Markus Woodson

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Current graduate student looking for a place where I will learn something new everyday and be pushed by my peers to be better. Always looking for a challenge and difficult problems to solve. Research interests include deep learning, unsupervised learning, and how they can be used to help process video data

Work Experience

Summer 2016 — **AiCure - Computer Vision Research Intern**
Applied computer vision methods to the task of pill recognition in low resolution images with obstruction of pills. Also applied deep learning and one-shot learning concepts in the practical area of pill recognition with very little images

Spring 2016 — **Carnegie Mellon Cylab - Research Intern**
Research and development in using deep learning for full scene pedestrian detection without sliding window or cascade

Summer 2015 — **Hudl - Data Science Intern**
Developed analysis tools for coaches and players in soccor games using neural networks, logistic regression and expectation maximization. Used tools such as Spark and Hadoop to handle big data.

Teaching Experience

Fall 2016 — **Mathematical Background for Machine Learning Teaching Assistant**
Responsible for creating lecture material, developing and creating homeworks, and holding weekly office hours.

Fall 2014 — **Computational Perception Teaching Assistant**
Developed homeworks, graded assignments and quizzes and held weekly office hours

Education

2016 - Current — **MS Electrical and Computer Engineering - Carnegie Mellon University**
2012 - 2016 — **BS Electrical and Computer Engineering - Carnegie Mellon University**

Skills

- Python
- C++
- CUDA
- Spark / Hadoop
- MPI / Open MP
- Theano
- Torch
- scikit-learn

Projects

Security Quadcopter

Using gait and facial recognition, my group and I programmed a quadcopter to recognize people by their face and by the way they walk.

3-Stream Recurrent Neural Network for Action Recognition

Developed a 3 stream approach to action recognition in videos. Combined both frame-level and temporal information by using optical flow features and RNN in one of the streams. We employed cropping and sub-sampling of features in such a way to not decrease performance but save computation time.

Improving Neural Network Training Speed

Got near 130X speedup in deep neural net training using FFT and parallelization for Intel CPU's. Had half of the memory usage compared to similar FFT approaches at time of development.

Kaggle WhatsCooking Competition

Placed in the top 150 for the WhatsCooking Kaggle competition. Final model was a wide and shallow neural network using TFIDF features from stemmed ingredient lists.