Jessen Havill

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Education

The College of William and Mary, Williamsburg, Virginia
Doctor of Philosophy, Computer Science (August, 1998)
Thesis: Analysis of Algorithms for Online Routing and Scheduling in Networks
Master of Science, Computer Science (May, 1994)

Bucknell University, Lewisburg, Pennsylvania
Bachelor of Arts (Magna Cum Laude), Computer Science and Religion (May, 1992)

Professional Appointments

Professor of Mathematics and Computer Science (2011 –)
Associate Professor of Mathematics and Computer Science (2004 – 2011)
Assistant Professor of Mathematics and Computer Science (1998 – 2004)
Department of Mathematics and Computer Science, Denison University, Granville, Ohio

Instructor / Teaching Assistant (1992 – 1998)
Department of Computer Science, The College of William and Mary, Williamsburg, Virginia

Selected Honors and Awards

Bowen Faculty Fellowship (2019)

Benjamin Barney Chair of Mathematics (2014 – 2019)

Robert C. Good Faculty Fellowship (2006, 2014)

Charles A. Brickman Teaching Excellence Award (2013)

Project Kaleidoscope Faculty for the 21st Century (2002)

Courses Taught

FYS 102: First Year Seminar (retired course)

- Algorithmics
- Bioinformatics

CS 111: Discovering Computer Science: Scientific Data and Dynamics
(formerly Foundations of Computing for Scientific Discovery)

CS 112: Discovering Computer Science: Markets, Polls, and Social Networks

CS 171: Introduction to Computer Science (retired course)

CS 173: Intermediate Computer Science

CS 174: Discrete Mathematics (retired course)

CS 200: Topics in Computer Science

- Mathematical Typesetting
- Mac OS X Programming with Cocoa and Objective C
- DNA Algorithms
- Chemoinformatics
- Relational Databases and SQL

CS 234: Mathematical Foundations of Computer Science

CS 271: Data Structures

CS 272: Data Structures and Algorithm Analysis II (retired course)

CS/MATH 275: Elementary Graph Theory (retired course)

CS 281: Computer Organization (retired course)

BIOL/CS 309: Computational Biology

CS/MATH 334: Theory of Computation

CS 371: Design and Analysis of Algorithms

CS 372: Operating Systems

CS 375: Computer Networks

CS 377: Database Systems

CS 401: Natural Language Processing

Book

Discovering Computer Science: Interdisciplinary Problems, Principles, and Python Programming. Chapman & Hall/CRC Textbooks in Computing, Taylor & Francis Group, 2016.

Refereed Publications

Embracing the Liberal Arts in an Interdisciplinary Data Analytics Program. In *Proceedings of the 50th ACM SIGCSE Technical Symposium on Computer Science Education*, 2019.

CS 1: Beyond Programming (special session summary, with Douglas Baldwin, Valerie Barr, Amy Briggs, Bruce Maxwell, and Henry Walker). In *Proceedings of the 48th ACM SIGCSE Technical Symposium on Computer Science Education*, 2017.

Drosophila Muller F elements maintain a distinct set of genomic properties over 40 million years of evolution (with Wilson Leung, *et al.*, Genomics Education Partnership, Washington University). *G3: Genes, Genomes, and Genetics* 5(5), pp. 719–740, 2015.

Improved Upper Bounds for Online Malleable Job Scheduling (with Nathaniel Kell). *Journal of Scheduling* 18(4), pp. 393–410, 2015.

A New Approach for Detecting Riboswitches in DNA Sequences (with Chinmoy Bhatiya, Steven M. Johnson, Joseph D. Sheets, and Jeffrey S. Thompson). *Bioinformatics* 30(21), pp. 3012–3019, 2014.

Bringing Extinct Sponges to Life: StromoGrow, a New Program for Modeling Stromatoporoid Growth (abstract/poster, with Trevor E. Masters and David H. Goodwin). *Geological Society of America Annual Meeting*, Denver, Colorado, 2013.

Markov Processes. Peer reviewed education materials for the Capital University National Science Foundation grant (DUE 9952806): Computational science across the curriculum, 2011.

Optimal Online Ring Routing (with Kevin R. Hutson). *Networks* 57(2), pp. 187–197, 2011.

Online Malleable Job Scheduling for $m \leq 3$. *Information Processing Letters* 111(1), pp. 31–35, 2010.

Computer Scientists Wanted! Strategies for Increasing Interest in Computer Science (panel summary, with Karen Anewalt, Chang Liu, and Jennifer Polack-Wahl). In *Proceedings of the 40th Annual ASEE/IEEE Frontiers in Education Conference*, F3B1–2, October 2010.

An Algorithm for Detecting TPP Riboswitches in Archaea (poster, with Chinmoy I.S. Bhatyia and Jeffrey S. Thompson). *Ohio Collaborative Conference on Bioinformatics (OCCBIO)*, Cleveland, Ohio, June 2009.

Competitive Online Scheduling of Perfectly Malleable Jobs with Setup Times (with Weizhen Mao). *European Journal of Operational Research* 187(3), pp. 1126–1142, 2008.

Technically Speaking: Fostering the Communication Skills of Computer Science and Mathematics Students (with Lewis D. Ludwig). In *Proceedings of the 38th ACM SIGCSE Technical Symposium on Computer Science Education*, pp. 185–189, 2007.

Improved Parallel Job Scheduling with Overhead (with Weizhen Mao and Vesselin Dimitrov). In *Proceedings of the Seventh Joint Conference on Information Sciences*, Research Triangle Park, North Carolina, pp. 393–396, September 2003.

Online Packet Routing on Linear Arrays and Rings. In *Proceedings of the 28th International Colloquium on Automata, Languages and Programming*, Crete, Greece, Lecture Notes in Computer Science vol. 2076, pp. 773–784, July 2001.

A Competitive Online Algorithm for a Parallel Job Scheduling Problem. In *Proceedings of the 12th IASTED International Conference on Parallel and Distributed Computing and Systems*, Las Vegas, Nevada, pp. 611–616, November 2000.

Greedy Online Algorithms for Routing Permanent Virtual Circuits (with Weizhen Mao). *Networks* 34(2), pp. 136–153, September 1999.

On-line Algorithms for Hybrid Flow Shop Scheduling (with Weizhen Mao). In *Proceedings of the Fourth Joint Conference on Information Sciences*, Research Triangle Park, North Carolina, pp. 134–137, October 1998.

Greedy On-line File Transfer Routing (with Weizhen Mao). In *Proceedings of the IASTED International Conference on Parallel and Distributed Systems*, Barcelona, Spain, pp. 225–230, 1997.

A Lower Bound for On-line File Transfer Routing and Scheduling (with Weizhen Mao and Rahul Simha). In *Proceedings of the 31st Annual Conference on Information Sciences and Systems*, Baltimore, Maryland, pp. 936–941, 1997.

On-Line Update of Traveling Salesman Tours. In *Proceedings of the 34th Annual ACM Southeast Conference*, pp. 218–223, Tuskegee, Alabama, 1996.

Supervised Student Research

(with published results)

Finding Unexpected Viral Integrations in Aedes aegypti Genomes, Pritam Basnet, Michelle Rowland, and Khanh Tran, Summer 2019.

Developing a Standalone Version of the Denison Riboswitch Detector, Mitchell Keller, Summer 2015.

Power Management for Online Malleable Job Scheduling, Andrew Quinn, Senior Research (with Recognition), 2013–2014.

A Disequilibrium Multi-Country Macroeconomic Model with Agent-Based Portfolio Investors, Edward Takahashi, Senior Research, Fall 2013.

Bringing Extinct Sponges to Life: Modeling Stromatoporoid Growth with OpenGL, Trevor Masters, DURF Research Assistantship, Summer 2013 (co-advised with David Goodwin, Geosciences)

> Bringing extinct sponges to life: StromaGrow, a new program for modeling stromatoporoid growth (abstract/poster). Geological Society of America Annual Meeting, Denver, Colorado, 2013.

Improved Upper Bounds for Online Malleable Job Scheduling, Nathaniel Kell, Senior Research (with Recognition), 2012–2013

> Improved Upper Bounds for Online Malleable Job Scheduling. *Journal of Scheduling*, to appear, 2014.

A Web Tool for Detecting Riboswitches in Genomic Sequences, Steven Johnson, Summer 2012

> A New Approach for Detecting Riboswitches in DNA Sequences. *Bioinformatics* 30(21), pp. 3012–3019, 2014.

Towards a More Realistic Metric for Online Ring Routing, Andrew Quinn, Summer 2012

Using Computational Algorithms to Further Examine and Visualize Riboswitch Domains, Joseph Sheets, Summer 2011 (co-advised with Jeff Thompson, Biology)

A New Approach for Detecting Riboswitches in DNA Sequences. *Bioinformatics* 30(21), pp. 3012–3019, 2014.

Online Malleable Job Scheduling, Nathaniel Kell, Summer 2011

Generalized Online Malleable Job Scheduling on Three Processors. Proceedings of the Midstates Conference For Undergraduate Research in Computer Science and Mathematics (MCURCSM), 2011.

Online malleable job schedule setup time as a logarithmic function of k processors, Seth Lyles, Summer 2011

Alternative Metrics for Online Ring Routing, Neal Barcelo, Summer 2010 and Senior Research (with Recognition), 2010–2011

Alternative Performance Metrics for Online Ring Routing. Proceedings of the Midstates Conference For Undergraduate Research in Computer Science and Mathematics (MCURCSM), 2010.

Presentation: *Alternative Performance Metrics for Online Ring Routing, part I*, MAA Mathfest Pi Mu Epsilon Paper Session, Pittsburgh, August 2010.

Alternative Metrics for Analyzing Online Ring Routing Algorithms, Bryce Pioske, Summer 2010

Presentation: *Alternative Performance Metrics for Online Ring Routing, part II*, MAA Mathfest Pi Mu Epsilon Paper Session, Pittsburgh, August 2010.

Implementing a Navigation Algorithm for Swarm Robots Inspired by Slime Mold Aggregation, Shaun McFall, Summer 2009 and Senior Research, 2009–2010

Online Routing of Splittable Flows on Torus Networks, Josh Buell, Summer 2009 and Senior Research (with Recognition), 2009–2010

Investigating TPP Riboswitches in Archaea Using Computer Algorithms, Chinmoy Bhatiya, Honors Project, 2008–2009 (co-advised with Jeff Thompson, Biology)

A New Approach for Detecting Riboswitches in DNA Sequences. *Bioinformatics* 30(21), pp. 3012–3019, 2014.

Poster: *An Algorithm for Detecting Riboswitches in Archaea*, Ohio Collaborative Conference on Bioinformatics (OCCBIO), 2009.

Algorithms for Counting Links in K_n, Jeffrey Camealy, Summer 2007

Presentation: *Algorithms for Counting Links in K_n*, Ohio Five Summer Science Research Symposium, Ohio Wesleyan University, July 2007.

Interlocked Linkages: Finding a Key, Amanda Moore, Summer 2007

Presentation: *Interlocked Linkages: Finding a Key*, MAA Mathfest Pi Mu Epsilon Paper Session, San Jose, August 2007. Winner of the SIAM award for outstanding student exposition and research in applied mathematics.

Online Algorithms for Packet Routing on Rings, Mete Tuzcu, Summer 2005

Online Algorithms for Packet Routing on Rings, Pancham Gajjar, Summer 2004

Automatic Service Discovery for Content Addressable Storage, Rahul Parikh, Summer 2003

Interfaces for Content Addressable Storage Providers and Clients (co-advised with Thomas Bressoud), Stoyan Paunov, Summer 2003

An HTTP-Based Protocol for Access of Content Addressable Storage (CAS). Proceedings of the Midstates Conference For Undergraduate Research in Computer Science and Mathematics (MCURCSM), pp. 19–25, 2003.

Content Addressable Storage Provider in Linux (co-advised with Thomas Bressoud), Vesselin Dimitrov, Senior Honors Project, 2002–2003

Mobile Room Condition Inventory System, Rohit Bansal, Senior Honors Project, 2002–2003

Scheduling Jobs on Parallel Machines with Overhead, Vesselin Dimitrov, Summer 2002

Improved Parallel Job Scheduling with Overhead. In *Proceedings of the Seventh Joint Conference on Information Sciences*, Research Triangle Park, North Carolina, pp. 393–396, September 2003.

Online Algorithms for Routing and Scheduling on Ring Networks, Rohit Bansal, Summer 2002

An Online Algorithm for Parallel Job Scheduling, Matthew Winkler, Senior Research, 2000–2001

Issues in Operating Systems Portability, James Deverick, Senior Research, Spring 2000

Grants Awarded

Advancing Student Understanding of Theoretical Morphology: Development of a Three-Dimensional Computer Model of Stromatoporoid Growth (with David Goodwin), Denison University Research Foundation, $7,318 (2013)

Promoting Student Understanding of Theoretical Morphology Using Three-Dimensional Computer Simulations of Stromatoporoid Growth (with David Goodwin), Teagle Lattice Research Award, $2,000 (2013)

Computation for Scientists (Project Coordinator; with Michael Fuson, David Goodwin, Daniel Homan, and Andrew McCall), GLCA New Directions Initiative, $7,950 (2010)

Bringing Bioinformatics to Denison (with Jeff Thompson), GLCA New Directions Initiative, $3,765 (2010)

Computation for Scientists (Project Coordinator; with Michael Fuson, David Goodwin, Daniel Homan, and Andrew McCall), Mellon Faculty Career Enhancement Grant, $31,500 (2010)

Computing and Mathematics Across the Sciences (with Joan Krone), Mellon Faculty Career Enhancement Grant, $18,050 (2009)

Selected presentations

Projects-first in an interdisciplinary data analytics curriculum (invited)
Liberal Arts Data Science workshop, New College of Florida (January, 2018)

Unlocking Potential: Data Analytics
Denison Capital Campaign Kickoff (October, 2017)

What's your DNA doing in my computer? What's your computer doing with my DNA? Wait, what?
Denison Tuesday Lunch Series (January, 2015)

Rethinking CS 1 or Why I'm writing a book
Denison science division (March, 2014)

Natural Computing
Denison Tuesday Lunch Series (March, 2011)

Introducing Computation and Modeling to Liberal Arts Science Students (invited talk)
INFORMS 2010 Annual Meeting (November, 2010)

Computer Scientists Wanted! Strategies for Increasing Interest in Computer Science (panelist)
40th Annual IEEE Frontiers in Education Conference (October, 2010)

ReSearch and Other Reluctant Algorithms
Mathematics and Computer Science FaSt Talk (February, 2010)

CS 111: First Steps Toward (More) Interdisciplinary Computing at Denison
Denison Scientific Association (November, 2009)

CS 111: Foundations of Computing for Scientific Discovery
Mellon workshop: Computing and Mathematics Across the Sciences, Denison University (June, 2009)

That Clever Slime Mold
Denison University Biology 150 (April, 2009)

Computing Across the Sciences: Contributions, Experiences, Opportunities
Denison Scientific Association (October, 2008)

Decoding Life: Algorithmics Applied to Biology
Mathematics and Computer Science FaSt Talk (September, 2008)

Online Ring Routing
Eastern Great Lakes Theory Conference (rump session), Buffalo, New York (September, 2008)

Technically Speaking: Fostering the Communication Skills of Mathematics Students (panelist)
MAA MathFest, San Jose, California (August, 2007)

Technically Speaking: Fostering the Communication Skills of Computer Science and Mathematics Students
38th ACM SIGCSE Technical Symposium on Computer Science Education, Cincinnati, Ohio

(March, 2007)

Online Algorithms for Packet Routing on Rings
Denison Scientific Association (January, 2005)

ReSearch and Other Reluctant Algorithms
Mathematics and Computer Science FaSt Talk (September, 2004)

Online Packet Routing on Linear Arrays and Rings
28th International Colloquium on Automata, Languages and Programming, Crete, Greece (July, 2001)

Online Packet Routing on Linear Arrays and Rings
Department of Math and Computer Science, Denison University (April, 2001)

A Competitive Online Algorithm for a Parallel Job Scheduling Problem
12th IASTED International Conference on Parallel and Distributed Computing and Systems, Las Vegas, Nevada (November, 2000)

A Competitive Online Algorithm for a Parallel Job Scheduling Problem
Department of Math and Computer Science, Denison University (September, 2000)

Online Algorithm Analysis: How Much is a Time Machine Really Worth?
Department of Mathematics, Oberlin Collge (March, 1999)

Analysis of Algorithms for Online Routing and Scheduling in Networks
Department of Computer Science, The College of William and Mary (July, 1998)

Greedy On-line File Transfer Routing
IASTED International Conference on Parallel and Distributed Systems, Barcelona, Spain (1997)

A Lower Bound for On-line File Transfer Routing and Scheduling
31st Annual Conference on Information Sciences and Systems, Baltimore, Maryland (1997)

On-Line Update of Traveling Salesman Tours
34th Annual ACM Southeast Conference, Tuskegee, Alabama (1996)

Other Selected Conferences and Workshops Attended

Liberal Arts Data Science workshop, New College of Florida, January 2018

Data Science at Non-R1 Institutions, Midwest Big Data Hub, Chicago, March 2018

Undergraduate Bioinformatics Education Conference, St. Vincent College, June 2011

Computation for Scientists (organizer), Denison University, June 2010

RECOMB – Bioinformatics Education, San Diego, California, May 2010

Computing and Mathematics Across the Sciences (co-organizer), Denison University, June 2009

Rebooting Computing Summit, Mountain View, California, January 2009

CS2: Denison (panel organizer), Denison University, June 2008

Ohio Collaborative Conference on Bioinformatics (OCCBIO), Oxford, Ohio, June 2007

37th Technical Symposium on Computer Science Education, sponsored by the ACM Special Interest

Group on Computer Science Education (SIGCSE), Houston, Texas, March 2006

35th Technical Symposium on Computer Science Education, sponsored by the ACM Special Interest Group on Computer Science Education (SIGCSE), Charlotte, North Carolina, March 2004

35th Annual ACM Symposium on Theory of Computing, San Diego, California, June 2003

A Computer Science Conversation with GLCA schools (facilitator and host), Denison University, September 2001

32nd Technical Symposium on Computer Science Education, sponsored by the ACM Special Interest Group on Computer Science Education (SIGCSE), Charlotte, North Carolina, February 2001

12th ACM-SIAM Symposium on Discrete Algorithms, Washington, DC, January 2001

44th Annual Symposium of the Central Ohio Chapter of the ACM, Columbus, Ohio, May 2000

30th Technical Symposium on Computer Science Education, sponsored by the ACM Special Interest Group on Computer Science Education (SIGCSE), New Orleans, Louisiana, March 1999

Leadership Positions

Director, Data Analytics program (2016 – 2019)

Convener, Data Analytics proposal committee (2014 – 2016)

Chair, Information Technology Committee (2015 – 2016)

Chair, Ad-hoc Teaching Resources Working Group (2013 – 2014)

Chair, Academic Affairs Council (2012 – 2013)

Convener, Science Chairs (2008 – 2009)

Chair, Department of Mathematics and Computer Science (2006 – 2009)

Chair, Search Committee for Director of Computing Services (Fall, 2004)

Other Selected Service Activities

Referee/reviewer:

- *Asia-Pacific Journal of Operational Research*
- *Information Processing Letters (Elsevier)*
- *Journal of Parallel and Distributed Computing (Elsevier)*
- *Journal of Scheduling (Springer)*
- *European Journal of Operational Research (Elsevier)*
- *Computers & Operations Research (Elsevier)*
- *Journal of Combinatorial Optimization (Springer)*
- *Chapman & Hall/CRC Press*

- *The Handbook of Computer Networks* (Wiley)
- *ACM Transactions on Computing Education*
- *ACM Technical Symposium on Computer Science Education (ACM SIGCSE)*, 2001–2013, 2015
- *ACM Southeast Conference*, 1999
- *College Mathematics Journal (MAA)*
- *Midstates Conference on Undergraduate Research in CS and Math (MCURCSM)*, 2003, 2004, 2007, 2009, 2010, 2013

Invited reviewer for AMS Mathematical Reviews (MathSciNet), 2015 –

CS and DA representative to Neuroscience committee, 2017 – 2019

Denison Service Orientation (DSO) faculty advisor, Washington DC, August 2017

Denison representative (with V. Lele and M. Mei) to Ashesi University, Ghana, August 2016

Information Technology Committee, 2001 – 2004 and 2015 – 2017 (Chair, 2015 – 2016)

External honors examiner, Department of Computer Science, Oberlin College, 2015

Faculty representative to the Academic Affairs Committee of the Board of Trustees, 2013 – 2015

Chair, Ad-hoc Teaching Resources Working Group, 2013 – 2014

Organizer, Tuesday Lunch Series, Fall 2013

Academic Affairs Council, Fall 2005 and 2010 – 2013 (Chair, 2012 – 2013)

University Honor Committee and Academic Integrity Board, 2009 – 2011

Founder and Faculty Advisor, Upsilon Pi Epsilon, Delta of Ohio Chapter, 2000 – 2012

Faculty Advisor, Stibitz Computing Society, 1999 –

June Orientation, 2003 –

August Orientation, 2008 and 2009

Convener of Science Chairs, 2008 – 2009

Trustee, Granville Education Foundation, 2003 – 2009

- President, 2007 – 2009 (2 terms)
- Chair, Grants Committee, 2006 – 2007

Reader, AP Computer Science, 2006 – 2008

Judge, Ohio State Science Fair, 2008

Educational Technology Services Director Search Committee, Fall 2007

Web Services Manager Search Committee, Spring 2006

Panelist, New Faculty Orientation session "Balancing Teaching, Scholarship, and Service", 2006

Representative to GLCA Academic Council, Fall 2005

Chair, Search Committee for Director of Computing Services, Fall 2004

Denison Scientific Association coordinator, 2003 – 2004

Area Coordinator Search Committee, Summer 2003

Search Committee for Director of Residential Life/Assistant Dean of Students, Summer 2003

Committee on Residential Life, Fall 2000 – Spring 2003

Learning Spaces Project Committee, Fall 2000 – Fall 2001

"Learning at Denison" Task Force, Spring 2000

Professional Affiliations

Association for Computing Machinery (ACM)

ACM Special Interest Group on Automata and Computability Theory (SIGACT)

ACM Special Interest Group on Bioinformatics, Computational Biology, and Biomedical Informatics (SIGBio)

ACM Special Interest Group on Computer Science Education (SIGCSE)

ACM SIGCSE Committee on Computing Education in Liberal Arts Colleges

Upsilon Pi Espilon, Honor Society for the Computing Sciences

Council on Undergraduate Research

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