Daniel Livingston
Scientific Programmer
Computational Geometry/Meshing, GIS, Machine Learning

Contact Information

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Work Experience

Mar 2017 - Current | Research Technologist at Los Alamos National Laboratory
Los Alamos, NM

Software engineering focused on complex mesh generation for finite element geophysics/multi-physics codes. Lead developer on an open-source library for generating dynamically refined multi-material Delaunay meshes from GIS data (Python/C++). Developer on a novel NNMF-based machine learning classifier for bio-remediation applications (Julia). Lead developer on a PETSc-based multiprocessor mesh transformation / visualization program (Fortran90).

May 2016 - Jan 2017 | Research Analyst at Global Patent Solutions
Scottsdale, AZ

Perform patentability, freedom-to-operate, invalidity and state-of-the-art searches on technologies involving high-level nanotechnology, semiconductor, or electromagnetic elements. Improved ability to remove jargon from scientific technologies and to view only the crux of the technology and methods.

Jun 2015 - Dec 2015 | Machine Learning Research Assistant at SpaceTREx (ASU)
Tempe, AZ

Responsible for codebase re-factoring, parallelization (OpenMP), and algorithm optimization for an artificial neural network designed for autonomous formation and flight paths of drone clusters (language: C).

Education

May 2022 (Expected) | Master of Science in Computer Science
Georgia Institute of Technology, Atlanta, GA
Specialization: "Machine Learning"

December 2015 | Professional Science Masters in Nanoscience
Arizona State University, Tempe, AZ
Topic: "Particle-Based Device Simulations of Germanium Transistors"
Advisor: Prof. Dragica Vasileska

May 2014 | Bachelor of Science in Physics
New Mexico State University, Las Cruces, NM
Minor in Philosophy

Honors & Awards

2020   Spot Award (Los Alamos National Laboratory)
2019   Dept. of Energy Secretary's Honor Award (Source Physics Experiment).
2013   Sigma Pi Sigma - Physics Honors Society (New Mexico State Univ.)
2013   Albert & Mabel Burris Physics Fellowship (New Mexico State Univ.)
2009   Eagle Scout (Yucca Council)

Technical Skills

Programming:	Python, C++, C, Julia, Fortran, Swift, R, Bash/csh
Algorithms:	GIS & unstructured meshing algorithm development
HPC:	MPI, OpenMP, PETSc, Parallel HDF5
GIS:	GDAL, GRASS, & QGIS
Visualization:	VTK, ParaView, Matplotlib, Gadfly.jl, POV-Ray
Misc.:	Static website generation, GUI dev. (wxWidgets, UIKit), LaTeX

Public Service

May 2019   Booth Operator, The Los Alamos Arts Council Kite Festival (Los Alamos, NM)
May 2017   Aid Station, Jemez Mountain Trail Runs (Los Alamos, NM)
Fall 2016   PSM Mentor, Arizona State University (Tempe, AZ)
Aug - Dec 2016   Caregiver, Hospice Sanctuary (Scottsdale, AZ)
Mar 2015   Public Outreach, Center for Nanotechnology & Society at ASU (Tempe, AZ)

Publications & Conference Proceedings

2019

1. Mudunuru, M., Vesselinov, V., Ahmmed, B., Pepin, J. Burns, E., Livingston, D., Karra, S., Middleton, R., Tartakovsky, D., Horne, R., Machine learning for geothermal resource analysis and exploration, Computational Methods in Water Resources, pre-print.

2. Lee, M.L., Chen, X., Shuai, P., Livingston, D., High-resolution Modeling of Hydrologic Exchange Flows in the Columbia River Subbasin at the Hanford Reach, Abstract #614254 presented at 2019 AGU Fall Meeting, San Francisco, CA, 9-13 Dec.

2018

3. Livingston, D.R., Gable, C.W., Karra, S., Hannon, M.J., Pawar, R., VORONOI: An Orthogonally-Constrained and Numerically Accurate Processor for Subsurface Codes, Proceedings of the TOUGH Symposium 2018, 2018

4. Hannon, M.J., Gable, C.W., Finsterle, S., Sentis, M., Livingston, D.R., Permeability Estimates of Fractured Cylindrical Samples by the Analysis of Pressure Transients, Proceedings of the TOUGH Symposium 2018, 2018

2015

5. Kargol, A., Malinsi, L., Eskandari, R., Carter, M., Livingston., D.R., Cellular defibrillation: interaction of micro-scale electric fields with voltage-gated ion, J Biol Phys., 2015, DOI: https://doi.org/10.1007/s10867-015-9388-x