Jason Vander Woude

203 Avery Hall
Lincoln, NE 68588

Email: jasonvw@huskers.unl.edu
Website: jason-v-w.github.io
GitHub: github.com/jason-v-w

EDUCATION

Joint Ph.D. in Computer Science and Mathematics — Anticipated May 2023
University of Nebraska–Lincoln, Lincoln, NE — GPA: 4.0 on 4.0 scale

Master of Science in Mathematics (M.S.) — May 2020
University of Nebraska–Lincoln, Lincoln, NE — GPA: 4.0 on 4.0 scale
- Mathematics (graduate major)
- Computer Science (graduate minor)

Bachelor of Science in Engineering (B.S.E.) — May 2018
Bachelor of Arts in Computer Science (B.A.) — May 2018
Dordt University (formerly Dordt College), Sioux Center, IA — GPA: 3.9 on 4.0 scale
- Electrical Engineering (major) — 4.0 in majors
- Computer Science (major)
- Mathematics (minor)

RESEARCH

Computational Space Complexity — August 2020 – Present
University of Nebraska–Lincoln, Lincoln, NE — V.N. Variyam
- Currently exploring the abilities of Turing machines with $o(\log n)$ space

Plant Genome Imputation — July 2017 – August 2019
Dordt University, Sioux Center, IA — N.L. Tintle, J. Poland
- Ported a plant genetics imputation algorithm from Java to R to improve usability for researchers
- Improved the algorithm to produce results in way that enables statistical analysis
- Release the improved algorithm (LaByRInth) on GitHub to promote its use in genetics research

Abstract Algebra — May 2017 – September 2017
Dordt University, Sioux Center, IA — M. Janssen
- Proved a previously conjectured relationship between abstract algebraic objects (ideals of graphs)
- Discovered an equality relation involving these objects that was stronger and more general
- Established means of calculating various metrics of interest regarding these relationships

Genetic Analysis Workshop 20 (GAW20) — November 2016 – June 2017
Dordt University, Sioux Center, IA — N.L. Tintle
- Researched and evaluated the performance of novel gene-based statistical tests of association
- Demonstrated proof of concept for a new data aggregation method using simulated data
- Served as primary programmer and technical support for two groups and lead author for one
- Worked with SLURM workload manager on a Linux computing cluster

E. Coli Gene Activity States — August 2016 – November 2016
Dordt University, Sioux Center, IA — N.L. Tintle
- Conducted exploratory research on modeling E. coli gene activity states using regulatory networks
- Created a modeling process that had potential to be more informative than the current standard
- Produced results used in an NSF-MCB grant proposal to secure funding for further research

PUBLICATIONS

J. Vander Woude, N. Ryder, S.K. Shrestha, N.L. Tintle, and J. Poland, "A new genotype imputation algorithm for inbred biallelic populations from low-coverage sequencing," *in preparation*

M. Janssen, T. Kamp, and **J. Vander Woude**, "Comparing powers of edge ideals," *J. Algebra Appl.*, p. 1950184, Oct. 2018. doi: 10.1142/S0219498819501846

J. Vander Woude, J. Huisman, L. Vander Berg, J. Veenstra, A. Bos, A. Kalsbeek, K. Koster, N. Ryder, and N.L. Tintle, "Evaluating the performance of gene-based tests of genetic association when testing for association between methylation and change in triglyceride levels at GAW20," *BMC Proc.*, vol. 12, no. 9, p. 50, Sep. 2018. doi: 10.1186/s12919-018-0124-y

J. Veenstra, A. Kalsbeek, K. Koster, N. Ryder, A. Bos, J. Huisman, L. Vander Berg, **J. Vander Woude**, and N.L. Tintle, "Epigenome wide association study of SNP-CpG interactions on changes in triglyceride levels after pharmaceutical intervention: a GAW20 analysis," *BMC Proc.*, vol. 12, no. 9, p. 58, Sep. 2018. doi: 10.1186/s12919-018-0144-7

A. Kalsbeek, J. Veenstra, J. Westra, C. Disselkoen, K. Koch, K. McKenzie, **J. Vander Woude**, J. O'Bott, K. Fischer, G.C. Shearer, W.S. Harris, and N.L. Tintle, "A genome-wide association study of red-blood cell fatty acids and ratios incorporating dietary covariates: Framingham heart study offspring cohort," *PloS one*, vol. 13, no. 4, p. e0194882, Apr. 2018. doi: 10.1371/journal.pone.0194882

SOFTWARE

LaByRInth: Low-coverage Biallelic R Imputation October 2018
Source code can be found as a pinned repository at github.com/jvwowd

PRESENTATIONS

Survey of Space Complexity and Connectivity
Qualifying Exam Presentation at U. Nebraska–Lincoln (Department of Computer Science) December 2019

Uncertainty and Imputation of Plant Genotypes
Research Presentations at University of Michigan (Biostatistics Department) July 2018

Cyclic Graphs, Their Edge Ideals, and a Comparison of Powers
Math on the Northern Plains April 2018

Associating Phenotypic Distributions with Genotypes in Wheat
Research Presentations at Iowa State University (Statistics Department) June 2017

Symbolic Powers of Ideals
Dordt University Summer Seminar June 2017

Evaluating the Performance of Gene-Based Tests of Genetic Association between Methylation and Change in Triglyceride Levels
Dordt University Ideafest April 2017
Math on the Northern Plains April 2017

TALKS

Generalized Principal Component Analysis
Machine learning topics course; based on paper of the same name by R. Vidal, *et al.* April 2019

On the Power of the Compass
Discrete math seminar; based on paper of the same name by M. Blum and D. Kozen *et al.* November 2019

TEACHING ROLES

University of Nebraska–Lincoln

Recitation Instructor	Calculus I	MATH 106	Fall 2018, Spring 2019
Instructor of Record	Contemporary Mathematics	MATH 203	Fall 2019, Spring 2020, Fall 2020
Course Development	Contemporary Mathematics	MATH 203	Summer 2020
Associate Convener	Contemporary Mathematics	MATH 203	Fall 2020

Dordt University

Tutor	Calculus, Microprocessors, College Algebra	Fall 2015, Spring 2016, Fall 2016

WORKSHOPS

Nebraska Open Access Materials Online Workshop July 2020
Workshop with professors from across Nebraska discussing effective online teaching methods

SELECTED ACTIVITIES

Putnam Competitions (80^{th} percentile in 2017)
President, IEEE Dordt University Student Branch (2017)
ACM Programming Competitions (every year as an undergraduate)
Volunteering for UNL Math Day (every year as a graduate)
Volunteering for Dordt University STEM-fest (most years as an undergraduate)
Volunteer trip to Nicaragua partnering with local schools to utilize Raspberry Pis (January 2016)

PROGRAMMING LANGUAGES

***beginner**: completed some online tutorials and wrote toy functions*
***intermediate**: used for 1-2 college courses for most assignments or have an equivalent skill level*
***proficient**: used for many projects and gained experience with the language and its nuances*

R	Proficient	**C**	Intermediate	**Haskell**	Beginner
Java	Proficient	**Sage**	Intermediate	**Javascript**	Beginner
Python	Intermediate	**MATLAB**	Intermediate		
C++	Intermediate	**Lisp (4 variants)**	Intermediate		

HONORS & AWARDS

NSF Graduate Research Fellowship Honorable Mention (National Science Foundation)

Dohrmann Fellowship (CS Department, UNL)

Walter Mientka Teaching Award (Math Department, UNL)
Outstanding First Year Student Award (Math Department, UNL)

Distinguished Scholar Award (Dordt University)
Presidential Scholarship (Dordt University)
Presidential Award for Future Leaders (Dordt University)

Interstates Companies Scholarship (Dordt University)
Electrical Computer Chemical Engineering Scholarship (Dordt University)
Engineering Design Associates Inc Engineering Scholarship (Dordt University)

Invited Student Representative, Engineering Advisory Board (Engineering Dept., Dordt University)