



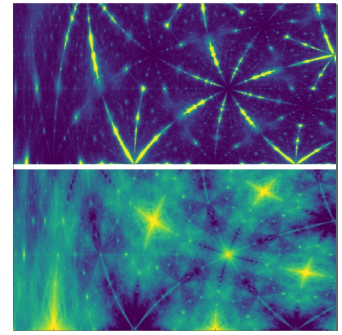
David Morison

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I am a physicist with over 10 years of experience in scientific computing and data science, and recently defended my Ph.D. dissertation *Spectral Analysis of Transport in Periodic, Quasiperiodic and Random Systems*. My software is used by the Office of Naval Research, and cited in multiple publications.

EDUCATION

Ph.D. Physics, University of Utah, Salt Lake City, USA, Aug 2021

B.A. Physics, Applied Math, University of California, Berkeley, USA, 2002

SKILLS

Python, Matlab, Octave, Fortran, Inkscape, Latex

Neural Net, Kalman Filter, Kriging/Optimal Interpolation, Spectral Clustering

Recursive Bayesian Filters, Signal Processing, Inverse Problems

Linux/Unix, Vim, Shell Scripts & Makefiles, Command Line Tools

Bulk Transport in Composites, Wave Propagation, Fluid Dynamics, Sonar, Radar

Machine Learning, Emulation, Spectral Methods, Graph Theory

OCCASIONAL USE

C++, HTML5, PHP, Sub-wavelength or Near-Field Effects, Git

EXPERIENCE

Teaching and Research Assistant, University of Utah (2015 – present)

- Designed a class of composites that exhibit an “order-to-disorder transition” (publication 6).
- Derived a correspondence between percolation and algebraic connectivity (publication 7).
- Coded a neural-net with experimental architecture, testing theoretic results (publication 7).
- Wrote a computer vision classifier as a proof of concept for a new clustering algorithm.
- Grew MgSO_4 ice to explore the potential for microbial habitability in the icy crust of Europa.
- Developed a new model of wave attenuation in the marginal ice zone.

Physicist IV, Applied Physics Laboratory, University of Washington (2006 – 2015)

- Created an invertible model of blood flow through the brain and it's measurement with ultrasound.
- Designed and wrote a radiative transfer model (publication 3).
- Developed a method of buoy drift prediction; successfully tested in the Sea of Japan.
- Validated a radar model utilized by the U.S. Navy for engineering and design purposes.
- Translated and validated an analytic model of acoustic underwater bottom reflection.
- Designed a method of assimilating bistatic sonar data to track underwater objects.
- Demonstrated a method for assimilating weather observations into ensemble forecasts.
This method is computationally cheaper than established methods e.g. ensemble Kalman filter.
- Demonstrated the prediction of over the horizon radar ducting, using satellite data.
- Studied potential acoustic propagation from hydrothermal vents.

Scientific Staff, RV Nathaniel B. Palmer (2005)

- Developed a simulation of the motion of tethered and driven oceanographic instruments.
I deployed this simulation aboard R.V. Nathaniel B. Palmer during the 2005 MaudNESS cruise.

Maintenance Manager, Cloyne Court Hotel and Casino (2001)

- I repaired a historic building, managed a budget and petitioned residents for improvements.

Expedition Experience

CCGS Des Groseilliers, deploying oceanographic instruments (SHEBA 1998)

NoCGV in Van Mijenfjorden in Svalbard, collecting data with a tethered ROV (2004)

RV Nathaniel B. Palmer interfaced with ships data (MaudNESS 2005)

Publications

- 1) Caren Marzban, Paul R. Illian, David Morison and Pierre D. Mourad, A Double-Gaussian, Percentile-Based Method for Estimating Maximum Blood Flow Velocity, *Journal of Ultrasound in Medicine*, 32(11) pp. 1913-20, 2013

- 2) Caren Marzban, Paul R. Illian, David Morison, Anne Moore, Michel Kliot, Marek Czosnyka and Pierre D. Mourad, A Method for Estimating Zero-Flow Pressure and Intracranial Pressure, *Journal of Neurosurgical Anesthesiology*, 25(1) pp. 25-32, 2013

- 3) Maria Zatko, Joseph Erbland, Joel Savarino, Lei Genga, Lauren Easley, Andrew Schauer, Timothy Bates, Patricia K. Quinn, Bonnie Light, David Morison, Hans D. Osthoff, Seth Lyman, William Neff, Bin Yuan and Becky Alexander, The Magnitude of the Snow-Sourced Reactive Nitrogen Flux to the Boundary Layer in the Uintah Basin, Utah, USA, *Journal of Atmospheric Chemistry and Physics*, 6 pp. 13837-13851, 2016

- 4) Sarah Dewey, James Morison, Ronald Kwok, Suzanne Dickinson, David Morison and Roger Andersen, Arctic Ice-Ocean Coupling and Gyre Equilibration Observed With Remote Sensing, *Geophysical Research Letters*, 45(3) pp. 1499-1508, 2018

- 5) James Morison, Ron Kwok, Suzanne Dickinson, Roger Andersen, Cecilia Peralta- Ferriz, David Morison, Ignatius Rigor, Sarah Dewey and John Guthrie, The Cyclonic Mode of Arctic Ocean Circulation, *Journal of Physical Oceanography*, (in press 2021)

- 6) David Morison, N. Benjamin Murphy, Elena Cherkaev and Kenneth M. Golden, Order to Disorder in Quasiperiodic Composites (submitted)

- 7) David Morison, N. Benjamin Murphy, Elena Cherkaev and Kenneth M. Golden, Two Perspectives on Percolation Transitions (in preparation)