

Nathan Starliper

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SUMMARY: Professional engineer turned Ph.D. student with 5+ years industry experience seeking internship in machine learning, computer vision, data science, or robotics for Summer 2019.

EDUCATION

North Carolina State University, Raleigh, NC

Expected 05/2022

Ph.D. Electrical Engineering, Advisor: Dr. Edgar Lobaton

Research Focus: Machine Learning, Computer Vision

GRE: Q-170, V-164, GPA: 3.96/4.0

Awards: College of Engineering Dean's Graduate Fellowship 2017-2018 \$30,000/year academic merit fellowship

Relevant Courses: Machine Learning and Pattern Recognition, Computer Vision, Neural Networks, Random Processes, Estimation and Detection Theory, Digital Imaging Systems, Functional Analysis, Geometry of Curves and Surfaces

Virginia Commonwealth University, Richmond, VA

05/2012

Bachelor of Science in Electrical Engineering, Minor: Physics, Mathematical Sciences

Honors: Magna Cum Laude, GPA: 3.84/4.0

Awards: Full tuition academic merit-based 4-year scholarship and additional \$3,500/year academic 4-year scholarship

TECHNICAL SKILLS

Languages: Python, MATLAB, R, C/C++, VB, Ladder Diagram/FBD/ST (PLC)

Tools/Frameworks: TensorFlow, Keras, Sci-Kit Learn, Sci-Kit Image, OpenCV, NumPy, Pandas, Hyperopt, Git, Bash, PyCharm, Jupyter Notebook, Conda, Linux, LabVIEW, ControlLogix, FactoryTalk, AutoCAD

RESEARCH/TECHNICAL PROJECTS

Activity-Aware Wearable System for Power-Efficient Prediction of Physiological Responses, Sensors 2019

- Lead research collaboration with NSF ASSIST Center to develop personalized and activity aware group lasso models for power efficient heart rate (HR) prediction from multi-modal wearable data streams
- Extracted temporal and spectral features using sliding window and data fusion from multiple sensors
- Activity recognition using LPP dimensionality reduction and k-means clustering
- Developed prediction models using weighted group lasso and nonlinear SVM, wrote code for special cross validation method required for this specific data

Terrain Identification for Use in a Lower Limb Prosthesis

- Built deep convolutional neural networks for terrain identification with 96.5% prediction accuracy, compared results to fine-tuned ResNet model using transfer learning techniques
- Incorporated Bayesian hyperparameter optimization and compared with grid and random search
- Implemented terrain identification on the Jetson TX2 embedded GPU using linear binary patterns feature extraction and random forest classification

LSTM Recurrent Neural Network for Language Modeling

- Built LSTM neural networks for text generation trained on the Penn Treebank dataset
- Developed both character and word level models in both TensorFlow and Keras

Variational Autoencoders for Text Generation

- Built variational autoencoders in Keras using both MLP and CNN networks and trained on the MNIST dataset
- Used the trained models to generate images of "handwritten" digits

Laplacian Blob Detector

- Implemented a Laplacian of gaussian filter without use of built-in functions for scale invariant blob detection
- Built Laplacian scale space and separable convolutions for gaussian filters without use of Python library functions

Feedforward Neural Network and Naïve Bayes for Classification of Faces and Handwritten Digits

- Developed implementations of a feedforward neural network and a Naïve Bayes classifier without the use of built-in functions for classification of Extended Yale B face and MNIST handwritten digit datasets
- Implemented histogram of oriented gradients for feature extraction, and PCA with sequential forward selection for feature selection and dimensionality reduction

- Developed code for 5-fold cross validation of models

PROFESSIONAL EXPERIENCE

Automation Engineer, Pro Mach, Moorestown, NJ

06/2015-07/2017

- Developed software for PLC, HMI, motion control, and machine vision using Rockwell suite and various vision systems for industrial robotics used in Pharmaceutical manufacturing and serialization.
- Customer-facing lead engineer on multi-disciplinary capital projects across the United States and Puerto Rico
- On-site installation, debug, validation, and qualification in FDA regulated manufacturing plants

Electrical Controls Engineer, Climatic Testing Systems, Hatfield, PA

02/2014-06/2015

- Developed software for analog PID loop drive control, digital control and HMI/SCADA interfacing
- Customer-facing project engineer: installed and validated PLC/SCADA software at Pharmaceutical and Automotive manufacturing plants
- Developed full electrical schematic package in AutoCAD

Senior Associate Engineer, Altria, King of Prussia, PA

06/2012-12/2013

- Designed solutions in factory optimization and process improvement for PLC control systems and factory SCADA systems specializing in the Rockwell software suite.
- Developed/implemented an automated camera vision system for non-conforming product detection
- Implemented factory instrumentation, measurement, and test equipment calibration and maintenance program detailing the calibration, verification, and standards certification of over 100 pieces of instrumentation