Ben **Whitney**

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Education

Brown University — *Providence, RI*

Doctor of Philosophy — *2013-09 — 2018-04*

- advised by Mark Ainsworth
- thesis entitled 'Multilevel Techniques for Compression and Reduction of Scientific Data' defended 2018-04-19
- received Sigma Xi Award for excellence in research and high potential for future contributions

Brown University — *Providence, RI*

Master of Science — *2013-09 — 2014-05*

- qualifying exams in probability, real analysis, numerical analysis, and higher-order methods

Harvard College — *Cambridge, MA*

Bachelor of Arts — *2009-09 — 2013-05*

- concentrated in mathematics with a citation in French
- received Martin McPeck prize for academic achievement and graduated cum laude

Skills

Programming C++, Python, Cython, UNIX shell, MPI, OpenMP
Languages English, French

Experience

Brown University — *Providence, RI*

Postdoctoral Research Associate — *2018-06 — Present*

Conducted research on hierarchical data compression methods (both theory and implementation), authored papers, and presented results at conferences.

Community College of Rhode Island — *Cranston, RI*

Instructor — *2018-09 — 2018-12*

Lectured, wrote quizzes, and graded for Math 0099 (remedial arithmetic) for inmates at John J. Moran Medium Security Facility.

Argonne Training Program on Extreme-Scale Computing — *St. Charles, IL*

Participant — *2017-07 — 2017-08*

Studied numerical algorithms, hardware architectures, parallel programming methodologies, issues of portability in HPC codes, etc.

Brown–Kobe Simulation Summer School

Providence, RI/Kobe, Japan

Team Leader

2016-08 — 2016-09

- Designed and led a research project focusing on compression methods.
- Wrote and taught MPI tutorial to prepare students for work on Brown University OSCAR cluster and Kobe University PRIMEHPC FX10 computer.
- Covered basic information theory, arithmetic coding, predictive coding, progressive image compression methods, and parallel implementation considerations.

Brown University

Providence, RI

Teaching Assistant

2014-09 — 2015-12

- TA for APMA 1650 (first course in mathematical statistics) fall 2014
- TA for APMA 0330 (first course in ordinary differential equations) spring 2015
- Head TA for APMA 0330 fall 2015

Community College of Rhode Island

Cranston, RI

Instructor

2014-06 — 2014-08

Lectured, wrote quizzes, and graded for Math 0500 (review of arithmetic) for inmates at John J. Moran Medium Security Facility.

Brown University

Providence, RI

Math Resource Center tutor

2014-02 — 2014-12

Answered homework questions from undergraduates in introductory courses.

Presentations

Graduate Student Seminar

Providence, RI, USA

Multilevel Techniques for Compression and Reduction of Scientific Data

2017-10

An introduction to hierarchical methods and the adaptive and nonadaptive algorithms of `MGARD`.

14th U.S. National Congress on Computational Mechanics

Montréal, Quebec, Canada

Multilevel Techniques for Compression and Reduction of Scientific Data

2017-07

An introduction to `MGARD`, with a focus on the implementation of the nonadaptive algorithms and the effect of their application on statistics of interest to turbulence researchers.

2018 SIAM Annual Meeting

Portland, Oregon, USA

Hierarchical Splitting and Adaptive Reduction of Data (`MGARD`)

2018-07

An introduction to `MGARD`, with a focus on the implementation of the adaptive algorithms and the control of errors induced in quantities of interest.

Publications

Multilevel Techniques for Compression and Reduction of Scientific Data—The Unstructured Case

In preparation

2018-12

Joint work with Mark Ainsworth, Ozan Tugluk, and Scott Klasky.

Multilevel Techniques for Compression and Reduction of Scientific Data—The Univariate Case *10.1007/s00791-018-00303-9*

Accepted to Computing and Visualization in Science *2018-11*

Joint work with Mark Ainsworth, Ozan Tugluk, and Scott Klasky.

Coupling Exascale Multiphysics Applications: Methods and Lessons Learned

Accepted to eScience 2018 *2018-10*

Joint work with Jong Choi, Choong-Seock Chang, Julien Dominski, Scott Klasky, Gabriele Merlo, Eric Suchyta, Mark Ainsworth, Bryce Allen, Franck Cappello, Michael Churchill, Philip Davis, Sheng Di, Greg Eisenhauer, Stephane Ethier, Ian Foster, Berk Geveci, Hanqi Guo, Kevin Huck, Frank Jenko, Mark Kim, James Kress, Seung-Hoe Ku, Qing Liu, Jeremy Logan, Allen Malony, Kshitij Mehta, Kenneth Moreland, Todd Munson, Manish Parashar, Tom Peterka, Norbert Podhorszki, Dave Pugmire, Ozan Tugluk, Ruonan Wang, Matthew Wolf, and Chad Wood.

Multilevel Techniques for Compression and Reduction of Scientific Data—Quantitative Control of Accuracy in Derived Quantities

Submitted *2018-08*

Joint work with Mark Ainsworth, Ozan Tugluk, and Scott Klasky.

Diagonal Splittings of Toric Varieties and Unimodularity *10.1090/proc/13902*

Proceedings of the American Mathematical Society *2018-05*

Joint work with Jed Chou, Milena Hering, Sam Payne, and Rebecca Tramel.

Multilevel Techniques for Compression and Reduction of Scientific Data

Brown University PhD thesis *2018-05*

Multilevel Techniques for Compression and Reduction of Scientific Data—The Multivariate Case

Submitted *2018-01*

Joint work with Mark Ainsworth, Ozan Tugluk, and Scott Klasky.

Compression Using Lossless Decimation: Analysis and Application *10.1137/16M1086248*

SIAM Journal on Scientific Computing *2017-08*

Joint work with Mark Ainsworth and Scott Klasky.

Exacution: Enhancing Scientific Data Management for Exascale *10.1109/ICDCS.2017.256*

2017 IEEE 37th International Conference on Distributed Computing Systems (ICDCS) *2017-07*

Joint work with Scott Klasky, Eric Suchyta, Mark Ainsworth, Qing Liu, Matthew Wolf, Jong Choi, Ian Foster, Mark Kim, Jeremy Logan, Kshitij Mehta, Todd Munson, George Ostrouchov, Manish Parashar, Norbert Podhorszki, David Pugmire, and Lipeng Wan.