Pavel Komarov

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EDUCATION

Georgia Institute of Technology, Atlanta, GA **2011 – 2017**

- MS Electrical and Computer Engineering, extra CS and bioscience, 4.0 GPA 2015 – 2017
- BS EE, CS minor (Machine Intelligence), extra natural science, 4.0 GPA, Highest Honors 2011 – 2015

EXPERIENCE

Northrop Grumman – Melbourne, FL **2017 – Present**

- Advanced Battle Management Systems: Creating a system to identify anomalous aircraft from flight tracks and improve quality of combat identification as part of a new concept released by DARPA and the Air Force 2018 – 2019
- Algorithms, Common Open Mission Software Architecture: Wrote leaners from scratch, investigated relationships in data, created an automatic end-to-end pipeline to find best model with Bayesian Optimization, designed and wrote a fast database on top of memory-mapped arrays, wrote a module to recursively parse out data from arbitrary objects 2017 – 2018

Microsoft – Mountain View, CA – Intern, Outlook Team **2014 & 2015**

- Developed a strategy to detect stuck Exchange mobile clients and recover them with a state reset 2015
- Created the first platform for discovering insights about Outlook users by examining mailbox content 2014

Georgia Institute of Technology – Teaching Assistant **2012 – 2017**

- Signals and Systems & Digital System Design - School of Electrical and Computer Engineering 2015 – 2017
- Object Oriented Programming in Java - College of Computing (lots of debugging students' code) 2013 – 2015
- Calculus II/III Teaching Assistant and Math Tutor - School of Mathematics (teaching on my own) 2012 – 2013

Georgia Institute of Technology – Research Assistant **2012 – 2016**

- Yi Lab, Biology: Applied ML techniques (mostly feature reduction) to look for patterns in high-dimensional epigenetic microarray data and classify samples as diseased vs not diseased 2016
- Starner Lab, Human Centered Computing: Designed, assembled, and programmed a wearable rehabilitation device 2016
- Stanley Lab, Biomedical Engineering: Developed a tool to put data in Neurodata Without Borders format 2016
- Filler Lab, Chemical Engineering: Studied plasmon resonance in Si nanowires, used cleanroom equipment 2012

SKILLS

- *Machine Learning*: Numerous projects. Neural Nets, Boosting, Decision Trees, RL, Bayesian inference, and so much more.
- *Java*: TA for two years (recitations, grading, office hours), personal projects: picture sorter, a rating system, minesweeper
- *Python*: My primary language at NG, Artificial intelligence projects, familiar with sklearn and common packages, parsers
- *C/Microcontrollers*: Devised a suite of middleware functions, numerous linear control algorithms for a lab course.
- *MATLAB*: Prototyping control systems, brain simulations, a machine learner for Computer Vision, and more
- *Control Systems/Robotics*: Designed and implemented motor controllers on real hardware, simulated control of swarms and nonlinear control. Executed SLAM on a small mobile robot. Derived robot spatial equations.
- *Signal Processing*: Convolution, norms and vector spaces, coded Kalman Filter and Conjugate Gradient Descent.
- *Front-end Web*: Currently working through Eloquent JavaScript (book), a few Courseras, and building my own site

PROJECTS

Projection Pursuit Regressor and Classifier – For Fun **2018**
Found a paper generalizing a ML model I used for work and decided to investigate. I particularly recommend my explanation of how it works linked from the readme: https://github.com/pavelkomarov/projection-pursuit

Automatic Trader – Machine Learning for Trading **2016**
Extracted technical indicators from market data, fed to machine learner, invented a trading strategy to utilize predictions, and simulated. Performed Mean Variance Portfolio Optimization. Also tried a Reinforcement Learner to find optimal action.

Table-Digitizer – Computer Vision **2014**
Forged an Extreme Learning Machine in Matlab using academic literature alone and trained it to classify CIFAR-10. Part of a project to make a computer capable of reading and digitizing hand-written spreadsheets.

Model of Object and Direction Selective Neural Response using Deep CNNs – Info. Proc. in Neuro **2017**
Trained a CNN autoencoder on image patches, some overlaid with a grey ball that moved from input to output. Demonstrated that by stacking the two halves and passing each the proper frame, we could cause elements of the low-dimensional representation to become highly active, analogous to direction-selective motion-sensitive neurons in the frontal eye field.

HW/SW systems programming – GT Solar Racing, Electrical Team **2013 – 2014**
Programmed TIC2000 microcontroller to communicate with a Digi Xtend wireless module via SCI. Wrote a Java program to read serial data from a corresponding module connected to a PC. Created extensible libraries for subsystems like GPIO, SCI, Clocks, and ADC to make building complex programs easier. https://github.com/pavelkomarov/TI-C2000-middleware