Ben Athiwaratkun

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EDUCATION

Cornell University

Third Year Phd Candidate in Statistics and Special Masters in Computer Science
Advisor: Andrew Gordon Wilson

Williams College

Bachelor of Arts in Mathematics and Economics with Honors in Mathematics, June 2012
- Benedict First Prize in Mathematics 2010, Magna Cum Laude, Phi Beta Kappa and Sigma Xi

RESEARCH EXPERIENCE

Multimodal Word Embedding (paper pending)   **Fall 2016 - Present**
- Exploring the use of multimodal distribution as word representation to capture meaning multiplicity of words.

Neural Language Model for Malware Classification (ICASSP 2017)   **Summer 2016**
- Applied neural language models (LSTMs, GRUs) to sequences of APIs to extract file features.
- Experimented with multiple attention mechanisms on sequences of API features for malware file detection.
- Paper accepted to ICASSP 2017.

Sentence Manifold Traversal (paper pending)   **Spring 2016 - Present**
- Exploring sentence generation by traversing the manifold of sentence space for semantic changes.

Adversarial Deep Averaging Networks for Cross-Lingual Domain Adaptation (ArXiv) Spring 2016
- Developed a model for domain adaptation between languages using adversarial training
- Experiments on English to Chinese sentiment classification show that our method significantly outperforms baselines such as a machine translation system.

Feature Representations in Convolutional Neural Networks (ArXiv)   **Spring 2015**
- Exploring properties of features from convolutional neural networks as input for other machine learning classification models such as random forests and support vector machines for image classification and human activity recognition.
- Using CNN features to perform clustering on plankton images to obtain a graphical taxonomy and using DeConvolutional network to visualize CNN features.

Predicting Code-Switching in Tweets   **Fall 2014**
- Developed a model to predict code-switching instance (Thai-English) in tweets using part of speech analysis and bag-of-words model to train a classification with sparse design matrix (1M x 100K).
- Analyzed significant words as predictors of code switching occurrence.

RELEVANT WORK EXPERIENCE

Research Intern   **Summer 2016 (Microsoft Research, Redmond)**
- Experimented with neural language model and attention mechanism, as well as character level convolutional neural networks for malware detection.

Research Intern   **Summer 2015 (Loop AI Labs, San Francisco)**
- Trained recurrent neural network language models (RNN, GRU, LSTM) on large dataset to improve the semantics of embeddings for relationship extraction tasks
- Comparing word embeddings trained by multiple models such as word2vec, GloVe, WordRep, as well as embeddings evolved by supervised learning such as tree LSTM for relationship extraction

MACHINE LEARNING PROJECTS

Heuristics Optimization for Neural Network Training   **Fall 2014**
- Explored the use of simulated annealing, genetic algorithm, and dynamically dimension search for neural network training.

Book Rating Prediction   **Spring 2014**
- Used a probabilistic matrix factorization algorithm with collaborative constraint to predict book rating.

Movie Revenue Prediction   **Spring 2014**
- Developed a neural network model with tailored cost function to perform movie revenue prediction.

Swingy Monkey - Reinforcement Learning   **Spring 2014**
- Developed a Q-Learning algorithm to train an agent to play a game (swingy monkey). The model successfully trained the agent to become increasingly more competent over time.

Pacman Tournament   **Spring 2014**
- Used support vector machine, Kmeans++, and state machine algorithm for Pacman Final Project Tournament. Won 2nd place of all teams (Harvard CS181)

RELEVANT COURSEWORK
- Machine Learning, Heterogeneous Parallel Programming, Natural Language Processing for Social Interactions, Heuristics Optimization, Advanced Machine Learning, Database, Computer Vision

AWARDS
- International Physics Olympiad 2007, Silver Medal

TOOLBOXES
Deep Learning Tools: Torch, Theano, Pylearn2, Tensorflow
Programming Languages: Python, Lua, R, Matlab/Octave, Java, C++, C, SQL

PROFILE
LinkedIn: www.linkedin.com/in/benathi
Git: www.github.com/benathi
Personal Website: www.benathiwaratkun.com