Akshit Tyagi

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Education

Sept '18 - Present — Master of Science in Computer Science from **Univ. of Massachusetts, Amherst**
GPA: 3.96/4.0

May 2018 — Bachelor of Technology from **Indian Institute of Technology, Delhi**
Major: Electrical Engineering
GPA: 8.5/10

May 2014 — All India Secondary School Certificate Examination in Sciences
Delhi Public School, R.K. Puram
Aggregate Percentage: 97.0

Work Experience

May - August 2019 — **Applied Science Intern** at Alexa AI
Implicit Memory at Alexa Brain

- Tackled the problem of Conversational Question Answering in the context of agents like Alexa
- Worked on developing new techniques for dealing with noise in the question text, presented to Alexa from speech
- Designed noise-robust embeddings through stability training, while improving over the baseline of augmented training
- Worked on developing Adversarial training for noise-domain adaptation, as another implementation of robust embeddings

May - July 2017 — **Machine Learning Research Intern** at Amazon
CoreML & Self-Serviced Performance Ads

- Worked on designing, developing and deploying an auto-moderation system for book campaigns
- Designed a text based model to produce feature vectors for the given campaign from its custom text and description
- Developed and deployed an end-to-end training and testing pipeline for weekly training builds and live scoring of incoming campaigns
- Our model achieved a 25% replacement of manual moderation by auto moderation while the dip in accuracy of less than 1%

Publications and Posters

1. Fast Intent Classification for Spoken Language Understanding [arxiv 1912.01782 cs.CL]
   Akshit Tyagi, Varun Sharma, Rahul Gupta, Lynn Samson, Nan Zhuang, Zihang Wang, Bill Campbell
2. Conversational Question Answering and Noise Robustness
   Akshit Tyagi, Anjishnu Kumar, Abhinav Sethy

Programming Languages and Frameworks

Extensive:	Python, C, C++, Java, PyTorch, MATLAB, Keras, Tensorflow, Bash
Intermediate:	Caffe, Mathematica, sklearn, gensim, CUDA, OpenMP
Basic:	JavaScript, CSS, Android Studio, MPI

Research Projects

UMass Amherst with Prof. Marlin (Sept'19 - Present)

Calibrating and Speeding up Bayesian Learning of Neural Nets
Currently working on making bayesian learning of parameters for deep neural nets faster by using MCMC samples. Previous approaches using distillation have shown to be susceptible to large uncertainty in datasets. We plan to make such MCMC based models robust to larger uncertainty while being fast.

UMass Amherst with Prof. Fiterau (Sept'19 - Present)

Causal Inference Formalisms for Hierarchical Medical Diagnosis
Currently working on coming up with a formalism for hierarchical medical diagnosis in a causal inference setting. Previous approaches have either not taken advantage of hierarchical diagnosis models or have ignored it completely by using gaussian process. We aim to use different levels of diagnosis for additional information gain.

UMass Amherst & Amazon (Jan'19 - Aug'19)

Fast Inference in Deep language models for Intent Classification
Worked with Amazon's Alexa team on building an intent classifier
This will be integrated with the voice assistant as a tool to identify the intent of the utterance spoken by the user in a dialogue form. We were able to achieve a 20% reduction in effective model size while largely preserving model performance.

IIT Delhi (Jan'18 - May'18)

Transfer Learning in Memory Networks for Question Answering
Worked on coming up with a technique to transfer knowledge between different domains of question answering, as mentioned in the bAbI dataset.
End-to-End Memory Networks were used as the test for transfer learning and as a agent to answer questions in different domains. Model Initialization, Joint Training and Feature Extraction gave significant improvements.

Relevant Courses Taken

Computer Science	Parallel and Distributed Systems, Operating Systems, Reinforcement Learning, Computer Architecture, Artificial Intelligence, Probabilistic Graphical Models, Deep Neural Networks, Natural Language Processing, Systems
Electrical Engineering	Communication Engineering, Control Theory, Digital Logic and Electronics, Machine Learning, Deep Learning
Mathematics	Probability and Stochastic Processes, Statistical Inference, Linear Algebra and Differential Equations, Calculus

Awards, Grants & Honours

Design & Innovation Summer Award(DISA)	IIT Delhi(2015)
Institute Award for being a student in the top 7% in the first year	IIT Delhi(2014-2015)
National Talent Search Examination 2010	NCERT(July 2010)
KVPY Fellowship 2012-13	Dept. of Sci. & Tech.(2013)
Indian National Chemistry Olympiad 2014, Top 50	HBCSE(Feb 2014)
Junior Science Talent Search Examination 2011, 2nd Position	Govt. of Delhi(July 2011)