

Michael Wehar
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SUMMARY I am currently a Visiting Assistant Professor at Swarthmore College where I teach courses, pursue research, and mentor students. My current research focuses on Algorithms, Formal Language Theory, and Generative Art. My recent teaching includes Theory of Computation, Data Structures & Algorithms, and Software Engineering.

EDUCATION **PhD**, Computer Science and Engineering, University at Buffalo
Supervisor: Dr. Kenneth Regan
Dates: Aug 2013 - Dec 2016

MS & BS, Mathematical Sciences, Carnegie Mellon University
Dates: Aug 2009 - May 2012 (graduated early)

TEACHING **Visiting Assistant Professor** at Swarthmore College (**Aug 2019 - Present**): Teaching Theory of Computation (CS46), Data Structures & Algorithms (CS35), and Software Engineering (CS71). Leading directed readings on Algorithmic Drawing, Broadcasting Technology, User Experience & Interaction Design, and Video Game Design & User Engagement. Supervising student-run courses Foundations of Technological Entrepreneurship, Applied Social & Tech Entrepreneurship, and Product Design & Launch.

Assistant Professor of Instruction at Temple University (**Jul 2018 - Jun 2019**): Teaching Data Structures (CIS 2168) and Software Design (CIS 3296).

Part-time Instructor at University of Pittsburgh (**Fall 2017**): Teaching Algorithm Implementation (CS1501) as an adjunct instructor.

Adjunct Faculty at Rochester Institute of Technology (**Summer 2015**): Teaching Computer Science Theory (CSCI 262) as an adjunct instructor.

Teaching Assistant at University at Buffalo (**Aug 2013 - Dec 2016**): Assisting with Introduction to Computer Science, Discrete Structures, Theory of Computation, and Software Engineering Concepts.

Teaching Assistant at Carnegie Mellon University (**Spring 2010 & Fall 2012**): Assisting with Concepts of Mathematics and Honors Matrix Theory.

RESEARCH PAPERS

Core Research Topics: Algorithms & Formal Language Theory

A. Abdelmonsef, X. Dong, D. Průša, M. Wehar, and C. Xu. Algorithms for Efficient Pattern Matching within Matrices. Under Review. 2024.

A. Salamon and M. Wehar. Effective Guessing Has Unlikely Consequences. TOCS 2023. (Commemorative Issue for Alan L. Selman)

A. Salamon and M. Wehar. Superlinear Lower Bounds Based on ETH. STACS 2022.

M. Oliveira and M. Wehar. On the Fine Grained Complexity of Finite Automata Non-emptiness of Intersection. DLT 2020.

D. Průša and M. Wehar. Complexity of Searching for 2 by 2 Submatrices in Boolean Matrices. DLT 2020.

F. Mráz, D. Průša, and M. Wehar. Two-dimensional pattern matching against basic picture languages. CIAA 2019. (Journal Version: TCS 2021)

M. Oliveira and M. Wehar. Intersection non-emptiness and hardness within polynomial time. DLT 2018.

D. Chistikov, W. Czerwinski, P. Hofman, M. Pilipczuk, and M. Wehar. Shortest paths in one-counter systems. FoSSaCS 2016. (Journal Version: LMCS 2019)

J. Swernofsky and M. Wehar. On the complexity of intersecting regular, context-free, and tree languages. ICALP 2015 (Track B).

M. Wehar. Hardness results for intersection non-emptiness. ICALP 2014 (Track B). **(Best Student Paper Award)**

SUPERVISING RESEARCH

Supervised 14 undergraduate students on research projects that were accepted for presentation at competitive academic conferences.

AlgoArt Project (Algorithms & Generative Art)

Student Collaborators: X. Dong, O. Khan, X. Li, J. Moreno, M. Newman-Toker, R. Oet, V. Sumano, L. Suresh, A. Zhang (also with E. Brickner and J. Mancini).

- Generative Clothing Designs (GCD) by AlgoArt. Bridges 2024 (Fashion Show).
- AlgoArt - Nine Drawing Algorithms. Bridges 2023 (Short Film Festival).
- Algorithmically Generated Visual Designs. CCSCNE 2023.
- Algorithmically Generated Artwork. CCSC:EA 2022. **(Best Faculty Poster Award)**
- A Visualization of Algorithmically Generated Artwork. IFoRE 2022 (STEM Art and Film Festival). *(2nd Place Artwork, Honorable Mention)*

Additional Projects (Algorithms, Linguistics, and Software Engineering)

- T. Hüttenrauch and M. Wehar. An Online Dictionary for Dialects of North Frisian. EURALI Workshop @ LREC 2022. *(Short Paper)*
- M. Quiroz and M. Wehar. Analyzing Group and Individual Contributions within Group Programming: RepoRabbit Web Application. ITiCSE 2022. *(Short Paper)*
- M. Quiroz. Analyzing Group and Individual Contributions within Group Programming. NCUR 2022.
- C. Brandt. Machine Assisted Speed Reading and Training. NCUR 2021.
- A. Liloia. Efficient Algorithms for the Four Corners Problem and Two-Dimensional Pattern Matching. NCUR 2021.
- O. Peterson. Automatic Crossword Puzzle Construction. NCUR 2021.

PATENTS

M. Hailpern, M. Hernandez-Sherrington, Y. Li, M. Wehar, and H. Zhu. Constraint tracking and inference generation. U.S. Patent 11,074,508. July 27, 2021.

M. Wehar. Human and Computer Cooperative Artistic Creation. U.S. Provisional Patent Appl. No. 62/590,577. Filed November 2017.

HONORS & AWARDS

- Best Faculty Poster CCSC:EA 2022 and Best Student Paper ICALP 2014 (Track B).
- Faculty Research Support Award from Swarthmore College (awarded five times), additional grants awarded from Aydelotte Foundation and Swarthmore's TLC, small grant awarded by NSF I-Corps Northeast Regional Program, and cooperation partner on grant awarded by German Research Foundation (DFG).
- Elected as President of University at Buffalo's Computer Science Graduate Student Association representing approximately 400 computer science graduate students.
- Selected for University at Buffalo's Computer Science & Engineering Graduate Leadership Award, Dean's Scholars Award, and Department Commencement Speaker.
- Hackathon projects awarded "People's Choice Award" at Webex Apps 2022 and "Most Time-saving Hack" at UB Hacking 2016.

SERVICE

Volunteer Judge & Mentor (Sep 2016 - Present):

- Mentor for 75+ student software projects consisting of 250+ total students.
- Judge and mentor for college hackathons, high school hackathons, Major League Hacking online hackathons, and college innovation competitions.

Faculty Advisor at Swarthmore College Radio Station (Fall 2021 - Present):

- Supervisor of operations for the college's historic WSRN radio station (91.5 FM) which currently broadcasts to the radio and internet with 50+ student broadcasters.
- Contribute by maintaining technology equipment, guiding student web developers, establishing broadcasting standards, and helping to ensure FCC-compliance through filing forms, quarterly reports, and successfully carrying out relicensing.
- Host my own radio show from WSRN's studio that broadcasts live musical performances and interviews with local guests for listeners in Delaware County, PA.

Departmental Service at Swarthmore College (Fall 2019 - Present):

- Serving as an undergraduate advisor and a sophomore plan advisor.
- Served as the department event planner from Fall 2019 to Spring 2024.
- Created an Algorithms Research Group and advised Google Developer Student Club.

Departmental Service at Temple University (Fall 2018 - Spring 2019):

- Served on CIS Undergraduate Curriculum Committee.

Additional Service: Founder of a young adults social group with 3,000 members, writer for Artificial Intelligence+ Blog, and percussionist for Merion Concert Band.

INDUSTRY EXPERIENCE

Founder at WordofTheHour.org [JS, PHP, Python] (Jun 2017 - Present):

Language learning app for learning vocabulary words across multiple languages.

- Built and published apps that support 10+ platforms.
- Grew community to over 40,000 total users across all platforms.
- Community crowdsourcing resulted in over 40,000 user submitted translations enabling us to support vocabulary words in over 10+ languages.

CTO, Board Member at Rodgers Insurance Group (**Aug 2021 - Present**):

Established by my family in 1957, Rodgers Insurance Group is one of the largest independent and locally owned insurance agencies located in western Pennsylvania. Serving as a fractional CTO (as needed) and Board Member assisting with:

- Hiring (sourced and helped hire 13 new employees)
- Technology Management (assisting with web development, IT policy, security audits, technology purchasing, and record management)

Software Consultant at WordReference.com [JS, PHP] (**Nov 2018 - Jun 2019**):

- Worked directly with the founder of WordReference.com developing web-based technologies related to spell checking and autocomplete.

Computer Vision Programmer at Capsen Robotics [C++] (**Jan 2017 - Jul 2018**):

- Worked with a small team on C++ development and testing of our core computer vision technologies for object recognition, 3D scanning, and bin picking.
- Contributed to custom built machine learning algorithms, CUDA programming, robot motion planning, and robot simulation.
- In addition to software development, I filmed a product video, co-mentored summer interns, and assisted with a patent application.

INTERNSHIPS

Research Intern at IBM Research [Java] (**Summer 2016**):

- Worked with the text analytics research group to develop a query language and engine for verifying constraints related to text data.
- Developed a software system in Java that combines parsing, query evaluation, data management, and inference. A patent was filed and issued based on this work.

Technical Evangelist Intern at Meed Inc Startup (**Spring 2016**):

- Content writer for software engineering online community offering advice to undergraduate computer science students.

Software Developer at Soglo Startup [Java, Android] (**Winter 2013**):

- Developed an Android App prototype for bluetooth communication with a wearable apparel device. App integrated with API's for accelerometer, voice, and weather.