Ben Athiwaratkun

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EDUCATION

Cornell University
Fifth 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

Loss Surfaces and Knowledge Distillation in Domain Adaptation (Under Review at CVPR 2019)
- Analyzing loss surfaces and the efficacy of averaged weights on source and target domains.
- Improving domain adaptation results by exploiting teacher knowledge.

Improving Stability in Deep Reinforcement Learning with Weight Averaging (UAI workshop, 2018)
- Improving deep reinforcement learning results with weight averaging.

There Are Many Consistent Explanations of Unlabeled Data: Why You Should Average (ICLR 2019)
- Explore weight averaging methods to improve semi-supervised learning on image classification. Achieved state-of-the-art in all label categories on CIFAR-10 and CIFAR-100.

An Exploration of Bayesian Methods for Auto-Encoders (In Progress)
- Exploring different formulations of Bayesian approach on variational autoencoders, with application for diverse sentence generation and semi-supervised learning.

Adversarial Deep Averaging Networks for Cross-Lingual Domain Adaptation (TACL 2018)
- 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.

Probabilistic FastText for Multi-Sense Word Embeddings (ACL 2018)
- Developed a method that incorporates subword information to enhance the quality of word density representations.
- Our model can handle rare or out-of-vocabulary words, and be applied to other languages without further hyper parameter tuning.

Hierarchical Density Order Embeddings (ICLR, 2018)
- Developed a methodology to train Gaussian representations on hierarchical data.
- Achieved state-of-the-art for WordNet hypernym prediction and HyperLex lexical entailment

Multimodal Word Distributions (ACL, 2017)
- Exploring the use of multimodal distribution as word representation to capture meaning multiplicity of words.

Neural Language Model for Malware Classification (ICASSP 2017)
- 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.

RELEVANT WORK EXPERIENCE

Research Intern **Summer 2017 (AWS AI Lab, Palo Alto)**

- Explored the idea of balancing dictionary-level and word-level representations for word embeddings using group sparsity regularization.
- Pivoted the idea and applied the subword structure to multimodal word distributions.

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. Published a paper to ICASSP 2017.

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

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, Tensorflow, PyTorch
Programming Languages: Python, Lua, R, Matlab/Octave, Java, C++, C, SQL

PROFILE

LinkedIn: www.linkedin.com/in/benathi **Github**: www.github.com/benathi
Personal Website: benathi.github.io **Google Scholar**: www.goo.gl/tuD8H4