Dominic Critchlow

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Education

Old Dominion University, Norfolk, VA, In Progress

Master of Science in Computational Applied Mathematics

Austin Peay State University, Clarksville, TN, Graduation: May 2017

Bachelor of Science in Physics, Bachelor of Science in Computer Science

Skills

Programming: **Python, C/C++, C#, Fortran, Bash, MATLAB, SQL, HTML, Apache Spark, LATEX, Hadoop, AWS, ArcGIS**

Systems: Mac, Linux, Windows

Languages: English, German

Security Clearance: Secret

Work Experience

Data Scientist, Department of Defense (DoD), The Pentagon **June 2019 – Present**

- Data Scientist, directly supporting the DoD's Chief Data Officer, DoD'S Chief Financial Officer Enterprise Analytics Team (ADVANA) to implement machine learning (ML) within the DoD.
- Developed and presented prototype applications up to the level of the Deputy Secretary of Defense.
- Leading the Warfighting & Warfighting Support Agency Portfolio Program Objective Memorandum (POM) review for the Chief Management Officer
- GAMECHANGER Project Data Scientist
    - Developing a web based application for policy analysis, utilizing Natural Language Processing to extract crucial business insights from DoD level policy.
    - Leading the development from data engineering, through user interface design.

Data Scientist, Senior Consultant, Norfolk VA **Oct 2017- June 2019**

- Multivariate Analysis of Stealth Quantities (MASQ)
    - Python programming for Multivariate Analysis of Stealth Quantities (MASQ), which is an implementation of an Unsupervised Machine Learning Algorithm. The algorithm we implemented use clustering and regression models, to find statistical outliers.
    - One of my focus areas was the conversion from text fields to accurate numerical representation, which was accomplished through Natural Language processing and standard statistical methods.
    - MASQ detects anomalies in large datasets, and for example can be used for fraud detection without prior knowledge of specific traits of the data.
    - Conducting conversion from current code base to Apache Spark for improvements in speed and large data processing. Apache Spark is a cluster computing framework that optimizes distributed computations and is capable of scaling to terabyte size datasets.
- Spectrum Efficient National Surveillance Radar (SENSR)
    - Data Science Development for the SENSR Coverage Volume (CV) Integration, Analysis, and Assessment Tool (CVIAAT), which assists FAA, DoD, DHS, and NOAA in integrating, analyzing, and assessing CVs across the Homeland Defense, Homeland Security, Air and Weather missions to articulate requirements.
    - We developed a programmatic and analytical approach of mapping and analyzing geographical requirements through python and ArcGIS. We have developed geographical outlier detection algorithms to correct input errors, as well as developing a custom convex hull algorithm to adjust geometries.
- Clouds and the Earth's Radiant Energy System (CERES)
    - Developing a cluster algorithm to classify Fortran Code to analyze the quality of code sections, and suggest improvements to minimize code maintainability, readability, and performance.
    - We developed and interactive viewer that allows the user to analyze code blocks in a cluster environment.
- Cost to Run a MEF (C2RAM)

- Maintaining and Sustaining the C2RAM tool suit that informs the Marine Corps about the Readiness of the Marine Corps
- We develop and maintain new features that allow the Marine Corps to make informed and efficient decisions about training and funds for training.

National Aeronautics and Space Administration (NASA), Wallops Flight Facility **Fall 2017**

- Data Analytics on Balloon material studies, for longer duration flights.
- Experimental research on Linear Low-Density Polyethylene (LLDP)

High Altitude Balloon Software/Hardware Developer, Austin Peay State University
2013-2017

- Designing a light weight flight computer that tracks all physical changes of the payload throughout the flight.
- Project leader for the 2017 HAB Solar Eclipse project funded by NASA.

Data Analyst on Social Network Researcher, University of Notre Dame **Summer 2016**

- Complex Networks Lab studying network alignment strategies.
- Developed new algorithms and strategies for temporal aligning of networks. *See publication section

Atomic-Scale Theoretical Physics Analyst, Vanderbilt University **Summer 2015**

- Researching atomic scale interactions between crystalline structures in the Pentalides group with collaboration of the Hagland group. *See Publication

Publications

Vipin Vijayan, Dominic Critchlow, and Tijana Milenkovic (2017), Alignment of dynamic networks, Bioinformatics, in press. Also, arXiv:1701.08842 [cs.SI]

Marvinney, Claire; ... Critchlow, Dominic; ... Pantelides, Sokrates; Haglund, Richard; (2018) Effect of Material Structure on Photoluminescence of ZnO MgO Core-Shell Nanowires. Wiley

Awards

- Robert F. Sears Award for Excellence in Physics
- SGA Senator of the Year 2016
- SGA Gregory R. Singleton Legacy Award
- Vanderbilt REU Best Physics Presentation
- Cracker Barrel Hackathon Winner

Extracurricular Activities

- Student Government Senator, Speaker of the Senate, APSU Freshmen Peer Mentor
- Governors School for Computational Physics Mentor.
- Honor Societies: Omicron Delta Kappa, Sigma Pi Sigma, Pi Mu Epsilon.
- Completed the Data Science Fundamentals class part of the Booz Allen Data Science 5K challenge.
- Indoor/Outdoor Rock Climbing