Damyn **Chipman**

PhD Candidate · Scientific Software Developer

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Education

Boise State University
Expected: December 2023

Doctor of Philosophy in Computing — *Boise, ID*

- Emphasis: Computational Sciences and Engineering
- Current Research: Fast and Scalable Direct Elliptic Solvers on Adaptive Meshes

Brigham Young University
April 2019

Bachelor of Science in Applied Physics — *Provo, UT*

- Emphasis: Computational Physics and Engineering
- Senior Thesis: Aerodynamics Modeling Using a Mesh-Free Approach

Work and Research Experience

Lawrence Livermore National Laboratory
May 2022 - August 2022

Defense Science and Technology Intern — *Livermore, CA*

- Developed scientific software for lab-wide physics applications.
- Implemented a new material interface reconstruction method into the multi-physics code KULL.
- Presented results during end of summer SLAM presentations to lab directorate.

Boise State University Geophysics Department
January 2022 - May 2022

Adjunct Faculty — *Boise, ID*

- Taught GEOS357/597: Computation in the Geosciences.
- Prepared course content, delivered class lectures, assisted students with assignments.
- Taught both online and in-person sections with associated technologies.

Lawrence Livermore National Laboratory
May 2021 - August 2021

High Energy Density Physics Intern — *Livermore, CA*

- Aligned LLNL's nuclear data codes FUDGE and GIDI+ for improved productivity and accuracy.
- Contributed several new features and hundreds of verified and tested lines of code.
- Presented results during end of summer SLAM presentations to lab directorate.

Mission Support and Test Services
June 2019 - August 2020

Associate in Science — *Las Vegas, NV and Livermore, CA*

- Supported multiple projects with a computational emphasis to develop tools for mission critical diagnostic equipment.
- Implemented an axis correction algorithm using machine learning techniques.
- Developed an image processing software package for neutron image data analysis.

Boise State University Mathematics Department
August 2019 - December 2019

Graduate Assistant — *Boise, ID*

- Teaching assistant for MATH365: Intro to Computational Mathematics.
- Assisted professor in teaching, guiding students, and grading.
- Held regular office hours to assist students in person.

Flight, Optimization and Wind Lab
April 2018 - May 2019

Research Assistant — *Provo, UT*

- Assisted in research for computational fluid dynamics software.
- Designed and developed a vortex sheet boundary package `VSB.jl` for vortex particle method integration.
- Modeled propeller-wing interaction using the novel vortex particle method.

Advanced Power Cycles Lab
June 2016 - April 2018

Research Assistant — *Provo, UT*

- Assisted in research for nuclear power cycles.
- Developed a 1, 2, and 3-stage optimized Rankine power cycle model for nuclear power application.
- Assisted in formulation, testing, and verification of water-ammonia thermodynamic property package code.

Brigham Young University Physics Department
August 2016 - April 2018

Teaching Assistant — *Provo, UT*

- Assisted professors in teaching and grading for introductory to advanced physics classes, including computational physics lab sequence.
- Implemented new teaching program for 150+ students.
- Oversaw sections of 20-30 students as Recitation Section Leader.

Publications

2022 **D. Chipman**. *Overview of Solution Methods for Elliptic Partial Differential Equations on Cartesian and Hierarchical Grids.* `arXiv:2205.03356 [cs.CE]`.

2019 **D. Chipman**. *Viscous Aerodynamics Modeling Using a Mesh-Free Approach*. Brigham Young University. Senior Thesis.

2018 **D. Chipman**. *Energy... It's Everywhere! Forms of Energy - Sound, Light, Heat, and Electricity*. STEMTaught Journal for elementary schools.

Conferences and Presentations

2022 **D. Chipman**. *A Fast and Adaptive Elliptic Partial Differential Equation Solver on Quadtree Meshes*. Wasatch SIAM Conference 2022. Salt Lake City, UT.

2022 **D. Chipman**, B. Stephens. *A New Material Interface Reconstruction (MIR) Implementation in KULL*. LLNL SLAM Presentation. Livermore, CA.

2022 **D. Chipman**. *Higher Order Tsunami Simulations and Novel Solution Methods.* Boise State University Graduate Student Showcase Poster. Boise, ID.

2021 **D. Chipman**, et al. *FUDGE and GIDI+: Aligning LLNL's Nuclear Data Codes and API.* LLNL SLAM Presentation. Livermore, CA.

2021 **D. Chipman**, D. Calhoun. *Progress Towards a Fast, Scalable, and Direct Elliptic PDE Solver for Adaptive Meshes.* SIAM CSE 2021 Conference Presentation.

2020 Durand, Alice, **et al.**. *High-Fidelity Dynamic Neutron Imaging and Radiography for Subcritical Experiments and Other Applications.* No. DOE/NV/03624-0829. Nevada National Secruity Site/Mission Support and Test Services LLC. Las Vegas, NV.

2020 **D. Chipman**, et al. *Characterizing On-Axis X-Ray Spectra with Off-Avis Detectors.* Mission Directorate Presentation. Las Vegas, NV.

2019 **D. Chipman** et al. *Image Processing and Reconstruction of Neutron and X-Ray Images.* Senior Leadership Team Presentation. Las Veags, NV.

2019 **D. Chipman** et al. *Aerodynamics Modeling Using a Mesh-Free Approach.* Utah Conference for Undergraduate Research Presentation. Ogden, UT.

Honors and Awards

2020 MSTS Hot Shot Award for Exceptional Work

2019 Boise State University Graduate Assistant Fellowship

2019 Brigham Young University Graduate Assistant Fellowship

2013 Eagle Scout Award from Boy Scouts of America

2009 Palo Verde High School Cross Country Coach's Award

Volunteer Work

The Church of Jesus Christ of Latter-day Saints

January 2020 - May 2022

Youth Leader — *Boise, Idaho*

- Assisted in overseeing youth activities and teaching.
- Planned and organized events for youth.

The Church of Jesus Christ of Latter-day Saints

August 2013 - August 2015

Volunteer Missionary — *Mexico City, Mexico*

- Served as religious representative in the Mexico City Northwest Mission, providing large and small scale community service.
- Oversaw 20-30 other volunteers through training in communication, problem solving, and volunteer strategy.

Las Vegas Bureau of Land Management

February 2011 - May 2011

Eagle Scout — *Las Vegas, NV*

- Organized over 300 volunteers for large scale cleaning project at Mount Charleston in Las Vegas.
- Trained local site leaders in safety precautions and project procedures.

Clubs and Societies

SIAM Society of Industrial and Applied Mathematics (Boise State Chapter)

BSUA Boise State University Alpine Club

ANS American Nuclear Society (Brigham Young University Chapter) (past)

Skills and Goals

Software	C/C++ (7 years), Python (6 years), MATLAB (6 years), Mathematica (6 years)
Technologies	Git, MPI, CUDA, sklearn, PETSc, ParaView, VisIt, Microsoft Office Suite, Blackboard, Canvas, LearningSuite
Experience	Object Oriented Programming, Design Patterns, Machine Learning, Finite Element Methods, Image Processing, Optimization
Languages	English, Spanish

Effective	Be an effective and hard working example of the establishment that I represent
Efficient	Efficiently solve any problem presented to me through effective problem solving skills
Optimistic	Always maintain an optimistic attitude when working; individually and in teams
Dedicated	Challenge myself by developing additional talents and seeking more knowledge