects

Post Disaster Microblog Retrieval   May 2017 - July 2017
Microsoft Research India   *Aritificial Social Intelligence*
- Main focus was to build Neural Network methodologies (Deep + NLP) for retrieval
- Tested using biLSTM, attention based and other neural network methods (total : 5)
- The project aimed at building a retrieval mechanism for disaster situations
- The work involved retrieving relevant tweets and extracting information
- The model also involved matching tweets that could be of mutual benefit
- System design for a prototype level model to deploy the same

Unsupervised learning for Text to Video generation   February 2017 - November 2017
Supervisor : Prof. Vinay P. Namboodiri   *CSE Deptt., IIT Kanpur*
- The aim is to use learned word embeddings to generate video
- Built upon GANs (Goodfellow et al) and the work of Scott Reed (et al)
- Training done in Wasserstein GAN setting
- Used LSTM models to learn frame representations
- Used novel TreeGAN methods for alternative Generative model and representation learning

Optimizing MaxSAT and Inferring Grammars (COMPILERS / LOGIC)   May 2016 - July 2016
Supervisor : Prof. Subhajit Roy   *CSE Deptt., IIT Kanpur*
- Worked on building efficient algorithms to find MaxSAT instances using GPUs and Parallel programming
- Implemented algorithms with CUDA and tested against standard benchmarks
- Worked on abstracting LALR languages as Logic
- Implemented abstraction with z3 Python library

Advanced Track, ESC101 (FUNCTIONAL PROGRAMMING / SYSTEMS / AI)   January, 2016 - April, 2016
Supervisor: Prof. Sunil E. Simon   *CSE Deptt., IIT Kanpur*
- Creating an efficient Online Judge for Programs written in C/C++/Haskell
- Efficient use of concurrent programming and deployed using the Flask Framework
- Built parsers for LR(k) gramars with Haskell
- Built a system to check if grammar is LL(1) using efficient implementation of Parsing Algorithms
- AI for solved games with faster implementations taking advantage of Lambda Calculus

Talk on Error Correcting Codes (DISCRETE MATHEMATICS)   November 2016
Instructor: Prof. Nitin Saxena   *CSE Deptt., IIT Kanpur*
Delivered a talk on Error Correcting as an extra project, part of the discrete mathematics course. The talk aimed at familiarising the audience with Symmetric Channels and Linear codes and related mathematics it's direct application as seen in DNA.

Autonomous Underwater Vehicle (ROBOTICS)   November, 2015 - July, 2016
Supervisor: Prof. K.S. Venkatesh   *Electrical Engineering Deptt., IIT Kanpur*
- Aimed at moving the Bot along a line, firing torpedos at given targets and grabbing and dropping objects underwater
- Implemented using OpenCV for Image Processing and ROS for Controls
- Mechanical Design and Optimization with Ansys

Code / Libraries

NLP Libraries
Word2Vec (Lua/Torch)   *https://github.com/prannayk/word2vec.git*
- Word2Vec Library using Hierarchial Vocabulary trees for word vector representation
- Works for most English like languages where Context can be used for representation

Information Retrieval (Tensorflow)   *presently private*
- Implemented Neural network methods for information retrieval
- Trains on multiple models
- Generic codes for efficient asynchronous updates
- Generic codes for attention models
- Generic codes for LSTM models
- GPU implementations
- Cross model testing / multi module versatile implementation

Haskell Code   November 2015-May 2016
Online Judge   *hhttps://github.com/prannayk/conj.git*
- Haskell based online judge
- Used concurrent and parallel programming constructs
- Enabled judgement of code based on static test cases efficiently
- Front end deployde with Python

Present