Darshan Thaker

Curriculum Vitae

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Education

2017-2019   **Master of Science, Computer Science**, *The University of Texas at Austin*, Austin, TX, *GPA: -*.
Integrated 5-year BS/MS Program

2014–2018   **Bachelor of Science, Computer Science**, *The University of Texas at Austin*, Austin, TX, *GPA: 3.81 / 4.0*.
Turing Scholars Honors Student

2014–2018   **Bachelor of Science, Mathematics**, *The University of Texas at Austin*, Austin, TX, *GPA: 3.81 / 4.0*.
Concentration in Pure Mathematics

Research Experience

2017 –   **Deep Learning for NLP**, *Professor James G. Scott*, Austin, TX.
- Working towards undergraduate honors thesis on using probabilistic natural language models for biomedical question answering (QA)

Work Experience

Summer 2017   **Software Engineering Intern**, FACEBOOK INC., Menlo Park, CA.
- Worked on WPR (Whole Page Ranking) for Facebook Search on improving ranking of modules (Pages, Groups, People, etc.)
- Introduced new C++ API for module interleaving that allows quick prototyping of different strategies to interleave modules on the Search Engine Result Page
- Trained new result-level ranking machine learning models and integrated them into the Search pipeline to rank and split modules using this ranker

Summer 2016   **Software Engineering Intern**, GOOGLE INC., Menlo Park, CA.
- Worked on the HULK (Holistic User-Location Knowledge) team on online segmentation (classifying location points as stationary or moving)
- Set up a pipeline to tune hyper-parameters of the segmentation algorithm
- Adapted the algorithm from a heuristic-based clustering approach to one that uses machine learning
- Created an efficient C++ pipeline that allowed generation of training data, modular feature computation and evaluation in model, and evaluation of results
- Experimented with different interpretable models and added ≈ 30 new features

Summer 2015   **Machine Learning Intern**, SYMANTEC: CENTER FOR ADVANCED MACHINE LEARNING, Mountain View, CA.
- Collaborated with a mentor to develop a robust machine learning classifier using gradient boosted decision trees to identify targeted malicious e-mail attacks
- Explored feature engineering steps such as using spectral clustering for identifying clusters of criminal networks sending out similar email attachments or using Latent Dirichlet Allocation (LDA) for topic modelling, resulting in a 83% accuracy classifier
- Project selected as one of top 12 company-wide projects from a group of ≈ 200 interns

Summer 2013/14   **Software Engineering Intern**, OPEN NETWORKING LAB, Menlo Park, CA.
- Worked with a team of 3 engineers to implement a fat tree network topology compatible with Mininet, a Python-based virtual network emulator
- Developed test cases and fixed bugs for the Flowvisor tool, a virtual network hypervisor

Projects

One-shot Learning for Action Recognition.
- (In-progress) Using memory-augmented neural networks on videos to perform one-shot learning for action recognition

Yearbook Age Prediction.
- Trained an ensembled deep convolutional neural network in Tensorflow following VGG19 and AlexNet architectures to predict year in which a yearbook photo was taken
- Achieved an average distance of 5.54 years from ground truth year on test set

Visual Semantic Planning.
- Implemented deep successor network in Tensorflow with both imitation learning and reinforcement learning training for visual semantic planning in a toy MDP domain
- Follows paper *Visual Semantic Planning Using Deep Successor Representations* - Zhu et al. 2017

Conflict Graphs for Parallel Stochastic Gradient Descent.
- Exploration of various conflict graphs to parallelize stochastic subgradient descent in the context of Support Vector Machines using PEGASOS algorithm

Ising Model.
- Implemented basic simulation of generative 2-D and 3-D Ising model

Parallel Adaptive Boosting.
- Implemented a parallel version of the Adaptive Boosting (AdaBoost.MH) algorithm in the C++ Multiboost Library, resulting in a 2.7x speedup

Gmail LDA.
- Implemented clustering of e-mails into topics using Latent Dirichlet Allocation (LDA) from the Python gensim library

Automatic Music Generation.
- Implemented a Markov chain in Java that is trained on sequence of music notes to generate somewhat melodious music

Selected Coursework

Graduate

- EE 381K - Convex Optimization (Dr. Constantine Caramanis)
- CS 395T - Deep Learning Seminar (Dr. Philipp Krähenbühl) [*In progress*]
- CS 381V - Visual Recognition (Dr. Kristen Grauman) [*In progress*]

Undergraduate

- CS 342 - Neural Networks (Dr. Philipp Krähenbühl) [*In progress*]
- CS 378H - Machine Learning/Vision: Honors (Dr. Kristen Grauman)
- CS 343 - Artificial Intelligence (Dr. Scott Niekum)
- CS 378H - Distributed Computing: Honors (Dr. Lorenzo Alvisi)
- CS 331H - Algorithms and Complexity: Honors (Dr. Eric Price)
- CS 377P - Programming for Performance (Dr. Sreepathi Pai)
- CS 356 - Computer Networks (Dr. Simon Lam)
- CS 439H - Principles of Computer Systems: Honors (Dr. Ahmed Gheith)
- SDS 325H - Honors Statistics (Dr. James Scott)
- M 373K - Algebraic Structures I (Dr. Sean Keel) [*In progress*]
- M 361 - Theory of Functions of Complex Variable (Dr. Duncan McCoy)
- M 365C - Real Analysis I (Dr. Hector Lomeli)
- M 427L - Vector Calculus (Dr. Bart Goddard)
- M 340L - Matrices and Matrix Calculations (Dr. Eric Korman)
- M 362K - Probability I (Dr. Dave Rusin)
- M 378K - Intro to Mathematical Statistics (Dr. Stephen Walker)