David Buch

Contact Information

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Research Interests

Semi-Supervised Learning, Scalable Posterior Approximation

Education

West Virginia University, Morgantown, WV — **In-Progress**
M.S., Applied Mathematics - [Not Yet Available] GPA

West Virginia University, Morgantown, WV — **2018**
B.S., Mathematics and Physics, *Summa cum Laude* - 3.84 GPA (*Honors College*)
Area of Emphasis: Biophysics
Minor: Statistics

Honors and Awards

West Virginia University:

- WVU Outstanding Senior, 2018
- WVU Eberly Scholar, 2018
- Whitehill Memorial Award, 2015 (*General Chemistry*)

2014 U.S. Presidential Scholar, 2014 National Merit Scholar

Publications

Improving performance of SEOBNRv3 by $\sim 300x$ — **2018**
T.D. Knowles, C. Devine, **D.A. Buch**, S.A. Bilgili, T.R. Adams, Z.B. Etienne, S.T. McWilliams. Classical and Quantum Gravity. 35: 15

Collective repacking reveals that the structures of protein cores are uniquely specified by steric repulsive interactions — **2017**
J.C. Gaines, A. Virrueta, **D.A. Buch**, S.J. Fleishman, C.S. O'Hern, and L. Regan. Protein Eng. Des. Sel. 30: 387

Presentations

SEOBNRv3_opt - A Case Study in Code Optimization for the Benefit of LIGO Science — **2018**
Oral presentation at the 28th Annual Midwest Relativity Meeting (University of Wisconsin - Milwaukee)

Optimized Numerical Approximation of Einstein's Equations through Coordinate System Management — **2018**
Poster presentation at WVU Mathematics Department Capstone Day

Experimental Validation of van der Pol Oscillator Theory in a Unijunction Transisitor Circuit Model System — **2018**
Poster presentation at WVU Physics Department Spring 2018 Undergraduate Research Day

Graphite-Lattice measurement through Matter-Wave Diffraction **2017**
Poster presentation at WVU Physics Department Fall 2017 Undergraduate Research Day

Evaluating a Simplified Approach to Protein Modeling Using Rotamer Recovery Tests and the Rosetta Software Suite **2015**
Poster presentation and oral presentation at Raymond and Beverly Sackler Institute NSF-REU (Yale University)

Teaching Experience

Graduate Teaching Assistant (Mathematics) Fall 2018-
West Virginia University, Morgantown, WV
- Lab TA, grader for Calc 153, Fall 2018

GRE Tutor Fall 2017-
NextStep Test Preparation
- "Premium" Tutor beginning Spring 2019

WVU Athletic Tutor Fall 2016
West Virginia University Athletic Department, Morgantown, WV

Violin/Cello Instructor Fall 2013-Spring 2014
School of Harmony, Beaver, WV

Academic Activities

LIGO Scientific Collaboration **Summer 2016**

Raymond and Beverly Sackler NSF-REU in Biophysics **Summer 2015**

Community Service & Leadership

WVU Community Competitive Math Training
WVU Math Club Vice-President, Treasurer
WV Chapter of the Sierra Club, Executive Committee
WVU Sierra Student Coalition, Vice President
WV Science Public Outreach Team Ambassador

Skills

Computing: C, C++, R, Python, Git, LaTeX
Operating Systems: Unix, Ubuntu Linux
Languages: English (fluent), Spanish (low-conversational), Chinese, Arabic, French, German, Greek (familiar)
Music: WVU Symphony Orchestra, WVU Undergraduate String Quartet, WV Symphony Vaughan Fellowship 2013, WV All-State Orchestra 2012-2014

Other Work Experience

Daily Athenaeum - Copy Writer Spring 2016
West Virginia University, Morgantown, WV
Line Server Fall 2013-Spring 2014
Qdoba Mexican Grille, Beckley, WV