Greg Lucas

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Aerospace Engineering **PhD** and scientific **Python** programmer with over **10 years** of experience blending the boundary between scientist and engineer through novel code development and research. Applying **data fusion** and **machine learning** techniques to **satellite** and **ground based instrumentation** to identify new and unique signals that can't be identified from a single dataset alone. These techniques and results have been published in 11 peer-reviewed journal articles.

Technical Skills

Expert: Python (tensorflow, scikit-learn, pandas, dask, xarray), Linux, Fortran, version control
Intermediate: MPI, C, Java

Experience

Mendenhall Postdoctoral Fellow, United States Geological Survey 2017 - Present

- Designed a deep neural network that is able to predict magnetic field perturbations across the US from a small set of input observatories. (Poster link)
- Developed an open source software package to process and analyze data from geomagnetic and geoelectric communities. (Github link)
- Designed statistical analysis frameworks for historic magnetic field datasets to generate hazard maps highlighting areas in the US that are more susceptible to solar storms.

Graduate Research Assistant, University of Colorado 2012 - 2017

- Used machine learning techniques to analyze 4TB of data from an array of 31 instruments to identify unique signals within the data.
- Created the first physics-based model of the global electric circuit that will be included as a default module in future global climate models.

Member of the Technical Staff, Sandia National Laboratories 2009 - 2013

- Designed a new monte carlo code suite for statistical consequence analysis to determine the risk associated with launching nuclear material into space.
- Parallelized previous Fortran codes with MPI to enable 1000s of more runs to be completed and reduce the error in the analysis.
- Recognized by a review panel for innovative approaches to risk analysis.

Education

PhD Aerospace Engineering Sciences, University of Colorado 2017
Investigating the physical mechanisms that impact electric fields in the atmosphere

MS Medical Physics, University of Wisconsin 2010

BS Nuclear Engineering, University of Wisconsin 2010

Minor Computer Science, University of Wisconsin 2009