

John E. Wenskovitch Jr.

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Research Overview

Visual analytics, information visualization, and human-computer interaction.

Education

Doctor of Philosophy, Computer Science

Virginia Polytechnic Institute and State University, Hopeful Graduation December 2018
Blacksburg, VA
(at University of Pittsburgh 2011-2014, Virginia Tech 2015-???)

Dissertation Title TBD

Master of Science, Computer Science

University of Pittsburgh, April 2011
Pittsburgh, PA

Understanding the Use of Gyroscopes in Mobile User Interfaces

Bachelor of Science, Software Engineering

(Minor: Mathematics; Application Domain: Multimedia)
Gannon University, May 2009
Erie, PA

Rosetta Fist: An Interactive Sign Language Tutoring Tool using the Nintendo WiiMote

Experience

Academia (Professor)

Visiting Assistant Professor of Computer Science (2014-2016), Adjunct Professor of Computer Science (2016-Present), Allegheny College

August 2014 – Present

- I began a Visiting Assistant Professor position at Allegheny College in the Fall 2014 semester, where I have taught five courses (a total of ten individual classes, nine with labs) across six semesters. I have also run Independent Study courses on Big Data, video game design, and advanced graphics, and was responsible for advising a number of undergraduate students as well as assisting in departmental administrative tasks and events. My classes in the adjunct role have been almost entirely online, a new initiative for Allegheny College.

Adjunct Professor of Mathematics, Chatham University

January 2012 – December 2013

- I taught four different mathematics courses (six individual classes) at Chatham University in the Natural and Physical Science Division. Responsibilities included teaching lectures, office hours, and grading of exams, homework, and quizzes.

Academia (Student)

Graduate Research Assistant, Virginia Tech

August 2016 – Present

- I work with Dr. Chris North in the Discovery Analytics Center in the Computer Science Department, investigating efficient cluster detection and manipulation in force-directed graphs from both information visualization and visual analytics standpoints.

Teaching Assistant, University of Pittsburgh

August 2010 – April 2011, August 2011 – December 2012, May 2013 – August 2014

- I was a Teaching Assistant for ten different courses (eighteen individual classes) at the University of Pittsburgh in the Computer Science Department. Responsibilities have varied by course, but included leading recitations; holding office hours; creation of labs, projects, and exams; and grading exams, homework, projects, and quizzes.

Graduate Student Researcher, University of Pittsburgh

May 2011 – August 2011, January 2013 – April 2013

- I worked on several different research projects for both the Department of Computer Science and the Learning and Research Development Center, under the direction of Drs. G. Elisabeta Marai and Jingtao Wang.

System Administrator Aide, Gannon University

August 2005 – May 2009

- I maintained both software and hardware in the computer labs in the Computer and Information Science Department at Gannon University. My other responsibilities included troubleshooting problems for students and maintaining general lab cleanliness.

Industry

Software Engineer Intern, PRS Pharmacy Services

May 2008 – August 2008, May 2009 – February 2011

- I worked on several ASP.NET systems with thousands of end users, both pharmacists and pharmacies. Included in my work on these systems were requirements gathering, database and software design, implementation, and testing/debugging.

Information Systems Intern, The Children's Institute of Pittsburgh

May 2007 – August 2007

- My primary job was to assist in a system-wide operating system upgrade across multiple sites and departments in a hospital environment. I also assisted with the installation of various other hardware and software, and troubleshooted computer problems for other employees.

Publications

Journal Publications

1. D. Wolf, **J. Wenskovitch**, & B. Anton. "Social media and nurses: Does age, years of experience and education level make a difference?" *JNEP*, 2016 6(2), 68-75.
2. **J. Wenskovitch**, L. Harris, J.J. Tapia, J. Faeder, G.E. Marai. "MOSBIE: A Tool for Comparison and Analysis of Rule-Based Biochemical Models." *BMC Bioinformatics* 2014 **15**:316. (Impact Factor: 2.67)
3. T. Luciani, **J. Wenskovitch**, K. Chen, D. Koes, T. Travers, G.E. Marai. "Fixing TIM: Interactive Exploration of Sequence and Structural Data to Identify Functional Mutations in Protein Families." *BMC Proceedings* 2014 **8**(Suppl 2):S3. (Impact Factor: 2.67)
4. C. Rittle, Y. Lang, **J. Wenskovitch**. "Tdap – The Need to Educate and Immunize." *Workplace Health and Safety*. *Workplace Health and Safety* 2014 Nov;62(11): 468-475. (Impact Factor: 0.856)
5. D. Wolf, **J. Wenskovitch**, B. Anton. "Promoting Health and Safety Virtually: Key Recommendations for Occupational Health Nurses." *Workplace Health and Safety* 2014 Jul;62(7): 302-306. (Impact Factor: 0.856)
6. D. Wolf, B. Anton, **J. Wenskovitch**. "Using Nurse Survey Data to Empower Patients to Become Advocates for Their Own Health." *JHIM* 2014 **28**(1) (Winter 2014).

Conference Publications

1. **J. Wenskovitch**, J. Lombardi, R. Hatfull. "FluxE: Exploring Flux in Astrophysical Simulations." *SIGGRAPH Asia 2016 Symposium on Visualization*.
2. **J. Wenskovitch**, T. Luciani, K. Chen, G.E. Marai. "Fixing TIM: Identifying Functional Mutations in Protein Families through the Interactive Exploration of Sequence and Structural Data." *IEEE BioVis 2013 Data Contest*. **(Vis Experts' Pick)**

Conference Posters and Presentation Abstracts

1. D. Wolf, B. Anton, **J. Wenskovitch**. "Boot Camp for Nurses: Integrating Social Media into Practice." 18th International Conference on Nursing and Healthcare.
2. D. Wolf, B. Anton, **J. Wenskovitch**. "Empowering Patients to Use the WWW Safely to Make Decisions Regarding Their Health." 18th International Conference on Nursing and Healthcare.
3. **J. Wenskovitch**, L. Harris, J. Faeder, G.E. Marai. "A Journaling System for Rule-Based Models." *IEEE BioVis Posters Compendium*, 2013.
4. S. Rothenberger, **J. Wenskovitch**, G.E. Marai. "Pexel and Heatmap Visual Analysis of Multidimensional Gun/Homicide Data." *IEEE Visualization VAST Poster Compendium*, 2011.

Invited Presentations

- 09/22/16:** Research Presentation to BaVA collaborative research group (and regular subsequent presentations) (~20 students & faculty)
- 09/13/16:** Research Presentation to InfoVis@VT research group (and regular subsequent presentations) (~10 students & faculty)

- 05/20/16:** Research Presentation / Artist Talk at ISEA 2016, Hong Kong (~75 in audience)
- 03/01/16:** Junior Seminar Presentation on Information Visualization (~10 students and faculty)
- 10/30/15:** Research Presentation of RuleBender and MOSBIE at UIC (University of Illinois at Chicago), Chicago, IL (~10 senior researchers in audience)
- 10/17/15:** Research Presentation / Artist Talk at Stimulus|Response|Affect, Oakland University, Auburn Hills, MI (~75 in audience +unknown webcast viewers)
- 08/17/15:** Research Presentation / Artist Talk at ISEA 2015, Vancouver, BC (~50 in audience)
- 04/02/15:** Junior Seminar Presentation on Graphics and Information Visualization (~15 students and faculty)
- 04/09/14:** Guest Lecture to Allegheny College CS112 Course (~40 students and faculty)
- 02/05/14:** Research Presentation to the Pittsburgh Biophysical Theory Club (~50 in audience)
- 10/14/13:** IEEE BioVis 2013 Data Contest Presentation, Atlanta, GA (~150 in audience)
- 05/17/11:** Research Presentation to the University of Pittsburgh MIPS Research Group (and regular subsequent presentations) (~10 students & faculty)
- 04/20/11:** Research Presentation to the University of Pittsburgh iVRL Lab (and regular subsequent presentations) (~10 students & faculty)

Teaching

Instructor (at Allegheny College)

- 2017:** Introduction to Computer Science II (Spring)
- 2016:** Principles of Computer Organization (Fall), Introduction to Computer Science II (Spring), Analysis of Algorithms (Spring)
- 2015:** Visual Computing (Fall), Introduction to Computer Science II (Spring and Fall), Analysis of Algorithms (Spring)
- 2014:** Theory of Computation (Fall), Principles of Computer Organization (Fall)

Visual Computing

- **Topics Covered:** An introduction to the fundamentals of computer graphics, visualization, and visual computing. Topics covered include concepts of light, color, two- and three-dimensional representations, data visualization, image processing, image rendering, and animation. These concepts are illustrated using medical imaging, simulation, human vision processing, computer art, and other applications. Laboratory assignments covering each major course topic provide a solid basis for advanced work in computer graphics and visualization.

Introduction to Computer Science II

- **Topics Covered:** A continuation on the basic principles of computer science, expanded to emphasize data structures, data abstraction, algorithm design, the analytical and experimental evaluation of algorithm performance, and object-oriented design and implementation techniques.

Analysis of Algorithms

- **Topics Covered:** Selected topics from the analysis of algorithms, including models of computation, design of efficient algorithms and algorithmic programming methodology, computational complexity and mathematical analysis of algorithms, and NP-completeness.

Theory of Computation

- **Topics Covered:** The theories of finite-state machines, pushdown automata, and Turing machines, as well as the relation between automata and the formal languages that they recognize. Also covered are topics related to computational theory, lexical analysis and parsing, and reductions.

Principles of Computer Organization

- **Topics Covered:** Basic organization and operation of computers, including logical structure, hardware components, machine and assembly language, computer system performance, internal representation of information, instruction set architecture computer arithmetic, and design and operation of control units.

Instructor (at Chatham University)

2013: College Algebra (Fall), Precalculus (Spring)

2012: Discrete Mathematics (Fall), Elementary Statistics (two Fall, one Spring section)

College Algebra

- **Topics Covered:** Functional and inverse relationships, the construction and solution of functional equations, the application of functions in modeling relationships and processes, systems of equations and inequalities, and the graphical representations of numerical relationships.

Precalculus

- **Topics Covered:** The coordinate system, functions and their graphs, solutions of equations and inequalities, trigonometric functions and their graphs, trigonometric identities, and the historical and cultural significance of mathematics

Discrete Mathematics

- **Topics Covered:** Propositional and predicate logic, mathematical writing, sets and Boolean algebra, functions and relations, combinatorics, probability, and graphs and trees.

Elementary Statistics

- **Topics Covered:** Exploratory data analysis, probability and combinatorics, discrete and continuous probability distributions, confidence intervals, and hypothesis testing.

Teaching Assistant (at University of Pittsburgh)

2014: Programming and System Design on a Mobile Robot Platform (Summer),
Interdisciplinary Modeling and Visualization (Graduate-level course, Spring),
Introduction to the Theory of Computation (Spring)

2013: Introduction to Computer Graphics (Fall), Algorithm Implementation (Summer)

2012: Introduction to Systems Software (Fall), Algorithm Implementation (Summer),
Computer Organization and Assembly Language (Spring)

2011: Operating Systems (Graduate-level course, Fall), Discrete Structures for
Computer Science (one Fall and one Spring section)

2010: Intermediate Programming Using Java (Fall)

TA Duties included some subset of: {grading projects, homeworks, and exams, holding office hours, designing labs and exams, moderating class wikis, leading recitations and review sessions, occasionally teaching a class session when the instructor was out of town, and assisting students with debugging and other technical issues}

Programming and System Design on a Mobile Robot Platform

- **Topics Covered:** Open- and closed-loop control, sensing, localization, planning, multi-robot control, human-robot interaction, learning, robot platforms, and robots in the real world.

Interdisciplinary Modeling and Visualization (Graduate Course)

- **Topics Covered:** Human vision and color, visual perception and attention, multi-dimensional data visualization, interaction, user interface design, surfaces and volumes, evaluation and user studies, and uncertainty visualization.

Introduction to the Theory of Computation

- **Topics Covered:** Regular and context-free languages, state machines, pushdown automata, Turing machines, decidability, reducibility, and computational complexity.

Introduction to Computer Graphics

- **Topics Covered:** Graphics framework, OpenGL basics, geometric transformations, scan conversion, particle systems, texture mapping, ray tracing, and photorealism.

Algorithm Implementation

- **Topics Covered:** Exhaustive search, pruning, recursion and backtracking, search trees and tries, hashing functions, substring matching, compression, encryption, graph representations, path algorithms, and dynamic programming.

Introduction to Systems Software

- **Topics Covered:** C syntax and control structures, memory management, static and dynamic linking, data representation, interaction with operating systems, device drivers, signal handling, threading, and communication and networking.

Computer Organization and Assembly Language

- **Topics Covered:** MIPS syntax and control structures, binary arithmetic, context switching, logic design, processor data paths, processor controls, and pipelining.

Operating Systems (Graduate Course)

- **Topics Covered:** Introduction to distributed systems, clocks and clock synchronization, distributed mutual exclusion, consistency, replication, load balancing, fault tolerance, and DDoS.

Discrete Structures for Computer Science

- **Topics Covered:** Logic, proofs, sets, relations, functions, counting, and probability, with an emphasis on application in computer science.

Intermediate Programming Using Java

- **Topics Covered:** Java syntax and control structures, methods, classes, arrays, and simple user interfaces and graphical components.

Grants and Funding Awards

1. “Demmler Award for Teaching Innovation,” Allegheny College grant towards new course and curriculum development. \$4,000.

Professional Distinctions and Awards

- 2015:** Awarded a summer residency at Ars Bioarctica in Kilpisjärvi, Finland to work on the Immor(t)al project.
- 2013:** Received the BioVis Data Contest Vis Experts’ Pick Award
Named TA Mentor for the Department of Computer Science, 2013-2014
Received the Computer Science Department Digital Media Competition runner-up
- 2012:** Received the Computer Science Department Teaching Assistant Award, 2011-2012
- 2009:** Eight consecutive semesters on Gannon University Dean’s List
- 2007:** Who’s Who Among Students at American Universities & Colleges
- 2004:** Gannon University Engineering Design Scholarship, 1st prize

Technical Skills

Languages: Java, C#, C++, ASP.NET, XHTML/CSS
Operating Systems: Windows, UNIX/Linux (Ubuntu), Android, OSX, MS-DOS
Software: MS Visual Studio 2003-2012, Eclipse (with RCP), MS SQL Server
Visualization Packages: Prefuse, Processing, OpenGL, D3

Open Source Software

RuleBender: A free visualization tool for constructing, debugging, simulating, and analyzing rule-based biological models. Distributions for Windows, Linux, and OSX, 32-bit and 64-bit. The system has 1000+ downloads in 2012 alone and is used at more than 40 institutions.

<http://www.rulebender.org>

FixingTIM: A free visualization tool for exploring families of proteins. Release is currently Linux only, but functions well in a virtual environment.

<http://vizwizards.com/fixingTIM.html>

MOSBIE (Model Simulation Browser and Interactive Explorer): A free extension of RuleBender for browsing families of rule-based models, identifying similar structures across the individual models. <http://visualizlab.org/mosbie>

FluxE (Flux Explorer): A software package for visualizing effective temperature and spectral flux density values computed from astrophysical simulations, focusing on stellar merger simulations. <http://starsmasher.allegheny.edu/fluxe/>

Art Projects and Associated Shows and Talks

TweetShot: A fictional gun control device which automatically posts a tweet to a dedicated account when the trigger of a toy gun is pulled. The project is intended to be a glimpse into gun culture and the potential in public shaming, or conversely, glorification of an act of violence in the social media sphere. Collaboration with Byron Rich.

- ELECTRODOME, Gothenburg, Sweden (January-May 2015)
- Stimulus|Response|Affect, Oakland University, Rochester, MI (October 2015)

Immor(t)al: This project scrutinizes the historical and current shifts in medical research and ethics as pertaining to definitions of informed consent and body sovereignty, while broadening media and scientific literacy by deploying other misunderstood tools (the EEG) in a creative manner. Information obtained from the EEG is used to manipulate growing conditions for a colony of HeLa GFP cancer cells inside a custom-designed incubator. Collaboration with Byron Rich and Heather Brand.

- Phantom Vibrations, State University of New York at Buffalo, Buffalo, NY (April-May 2015)
- Artist Talk, ISEA2015, Vancouver, BC, Canada (August 2015)
- Artist Talk, ISEA2016, Hong Kong (May 2016)

The Interrupted Living Machine: A project designed to draw attention to climate change and pollution. Software scrapes Twitter and Instagram looking for hashtags related to environmental degradation. When a critical number of hashtags have been counted, noise is generated in the signal transmitted from temperature, humidity, and pH sensors in a greenhouse, causing both false readings and the greenhouse to improperly react to the false stimulus. Collaboration with Byron Rich.

- Artist Talk, ISEA2016, Hong Kong (May 2016)

Resonant: This project is an audio-zation of the vessel in waveform. A simple line drawing mapping the form of each vessel was made then imported into a custom program converting the drawing into a .wav audio file. Parameters were set based on the intrinsic tonality of the vessel. For example: if the vessel was rung like a bell and its tone was an E₄, meaning it has a frequency of 311.127 Hz, the program uses this numeric value to give tonality to the waveform. Essentially, each vessel is playing the sound of itself. Collaboration with Ian F. Thomas.

- NCECA (National Council on Education for the Ceramic Arts) 2016, Kansas City Convention Center, Kansas City, MO (March 2016)

Professional Affiliations

2016-Today: RVAS (Roanoke Valley Astronomical Society)

2015-Today: International Dark-Sky Association

2014-Today: The Astronomical League

2014-Today: ORAS (Oil Region Astronomical Society)

2013-Today: IEEE, IEEE Computer Society, ACM SIGGRAPH

2012-Today: SIAM (Society for Industrial and Applied Mathematics)

2011-Today: AAAP (Amateur Astronomer's Association of Pittsburgh)
(Wagman Observatory committee 2014-Today)

2009-Today: The Planetary Society

2005-Today: ACM

University Affiliations

2016-Today: Virginia Tech Discovery Analytics Center

2015-Today: Virginia Tech Department of Computer Science

2014-Today: Allegheny College Department of Computer Science
InfoVis Lab @ Virginia Tech

2012-2013: Chatham University Department of Mathematics

2011-2014: University of Pittsburgh MIPS (Mobile Interface & Pedagogical Systems) Group
University of Pittsburgh iVRL (Interdisciplinary Visualization Research Lab)

- 2009-2014:** University of Pittsburgh Department of Computer Science
- 2005-2009:** Gannon University Department of Computer and Information Sciences
Gannon University Department of Mathematics
Gannon University Honors College

Institutional Service

Allegheny College:

- Coach, Computer Science Programming Contest Team (2014)
- Computer Science representative, Open House visit (2015)

University of Pittsburgh:

- Computer Science Graduate Student Organization (2012-2014)
 - President (2012-2013), Secretary (2013-2014)
- College of Arts & Sciences Graduate Student Organization (2012-2014)
 - Teaching Awards Committee Chair (2013-2014)
- Graduate & Professional Student Government (2012-2014)

Gannon University:

- Association for Computing Machinery Student Chapter (2005-2009)
 - Chair (2007-2008)
 - Vice-Chair (2005-2007)
 - Secretary (2008-2009)
 - Computer Science Games participant (2007, 2008, 2009)
- Environmental Club (2005-2009)
 - President (2006-2008)
- Honors College (2005-2009)
 - Student Advisory Board (2007-2009)
 - *Excalibur* Newsletter Co-Editor (2006-2009)
- G.I.V.E. Day Volunteer (2005-2009)
- Computer and Information Sciences Open House Volunteer (2006-2009)
- Engineering Summer Camp Volunteer (2006-2008)

Conference Service

IEEE Vis (formerly IEEE VisWeek):

- Student Volunteer (2012)
- Student Volunteer Shift Supervisor (2013-2014)
- Student Volunteer Committee Co-Chair (2015-2017(?))

SIGGRAPH Asia:

- Student Volunteer (2013, 2015)
- Student Volunteer Team Leader (2014, 2016)

Miscellaneous Volunteering and Service

- 2011-Today:** Wagman Observatory Telescope Operator (and other AAAP/ORAS/RVAS public star party events and outreach activities)
- 2001-Today:** City of Lower Burrell Recycling Day Volunteer
- 1999-2005:** Pennsylvania Game Commission Safety Program, Junior Instructor

Supervised Theses (First and Second Reader)

1. Katherine Beisler. "Fault or No Fault? A Measure of Human Ability to Detect Layout Faults in Web Pages," Technical Report CS2016-02, Department of Computer Science, Allegheny College, 2016.
2. Andreas Landgrebe. "Empirical Study of Tools to Assist Java Programmers in Finding Bugs," Technical Report CS2016-08, Department of Computer Science, Allegheny College, 2016.
3. Alexander Means. "A Virtual Campus Tour," Technical Report CS2016-09, Department of Computer Science, Allegheny College, 2016.
4. Tristan Challener. "An Eclipse-Based Integrated and Automated Fault Localization System," Technical Report CS2015-02, Department of Computer Science, Allegheny College, 2015.
5. Michael Ligouri. "Evaluating File System Performance in Windows and Ubuntu with Varied RAM Allocation," Technical Report CS2015-05, Department of Computer Science, Allegheny College, 2015.

Undergraduate Advising

- 2016-2017:** Claire Pickhardt, Dillan Smith (4th year); Bryce Evans (3rd year)
2015-2016: Claire Pickhardt, Dillan Smith (3rd year); Evan Fann, Bryce Evans (2nd year)
2014-2015: Claire Pickhardt, Michael Coddington, Dillan Smith (all 2nd year)

Outreach Activities

- 07/05/16:** Computational Astrophysics presentation to American Scholar group (one other such event) (~30 students)
06/03/16: Tour of the Physics & Astronomy Department, presenting computational astrophysics (~80 students)
03/31/15: Allegheny College Gator Day Research Presentation on protein modeling and visualization (~75 students and faculty)
05/11/13: Introduction to Animation and Video Games Tutorial, Technology Leadership Initiative workshop (~20 students)
01/18/12: Research Presentation to the SciTech Science Forum, Pittsburgh Academy for Science and Technology (~150 students)

Curriculum Development

- Began an initiative towards online education at Allegheny College.
- Assisted in a revision of Computer Science course titles, descriptions, and a general restructuring of Computer Science curriculum at Allegheny College.
- 2015 Demmler Award for Teaching Innovation, used towards developing a new series of Computer Science theory courses.
- Attended NSF-funded Faculty Training Workshop on Processing, June 21-24 2015, Southern Methodist University, Dallas, TX, used towards developing a Visual Computing course in Fall 2015.

Personal Interests

Science fiction (books, TV, and movies), amateur astronomy, hiking, hockey and soccer, live music, roadtrips and travel, jogging, model building

Last updated: December 2016