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Education

Ph.D., Physics, Rutgers University *expected* August 2020
M.S., Physics, New York University 2011
A.B. *magna cum laude*, Chemistry & Physics, Harvard University 2004

Computer Skills & Programming Languages

C++: STL, Boost, GNU Scientific Library, GNU Autotools/Make/compiler
Python: NumPy, SciPy, matplotlib, NetworkX, virtual environments
HPC: MPI, cluster environments, Slurm scheduler, Google Cloud Platform
Other: Linux, PHP/LAMP/javascript/web-dev, Java/Android-dev, Mathematica, LaTeX, GNU Emacs

Research & Computational Projects

- Monte Carlo sequence network population genetics simulation code 2014 – 2020
Parallel C++ code with Python scripts for compiling/cluster-interaction/analysis; ~ 5000 lines, organized as central `SeqNet` class, several classes within it, and several executables that use it; single master process handles file I/O and communicates via MPI with worker processes; yields “measurements” to both compare with theory values and inform theoretical approach.
- First passage population dynamics on regular sequence networks 2016 – 2019
Description of evolutionary search in terms of a first passage process, with expressions depending on the allele frequency spectrum and other “de-labeled” steady state population quantities. Excellent agreement with simulations across parameter space, including the polymorphic (strong mutation) regime where the population adopts non-trivial “shape” on the network.
- Code to compute theoretical values for sampling probabilities, frequency spectra, etc. 2015 – 2018
C++ code to evaluate non-closed-form expressions (e.g., nested infinite sums) in generalization of Ewens sampling formula to include selection; parameter-value-dependent rate of convergence; handling of over/underflow; command-line arguments with `boost::program_options`; comparison with prior work in appropriate limits and with simulations.
- 3D Euler fluid dynamics code 2008
C/C++ code for final project in Computational Physics course. Runge-Kutta methods, stability analysis, 1D shock tube tests, and visualization with gnuplot.
- System administration, personal domain tedm.us 2003 – *present*
SSH-public-private-key setup for data backup and version control of files; Django-Python-based web apps, e.g., to help with staying organized; MySQL database backend.

Professional & Teaching Experience

- Rutgers University Adjunct Instructor / TA, Dept. of Physics & Astro.
General Physics I/II, recitation (Fall 2019, 2018, 2017, 2016; Spring 2019, 2018, 2017; Summer 2018, 2017, 2015, 2014);
Honors Physics II and Analytical Physics IIB, recitations (Spring 2014); General Physics II, laboratory (Summer 2013).

- New York University Technical Staff, High Performance Computing Group
Deployed web portal to display cluster metrics and resource utilization (supervisor: Erik Froese; 2010 – 2011).

- New York University Adjunct Instructor / TA, Department of Physics
Physics I/II, recitation/laboratory (Spring 2011, Spring 2010, Fall 2009); Eng. Physics III, recitation and laboratory (Spring 2011);
Natural Science I, recitation (Spring 2009); 20th Century Concepts In Space, Time & Matter, recitation (Fall 2008).

- George Washington University / American University Adjunct Instructor, Departments of Chemistry
University Physics I (GW, Spring 2008); Organic Chemistry II, laboratory (GW, Spring 2008); Organic Chemistry I, laboratory
(GW, AU Fall 2007); The Molecular World (AU, Spring 2008, Fall 2007).

- St. Stephen's School / St. Albans School (DC area) Science Teacher, Coach
Taught physics and chemistry. Assistant Coach on rowing, JV basketball, and JV football teams (2005 – 2008).

- Harvard University Teaching Fellow, Department of Chemistry
Inorganic Chemistry (Fall 2004). New course for incoming freshmen. Point groups, coordination chemistry, organometallics.

Publications & Original Work

- Pavel Khromov, Constantin D. Malliaris, Alexandre V. Morozov 2018
“Generalization of the Ewens sampling formula to arbitrary fitness landscapes”
PLOS ONE, **13**, 1–23, doi.org/10.1371/journal.pone.0190186

- Constantin D. Malliaris 2010
“Molecular dynamics simulation and experimental unfolding of fluorinated ubiquitin”
Master's thesis under Jasna Brujić, Alexander Grosberg, & Eric Vanden-Eijnden

- Hoebel, S. J., Balss, K. M., Jones, B. J., Malliaris, C. D., . . . , Ross, D. 2006
“Scanning Temperature Gradient Focusing”
Analytical Chemistry, **78**, 7186–7190, doi.org/10.1021/ac060934r

- Ross, D., Malliaris, C. D. 2004
“Whole Column Resistance Detection for Focusing Methods of Separation”
IP.com Prior Art Database disclosure, priorart.ip.com/IPCOM/000028351

Honors & Awards

- Rutgers Excellence Fellowship, Rutgers University 2011 – 2012
- Henry M. MacCracken Program Graduate Fellowship, New York University 2008 – 2010
- Summer Undergraduate Research Fellowship, NIST Summer 2003
- National Merit Scholarship, National Merit Scholarship Corporation 1999

References

available upon request