

J. Travis Johnston

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EDUCATION

- ◇ **University of South Carolina**, Columbia, SC
Ph. D. Mathematics, May 2014.
Advisor: Linyuan Lu.
- ◇ **University of Nebraska-Lincoln**, Lincoln, NE
B.S. Mathematics, May 2009. GPA: 3.95
Concurrent Minors in Physics and French
University Honors Program, Received degree with Highest Distinction
- ◇ **North Platte High School**, North Platte, NE
Valedictorian; May 2002

POSITIONS HELD

- ◇ **Postdoctoral Researcher**, Univ. of Delaware, September 2014-Present.
Designed algorithms for extreme scale, scientific computing on big data sets with applications to numerical reproducibility, protein folding and prediction, and exoplanet detection. Used wide range of statistical machine learning techniques including surrogate modeling and clustering algorithms to perform in situ analysis of data. Collaborated with and mentored undergraduate and graduate student researchers.
- ◇ **Graduate Teaching Assistant**, Univ. of S. Carolina, Fall 2009 - Spring 2014.
Taught recitations and Maple labs, held office hours, review sessions, proctored exams and quizzes, graded quizzes and homework, created activities for Maple labs.
- ◇ **Math Summer Intern**, National Security Agency, May-Aug 2008.
Studied graphics editing techniques. Developed algorithms to detect editing techniques and effects, and implemented these algorithms into image processing software.
- ◇ **Teaching Assistant** Univ. of Nebraska-Lincoln, Fall 2007 - Spring 2009.
Taught recitations, held office hours, review sessions, proctored exams and quizzes, graded exams, quizzes and homework. (2 first semester calculus courses, 1 third semester honors calculus course).

HONORS AND AWARDS

- ◇ **2014 Breakthrough Graduate Scholar**, “The Breakthrough Graduate Scholars program honors USC graduate students who demonstrate excellence in the classroom, and make considerable contributions to research and scholarly activities in their field.”
- ◇ **Dean’s Dissertation Fellowship**, \$25,000 award from the College of Arts and Sciences. Designed to give graduating students more opportunity to travel and conduct research.
- ◇ **SIAM Service Award**, award from SIAM for “outstanding efforts and accomplishments on behalf of the SIAM chapter.”
- ◇ **3rd Place 2009 Cryptanalytic Literature Competition**, Sponsored by the Kryptos Society; paper written while a summer intern at the NSA, first time student work was ever considered in the competition.
- ◇ **Graduate Recruitment Fellowship**, University of South Carolina Graduate School fellowship, \$8000/yr for 3 years.
- ◇ **Chair’s Prize for Outstanding Undergraduate in Mathematics**, UNL Dept. of Mathematics prize awarded to one graduating math major.
- ◇ **Regent’s Scholar**, University of Nebraska-Lincoln Board of Regent’s Scholarship, full-tuition for 4 years.

PAPERS

- ◇ **On the Need Reproducible Numerical Accuracy through Intelligent Runtime Selection of Reduction Algorithms at the Extreme Scale**, Dylan Chapp, Travis Johnston, Michela Becchi, Michela Taufer. IEEE Cluster 2015 (accepted).
- ◇ **Performance Tuning of MapReduce Jobs Using Surrogate-based Modeling**, Travis Johnston, Mohammad Alsulmi, Pietro Cicotti, Michela Taufer. Procedia Computer Science (International Conference on Computational Science, ICCS), volume 51, 2015, Pages 49-59.
- ◇ **New Non-Jump values for Uniform Hypergraphs**. Travis Johnston and Linyuan Lu (In preparation).
- ◇ **Strong Jumps and Lagrangians of Non-Uniform Hypergraphs**. Travis Johnston and Linyuan Lu. (Submitted)
- ◇ **Abelian groups yield many large families for the diamond problem**. Éva Czabarka, Aaron Dutle, Travis Johnston, and László Székely. European Journal of Combinatorics (Accepted)
- ◇ **Boolean Algebras and the Lubell Function**. Travis Johnston, Linyuan Lu, and Kevin Milans. Journal of Combinatorial Theory Series A (JCTA) (Accepted).
- ◇ **Turán Problems on Non-uniform Hypergraphs**. Travis Johnston and Linyuan Lu. Elec. Journal of Combinatorics, volume 21, issue 4, (2014).
- ◇ (See Honor's and Awards) Internally published paper at National Security Agency (while working as summer intern). Won award for the paper—this was the first time a student paper was ever considered in the competition.
- ◇ **Sorting Signed Permutations Using Cut-And-Paste Operations** Thesis submitted for partial fulfillment of requirements for the University Honors Program and graduation with Highest Distinction.
- ◇ **Vibrational properties of ferroelectric β -vinylidene fluoride polymers and oligomers** Serge M. Nakhmanson, Rafal Korlacki, J. Travis Johnston, Stephen Ducharme, Zhongxin Ge. Physical Review B **81**, 174120 (2010).
- ◇ **Oligo (Vinylidene Fluoride) Langmuir Blodgett films studies by spectroscopic ellipsometry and the density functional theory** Rafal Korlacki, J. Travis Johnston, et al. Journal of Chemical Physics (2008).

TALKS AND POSTERS

- ◇ Connections in Discrete Mathematics, **New Non-jump Values for Uniform Hypergraphs**, June 2015.
- ◇ 28th Cumberland Conference on Combinatorics, Graph Theory, and Computing, **In-Situ Analysis of Protein Folding Trajectories**, May 2015.
- ◇ Univ. of Delaware Discrete Math Seminar, **Hypergraphs and the Jumping Constant Conjecture**, March 2015.
- ◇ Univ. of Delaware Math Club, **Ramsey Theory: searching large haystacks for small needles (which may not exist)**, February 2015.
- ◇ 45th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, **Jumps (and non-jumps) in Hypergraphs**, March 2014.
- ◇ Brigham Young University, **Turán Problems on Hypergraphs**, January 2014.
- ◇ Univ. of Chicago Theory of Computing Seminar, **Connecting Turán Problems on Hypergraphs to Forbidden Subposet Problems**, October 2013.
- ◇ USC Discrete Math Seminar, **Connecting Turán Problems on Hypergraphs to Forbidden Subposet Problems**, September 2013.
- ◇ 26th Cumberland Conference on Combinatorics, Graph Theory, and Computing, **Lagrangians and Jumps for Non-uniform Hypergraphs**, May 2013.
- ◇ USC Discrete Math Seminar, **Lagrangians of Non-uniform Hypergraphs**, April 2013.
- ◇ AMS Sectional Meeting, Ames IA, presented poster: **Turán Problems on Non-uniform Hypergraphs**, April 2013.

· Honors Calculus I-II (Recitations) Fall 2007

- UGRAD
RESEARCH
- ◇ **UNL Dept. of Mathematics**, Research Assistant Fall 2007 - Spring 2009
Recieved a NSF funded MCTP (Mentoring through Critical Transition Points) grant to do undergraduate research in Math. I worked on two problems in Combinatorics and Graph theory during 07-08 school year. Grant funded thesis research studying permutation sorting via cut and paste operations.
 - ◇ **UNL Dept. of Physics**, Research Assistant, Jan 2007 - July 2009
Studying the crystal structure of ferroelectric thin films, using quantum chemistry software (PCgameSS and PQS) for computational models, IR-Spectroscopy, Ellipsometry, and Pyroelectric Scanning Microscopy.
 - ◇ **UNL Dept. of Physics** Undergraduate Research, Fall 2006 - Spring 2007
2 semesters of Indepent study. Studied computational molecular dynamics, implemented algorithms to numerically approximate solutions to differential equations, and wrote simulations in C++.