Michael K. **Arnold**

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Summary

- Proven track record with a history of innovation.
- Experience designing complex systems with resource constraints.
- A wide range of machine learning experience.

Experience

Adtran

Huntsville, Alabama, USA

Software Engineer, Artificial Intelligence Group — *2017-2018*

- Artificial Intelligence applied research with a focus on troubleshooting layer 1 and layer 2 issues on GPON, NGPON2, and VDSL deployments.
- Artificial Intelligence platform development
- Work includes Generative Adversarial Networks, Autoencoders, Support Vector Machines, Decision Trees, Bayes Nets, Reinforcement
- Learning, and Feed Forward Neural Network Classifiers
- Won Innovation and Improvement Week Competition at ADTRAN three out of four times.
- Work led to the filing of two patents (currently pending).

Software Engineer, Reusable Component Development — *2016-2017*

- Tool Development for C.I. Pipeline
- Development of re-usable components common across multiple products. Work includes development of ADTRAN's Mosaic OS Linux distribution and NETCONF stack.

Software Engineer, Embedded Systems Development — *2011-2016*

- Developed and maintained AOS (ADTRAN Operating System) including Kernel and Network Devices
- Developed and maintained network protocols and network interfaces. Work includes BGP, OSPF, Metro Ethernet, IPSec, and Network Function Virtualization.
- This work led to the filing of a patent (currently pending) related to IPSec Selectors

Auburn University

Auburn, Alabama, USA

Graduate Research Assistant — *2009-2011*

- Worked on a computational ethnography tool written in python
- Automatic hypothesis generation and experiment testing using meta-heuristics such as Genetic Programming and Ant Colony Optimization.

Auburn University

Auburn, Alabama, USA

Undergraduate Research Assistant — *2008-2009*

- Social network graph visualizations
- Preliminary data analysis using metrics such as centrality and density

Education

University of Sydney

Sydney, NSW, Australia

Ph.D. In Complex Systems — *2018-PRESENT*

University of Alabama in Huntsville

Huntsville, Alabama

M.S. In Computer Science — *2015-2017*

- Thesis: Predictive networking and optimization for flow-based networks.
- GPA: 3.5 out of 4.0
- Focus in Machine Learning

Auburn University

Auburn, Alabama

B.SwE. In Software Engineering — *2007-2011*

- GPA: 3.62 out of 4.0
- Magna Cum Laude

Programming Languages and Skills

Programming Languages	Python, R, C, C++, Java, Cuda
Machine Learning	Neural Networks, Agent Based Modeling, Deep Learning, Decision Trees, SVMs, Reinforcement Learning
Dev-ops	Docker, AWS, Jenkins

Honors & Awards

Adtran

December, 2017 **3rd Place, Best Innovation**, One-Class Support Vector Machine (SVM) with a multi-class classifier for labeling and troubleshooting build failures

May, 2017 **1st Place, Best Innovation**, Classifying encrypted payloads using deep neural networks.

December, 2016 **1st Place, Best Innovation**, A Convolutional Neural Network for feature detection in packet processing systems.

July, 2015 **1st Place, Best Innovation**, Flow Utility Prediction Using Recurrent Neural Networks

Publications

1. J. Lyon, M. Arnold, and R. Raghavendra. Telecommunications network troubleshooting systems, U.S. Patent 10,716,017, Jul. 2020. URL `https://patents.justia.com/patent/10716017`
2. A. Nokbak, S. Knight, M. Arnold, R. Raghavenda, J. Lyon, V. Kosuri, and Z. Whaley. Artificial intelligence optimized telecommunications systems, U.S. Patent App 15/952,887, Oct. 2019. URL `https://patents.justia.com/patent/20190318238`
3. M. Arnold and T. Pearson. Ipsec selector coalescing for per-host security associations, U.S. Patent App 15/886,586, Feb. 2018. URL `https://patents.justia.com/patent/20190238522`
4. M. Arnold. Predictive networking and optimization for flow-based networks. Master's thesis, University of Alabama in Hunstville, 2017. URL `https://arxiv.org/pdf/1707.06729.pdf`
5. M. Arnold, D. Shenviwagle, and L. Yilmaz. Scibrowser: A computational ethnography tool to explore open source science communities. In *Proceedings of the 48th Annual Southeast Regional Conference*, ACM SE '10, pages 26:1–26:6, New York, NY, USA, 2010. ACM. ISBN 978-1-4503-0064-3. doi: 10.1145/1900008.1900045. URL `http://doi.acm.org/10.1145/1900008.1900045`