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| Scott D. Graham   |  |  |  | | --- | --- | --- | | 7 Ronaele Rd, Medford, MA 02155 | [scott.d.graham@gmail.com](mailto:scott.d.graham@gmail.com) | cell: 617.803.5265 | |

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| **EDUCATION** | **University of Oklahoma** | **Norman, OK** |
| 1996 – 2003 | **Degrees:** Master of Science in Electrical Engineering, GPA 4.0/4.0Bachelor of Science in Electrical Engineering Minor in Mathematics  **Focus:** Embedded Systems Programming and Robotics  **Courses:** Applied Statistics, Numeric Analysis, Digital Signal Processing, Math Models  **Leadership:** Team lead for OU Battlebots entries, Chair of OU IEEE society |  |

**SKILLS** Machine Learning, Modeling and Simulation, Data Analysis and Visualization, Probability and Statistics, Software Architecture, Agile Development, Technical Leadership

**PROGRAMMING** **Languages**: Python, Java, PHP, SQL, Matlab

**Tools**: Git, SVN, Jira, Arcanist, Phabricator

**Agile Processes**: Scrum, Kanban

**TOOLS** **Machine Learning**: Vowpal Wabbit, Scikit-Learn, XGBoost

**Big Data**: Spark, Hadoop, HDFS, Kafka

**Data Analysis / Visualization**: Pandas, Numpy, Flask, Matplotlib

**Misc**: Linux, OSX, Windows, Office

**LINKS** gramhagen.github.io

**WORK Nanigans**

**EXPERIENCE Senior Software Architect – Data Science / Optimization 2013 – Present**

* Design, develop, and deploy algorithms to provide accurate estimates of ad values and optimized campaign spend across ads for hundreds of clients using thousands of models.
* Design full-stack modeling infrastructure for real-time bidding: EDA, ETL, feature selection / transformation, training, calibration, testing, and deployment of models. Leveraging distributed computing and rapid model training and prediction for large-scale fine-grained data sets
* Build model prediction service to provide sub-second predictions for Vowpal Wabbit and SK-Learn models
* Develop regression and classification machine learning models to provide estimates for user behavior
* Create a model analysis framework and dashboard to support fast iteration on model experimentation
* Technology evangelist to elevate team code quality and processes: new technologies, testing, microservices, distributed task scheduling, reproducible results and visualization of models
* Provide architectural review and guidance to other data scientists to ensure effective development and deployment of algorithms and features

**Raytheon Integrated Defense Systems**

**Systems Architecture Design and Integration Directorate 2003 – 2013**

**Modeling & Simulation Lead**

* Manage multi-disciplinary teams for multiple efforts developing software systems to demonstrate capability for autonomous target tracking, data fusion and classification
* Produce detailed technical plans, budgets, and schedules. Assess progress regularly and develop mitigation plans to ensure end product meets ever changing customer specifications
* Lead teams through all aspects of technical design, writing requirements, developing prototypes, integration, performance analysis and customer demonstration
* Author whitepapers covering new classification algorithms and briefing system design and performance results to customer
* Develop and integrate multi-threaded object-oriented Java code using Eclipse and manage under Subversion to maintain a fully functional product
* Implemented MATLAB prototypes and offline test scripts to train and evaluate classification performance

**Research & Development Lead**

* Led development of algorithms to recognize patterns in multi-phenomenological data and provide a means of fusing data across multiple sensors
* Identified several techniques leveraging statistics, probability and information theory, Bayesian Networks and rule-based expert systems that improved classification capabilities
* Developed innovative machine learning techniques to quantify level of estimation uncertainty
* Implemented Java based test harness to rapidly evaluate each classification algorithm over a broad range of test conditions
* Integrated algorithms into simulation and demonstrated capability for fusing information from multiple classifiers across multiple sensors

**Algorithm Team Lead**

* Led algorithm development team performing analysis of heterogeneous multi-sensor discrimination architectures and algorithms
* Investigated impact of fusing data in both distributed and centralized sensor networks and developed techniques for graceful degradation when data from networked agents are unavailable
* Defined requirements and chaired change control board for Java-based multi-sensor simulation framework
* Prepared and conducted multiple demonstrations of software to customer and technical community to demonstrate classification accuracy improvement of fusing data across multiple sensors

**Algorithm Developer**

* Developed a common process to streamline supervised learning of classification databases
* Investigated techniques for feature selection (n-dimensional distances and mutual information based)
* Investigated supervised learning approaches for developing Gaussian Mixture Models (Expectation-Maximization and Support Vector Machines)
* Implemented performance analysis metrics and evaluation system using a computing cluster to rapidly measure classification performance across a broad range of test cases
* Wrote MATLAB code to extract feature data and execute all stages of database learning and performance characterization
* Authored a technical whitepaper describing the database generation process and prototype results
* Implemented heuristic based optimization algorithm for prioritizing dynamic sets of tasks

**University of Oklahoma**

**Electric Vehicle Research Institute**

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| **Graduate Research Assistant** | **2001 – 2003** |

* Conducted flight tests of new GPS-based airplane navigation system
* Developed LabView and Simulink based simulation software to drive pilot instrumentation with new navigation system

**City of Midwest City, OK**

**Management Information Systems**

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| **Webmaster** | **1999 – 2003** |

* Worked with city departments to design municipal website from scratch
* Integrated, tested, deployed, and maintained website on local servers
* Used SQL and MS Access Databases to manage website calendars and dynamic image slideshows

**Digital Preferences**

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| **Web Developer** | **1999 – 2000** |

* Programmed back-end logic for various web-based businesses
* Used combination of HTML, SQL, ASP / VBScript and Javascript to achieve needed functionality
* Developed catalogs, calendars, shopping-carts, web page information aggregators, portals, and simplified page editing software

**REFERENCES** Available upon Request