Jason Turner

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EDUCATION

UNIVERSITY OF WISCONSIN - MADISON | Ph.D. in Mathematics
Expected May 2023 | Madison, WI

UNION COLLEGE | B.Sc. in Mathematics and Physics
June 2018 | Schenectady, NY

PUBLICATIONS

`Turner, J. L., and Stechmann, S. N.`, Parallelizing a serial code: open–source module, EZ Parallel 1.0, and geophysics examples, Geoscientific Model Development Discussions, 2020 (2020), pp. 1–18. (Under Review.)

`Turner, J. L., and LaBrake, S.`, Elementary computational fluid dynamics using finite-difference mehtods, Union Digital Works Honors Theses, 1581 (2018), pp. 1–27.

`Turner, J. L., Johnson, B., and Gasparovic, E.`, Introduction to computational topology using simplicial persistent homology, Union Digital Works Honors Theses, 1660 (2018), pp. 1–129.

RESEARCH PROJECTS

IMPLEMENTATION OF A MULTI-MODEL ENSEMBLE FOR CLIMATE FORECASTING | University of Wisconsin - Madison Department of Mathematics
November 2019 - Present | Madison, WI
Implementing a multi-model ensemble for climate forecasting in Fortran on the University of Wisconsin - Madison high-performance computing cluster. Advised by Professor Stechmann.

EZ PARALLEL: AN MPI FORTRAN LIBRARY FOR EASING FINITE DIFFERENCE / PSUEDO-SPECTRAL CODE PARALLELIZATION | University of Wisconsin - Madison Department of Mathematics
September 2018 - March 2020 | Madison, WI
Developed a library in Fortran with the goal of upgrading a serial geophysical fluid dynamics code to a parallel one, with the ability to parallelize several different numerical methods such as finite difference and discrete Fourier transforms. Advised by Professor Stechmann.

`EZDFFTPACK`: A COLLECTION OF WRAPPERS FOR `DFFTPACK` | University of Wisconsin - Madison Department of Mathematics
August 2019 | Madison, WI
Developed a collection of wrappers for the Fortran double-precision fast-Fourier transform library `DFFTPACK`. Advised by Professor Stechmann.

STATISTICAL ANALYSIS OF RICHTMYER-MESHKOV INSTABILITIES | Los Alamos National Labs
June 2018 - August 2018 | Los Alamos, NM
Conducted a statistical analysis on the interfacial properties of fluids undergoing Richtmyer-Meshkov instability based on the initial interface perturbation, and created visualizations in Python. Advised by Jesse Canfield and Juan Saenz.

SIMULATION OF ELEMENTARY FLUID FLOWS | Union College Department of Physics
January 2018 - June 2018 | Schenectady, NY
Utilized finite difference methods to simulate various elementary two-dimensional fluid flows in Python, including viscous flows with obstructions and small waves. Advised by Professor Scott LaBrake.

PERSISTENT HOMOLOGICAL ANALYSIS OF BUCKYBALL® ARRANGEMENTS | Union College Department of Mathematics
September 2017 - March 2018 | Schenectady, NY
Analyzed arrangements of BuckyBalls® using persistent simplicial homology computed with Javaplex in MATLAB, and related results to the formation of crystalline structures. Advised by Professors Brenda Johnson and Ellen Gasparovic.

GENERALIZATIONS OF COLLATZ FUNCTIONS | CSU Channel Islands REU 2017
June 2017 - August 2017 | Camarillo, CA & Schenectady, NY
Investigated generalizations of Collatz functions to rings of quadratic integers and geometric algebras. Developed and updated code in Wolfram Mathematica to handle computations in the Eisenstein integers and geometric algebras. Advised by Professor Alejandra Alvarado.

ACHIEVEMENTS AND FELLOWSHIPS

FELLOWSHIPS AND GRANTS

NERSC AY 2020 Exploratory Allocation Award 2020
Department of Energy Computational Science Graduate Fellowship 2019

AWARDS

University Housing's Honored Instructor Award 2019
George H. Catlin (1867) Prize 2018
Martin Terry Resch Prize 2018
Professor Frank Titus Memorial Prize in Physics 2018

SOCIETIES

Omicron Delta Kappa Honor Society 2017
Phi Beta Kappa Honor Society 2017
Pi Mu Epsilon Honor Society 2017
Sigma Pi Sigma Honor Society 2017

AFFILIATIONS

Department of Energy Computational Science Graduate Fellowship
University of Wisconsin-Madison Department of Mathematics
American Mathematical Society

TALKS, WORKSHOPS, AND POSTER PRESENTATIONS

Statistical Analysis of Richtmyer-Meshkov Instabilities ..... Los Alamos 2018 Computational Physics Summer Workshop
Persistent Homology of BuckyBall® Configurations ..... 2018 Union College Steinmetz Day
The Dynamics of Everyday Fluid Flows ..... 2018 Union College Steinmetz Day
Integrating Fluid Dynamics into the Undergraduate Curriculum ..... 2018 APS March Meeting
Generalizations of Collatz Functions ..... Union College Undergraduate Math Seminar Series
Introduction to LaTeX: General Use and Resume Writing ..... Winter 2018, Union College
Generalizations of Collatz Functions to Geometric Algebras ..... 2017 APS New York State Sectional Autumn Meeting