Robert Mash
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Objective

A science-driven researcher focused on the theory of deep learning and its application to important problems. Seeking a transition from active duty military service to a technical and intellectually engaging role in the private sector. Four years of direct experience implementing and evaluating deep learning algorithms preceded by many years of technical and engineering experience in small business and military settings.

Education

Air Force Institute of Technology, March 2017
- Master of Science, Electrical Engineering, GPA – 3.75
- Graduate Certificate in Autonomy
- Strong focus on theory and application of signal processing & deep learning

Ohio University, May 2012
- Bachelor of Science, Electrical Engineering
- Minor, Mathematics

Horry-Georgetown Technical College, April 1998
Associates, Electronics Technology

Experience

Developmental Engineer - United States Air Force
August 2011- March 2020 (reverse order)

AFRL - Autonomy Capability Team: (Feb 2018 - Present)
- Realizing and evaluating deep learning technologies in a Linux-Python-Pytorch-Nvidia development environment
- Member of small R&D team utilizing modern, collaborative, software development tools and practices
- Perform significant literature review in the areas of CNNs, LSTMs, GANS, deep reinforcement learning, uncertainty quantification, etc.
- Gather, wrangle, package, and process multi-modality data as needed
- Supporting organizational goal of realizing communication & deliberation between artificial neural-network based agents

AFRL/RY (March 2017 – Feb 2018)

- Applied research in Convolutional Neural Networks (CNNs) for electro-optical Automatic Target Recognition (ATR) using Tensorflow/Keras
- Significant coding experience in DoD HPC/PBS environment
- 2 years mentoring at AFRL's ATR-Center leading MS student in studies of inverse & differentiable computer graphics
- Awarded $50k budget from RY Director's Corporate Venture Fund to perform fundamental research in neural systems information representation

AFIT (Aug 2015 – March 2017)

- Completed signal processing and machine/deep-learning graduate sequences
- Explored CNN implementation strategies in the context of autonomous aerial refueling:
  - Classifier performance optimization over hyper-parameters using Caffe
  - Relationship between data augmentation techniques and parameter-space decision boundaries
  - CNN ensemble combination techniques
  - Transfer learning with compression/distillation using teacher-student networks
  - Decision framework construction using uncertainty estimator channel

Air Force SEEK EAGLE Office (October 2012 — July 2015)

- Applied Computational Electromagnetics codes to the analysis of aircraft-store compatibility
- Utilized COTS (CST Microwave Studio) and government owned codes: GEMACS
- Developed data conversion and visualization tools (MATLAB / Python)
- Performed extensive formal technical writing of engineering analyses

Engineering Technician - Global Cooling Inc., Athens, OH
2003 - 2011

- Sole electronics designer for small Stirling machine R&D company
- Developed, tested, and documented dozens of custom embedded solutions to support development of Stirling-cycle machines
- Applications ranged from last-mile ultra-low temperature freezers for vaccine transport to down-well oil exploration solutions
- Supported company-wide transition from R&D to product manufacturing
- During these years, completed the bulk of a BSEE as a part-time, non-traditional student
- Eight years of skill building in multiple areas:
  - Mixed analog and digital signal processing
  - Embedded software development
  - Touch-screen user interface design
  - Printed wire board design, layout, prototyping
  - Motor controller EMI/EMC mitigation techniques
  - Lab equipment research, procurement, maintenance
  - Design for X (research, manufacturing, production-support)
  - Product documentation and customer support
  - Quick response production line engineering support

Electronics Technician - External Power LLC., Athens, OH
2000-2003

- Performed design, assembly, and maintenance of custom SCADA systems
- Integral support of Stirling engine commercialization program

Maintenance Electrician - Century Aluminum Corporation, Ravenswood, WV
2000

Electronics Technician - Carolina Assemblies Incorporated, Conway, SC
1998-2000

Publications

Improved Aircraft Recognition for Aerial Refueling through Data Augmentation in Convolutional Neural Networks, International Symposium on Visual Computing (ISVC) 2016

Toward Aircraft Recognition with Convolutional Neural Networks, IEEE National Aerospace and Electronics Conference (NAECON) 2016

Yongrak Kwon, Robert Lee Mash II, "Method for use in Controlling Free Piston Stirling Coolers and Heat Pumps Driven by a Linear Alternator", US 8,952,635, U.S. Patent and Trade Office, February 2015

Experience with:

- Python 2 & 3
- MATLAB / Simulink
- Java
- C
- R
- National Instruments LabVIEW
- Pytorch
- Keras
- Tensorflow
- Berkeley Caffe
- Git
- Confluence
- Linux / Bash
- PBS
- Pip / Conda (some packaging)
- LaTeX
- Blender
- CST Microwave Studio
- GEMACS