

Zachary Levonian

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<https://z.umn.edu/zlevonian>

Expertise: human-computer interaction, data science, natural language processing

Education

- **(Ongoing) PhD in Computer Science** Minneapolis, MN
University of Minnesota *Sep. 2017–Present*
 - Researching human-computer interaction (HCI) and social computing
 - Co-advised by Professors Loren Terveen and Lana Yarosh
 - Coursework: HCI & UI Technology, Social Computing, Machine Learning, Social Network Analysis, Embodied Computing, Database Systems, Statistics & Regression
- **B.A. in Computer Science** Northfield, MN
Carleton College *Sep. 2010–Jun. 2014*
 - Graduated *magna cum laude*
 - Core coursework: Data Structures, Programming Languages, Computer Organization and Architecture, Algorithms, Software Design, Computability and Complexity, Mathematics of Computer Science, Calculus (Multivariable)
 - Advanced coursework: Natural Language Processing, Data Mining, Artificial Intelligence, Parallel and Distributed Computing, Operating Systems, Mobile Application Development

Industry Experience

- **Amazon** Virtual
Applied Scientist Intern *Sep. 2020–Dec. 2020*
- **The MITRE Corporation** McLean, VA
Computer Scientist *Jan. 2015–Jul. 2017*
 - Designed and developed prototype Automatic Speech Recognition (ASR) safety systems as researcher in the Center for Advanced Aviation System Development (CAASD).
 - Improved ASR performance on air traffic controller and pilot radio transmissions through the application of cutting-edge techniques from academia.
 - Architected and implemented a Hadoop-based capability for large-scale processing of air traffic controller radio transmissions data.
 - Implemented language modeling (rule-based) and semantic parsing systems (statistical)
- **General Dynamics Mission Systems** Fairfax, VA
Software Developer *Oct. 2014–Jan. 2015*
 - Provided design, integration, and software development support for research & development team exploring Activity-Based Intelligence capabilities.

- Researched querying geospatial data efficiently in graph databases.

Publications (Refereed Conference and Journal)

- **Z. Levonian**, M. Dow, D. Erikson, S. Ghosh, H. Miller Hillberg, S. Narayanan, L. Terveen, S. Yarosh, “Patterns of Patient and Caregiver Mutual Support Connections in an Online Health Community,” to appear in *23rd ACM Conference on Computer-Supported Cooperative Work and Social Computing - CSCW*, 2020.
 - Quantitative social network analysis of an online health community.
 - Methods: regression, ML classification, social network analysis, content analysis
 - Analysis code available: <https://z.umn.edu/connection2020code>
- **Z. Levonian**, D.R. Erikson, W. Luo, S. Narayanan, S. Rubya, P. Vachher, L. Terveen, S. Yarosh, “Bridging Qualitative and Quantitative Methods for User Modeling: Tracing Cancer Patient Behavior in an Online Health Community,” *Proceedings of the 14th International AAAI Conference on Web and Social Media - ICWSM*, 2020. z.umn.edu/bridging2020
 - Developed method to incorporate qualitative themes into quantitative user modeling.
 - Conducted a comparison of ML and keyword-based classification approaches.
 - Analysis code available: <https://github.com/levon003/icwsm-cancer-journeys>
- C.E. Smith, **Z. Levonian**, H. Ma, R. Giaquinto, G. Lein-McDonough, Z. Li, S. O’Conner-Von, S. Yarosh, “‘I Cannot Do All of This Alone’: Exploring Instrumental and Prayer Support in Online Health Communities,” to appear in *ACM Transactions on Computer-Human Interaction - TOCHI*, 2020.
 - Conducted statistical analysis on survey of patients and their support networks.
 - Methods: frequentist statistics, survey design, visualization
- H. Miller Hillberg, **Z. Levonian**, D. Kluver, L. Terveen, and B. Hecht, “What I See is What You Don’t Get: The Effects of (Not) Seeing Emoji Rendering Differences across Platforms,” in *Computer Supported Cooperative Work 2018*, New York, 2018.
 - Conducted statistical analyses of survey response data.
- S. Chen, H. D. Kopald, R. S. Chong, Y.-J. Wei, and **Z. Levonian**, “Readback Error Detection using Automatic Speech Recognition,” in *Air Traffic Management Research and Development Seminar 2017*, Seattle, 2017.
 - This paper captures the research activities of our research team applying acoustic model adaptation and training techniques to ASR for air traffic control.
 - Conducted literature review and drafted background on acoustic modeling for ASR.
- S. Chen, H. D. Kopald, A. Elessawy, **Z. Levonian**, and R. M. Tarakan, “Speech Inputs to Surface Safety Logic Systems,” in *IEEE/AIAA 34th Digital Avionics Systems Conference (DASC)*, Prague, Czech Republic, 2015.
 - Computed the quantitative automatic speech recognition (ASR) results presented in this conference paper.

Publications (Poster)

- R. Wan, **Z. Levonian**, S. Yarosh, “How much is a ”like” worth? Engagement and retention in an online health community,” poster in the *23rd ACM Conference on Computer Supported Cooperative Work and Social Computing - CSCW*, 2020.
 - Fit survival analysis models to predict user retention from engagement data.
- M. Butzer, **Z. Levonian**, Y. Luo, K. Watson, Y. Yuan, C.E. Smith, S. Yarosh, “Grandtotem: Supporting International and Intergenerational Relationships,” poster in the *23rd ACM Conference on Computer Supported Cooperative Work and Social Computing - CSCW*, 2020.
 - Designed and developed a prototype to facilitate intergenerational communication.
- P. Vachher, **Z. Levonian**, H.-F. Cheng, S. Yarosh, “Understanding Community-Level Conflicts Through Reddit r/place,” poster in the *23rd ACM Conference on Computer Supported Cooperative Work and Social Computing - CSCW*, 2020.
 - Quantified conflicts using social media log data analysis.
- C. Li, **Z. Levonian**, H. Ma, S. Yarosh, “Condition Unknown: Predicting Patients’ Health Conditions in an Online Health Community,” poster at *Computer Supported Cooperative Work 2018*, New York, 2018.
 - Trained and evaluated text classifiers for online post authors’ health conditions.

Mentorship & Teaching

- **Research mentor of undergraduates** Minneapolis, MN
 - *University of Minnesota ProDUCT Lab* *Sep. 2017–Present*
 - Honorable Mention in the 2020 CRA Outstanding Undergraduate Researcher Awards for my student D. Erikson
 - Mentored 14 undergraduate and Master’s students under supervision of advisors
 - Student work published in 2 full conference papers and 3 posters (see publications)
 - Mentored for UMN Big Data REU 2019: real-world dataset exploration and cleaning
 - Mentored M. Dow’s M.S. thesis work: <https://z.umn.edu/dowThesis2020>
 - Mentored independent study with K. Vuong and K. Qi: propensity score matching & DeepMoji analysis of text corpus (in preparation for submission)
 - **TA for CSCI1001: Overview of Computer Science** Minneapolis, MN
 - *University of Minnesota CS Department* *Jan. 2018–May 2018*
 - Managed five undergraduate TAs along with grading and lab section logistics.
 - Designed database problem set for new unit in the course.
 - Updated course webpage and assignment descriptions.
 - Handled grading questions and other course conflicts.
 - Maintained weekly office hours period for myself and other TAs.

- **Prefect for *CS202: Mathematics of Computer Science*** Northfield, MN
Carleton College CS Department Jan. 2014–Mar. 2014
 - Organized weekly prefect sessions of 5-15 students to review the material of this foundations-level course.
 - Selected practice problems and assembled review sheets before major exams.
 - Covered topics: logic and proofs, number theory, elementary complexity theory and recurrence relations, basic probability, counting techniques, and graphs.

Research Funding & Awards

- **Research Assistant** Minneapolis, MN
University of Minnesota CS Department Sep. 2017–Present
 - Researching social support, online communities, classification methods, and value sensitive design.
- **Early Career Research Program funding recipient** McLean, VA
\$83,000 of Funding Oct. 2016–Sep. 2017
 - Proposed research applying contemporary semantic parsing techniques to transcriptions of air traffic controller radio transmissions in order to extract meaning.
 - Implemented and compared NLP techniques to an existing corpus of air traffic controller communications.
- **Distinction in integrative exercise** Northfield, MN
Carleton College CS Department Sep. 2013–Mar. 2014
 - Distinction awarded by reviewing faculty of the Carleton College CS department.
 - 11 students received distinction of 28 total students.
 - Cooperated with a six-person team to complete a twenty-week capstone development project.
 - Designed an integrated development environment (IDE) to introduce basic developer tools for students learning Python.
 - Expanded a 10,000-line Java codebase with additional features.
 - Assessed usability via user-testing on Python learners enrolled in *CS111: Introduction to Computer Science*.

Other Experience & Service

- **Graduate Research and Discussion Seminar Co-facilitator** Minneapolis, MN
University of Minnesota Jan. 2019–Present
 - Organized biweekly seminar discussion for graduate Computer Science researchers.
- **Reviewer**
SIGCHI Conferences Jan. 2019–Present
 - Reviewed 10+ full papers for ICWSM 2019, ICWSM 2020, and CSCW 2020.
- **Undergraduate Researcher** Bozeman, MT
Montana State University REU Program Jun. 2013–Aug. 2013

- Designed and implemented a testing framework to emulate various types of network degradation in the local area network of the research lab.

- CS Lab Assistant** Northfield, MN
 • *Carleton College Information Technology Services* *Mar. 2014–Jun. 2014*
 - Assisted students working on coding assignments for a variety of CS classes.
 - Communicated debugging techniques and helped students perform conceptual planning before coding begins.
- Lead Writing Consultant** Northfield, MN
 • *Carleton College Writing Center* *Sep. 2012–Jun. 2014*
 - Tutored undergraduates in professional and academic writing across many disciplines.
 - Collaborated with English-as-a-second-language (ESL) students in focused one-to-one sessions across two years.
 - Co-trained 15+ new writing consultants as lead student consultant.
- Sexuality and Gender Activism Lead Facilitator** Northfield, MN
 • *Carleton College Student Organization* *Sep. 2012–Jun. 2014*
 - Planned and coordinated several 25-50 person public events.
 - Facilitated social justice work by providing planning resources to students and organizations.

Programming Skills

In academic settings and in industry. Italics indicate less than one month of experience.

- Languages: Java, Python, R, C, Objective C, Scheme, Bash, SQL, JavaScript, *Visual Basic, Perl, Awk, x86 Assembly, C++, Clojure, C#, Lua, Groovy*
- Frameworks: PyTorch, SciPy stack, Pandas, scikit-learn, Hadoop MapReduce, Spark, SpaCy, *fast.ai, NLTK, gensim*
- Tools: Maven, Git, Mercurial, Vim, various Java and Python IDEs, Jupyter, \LaTeX , SQLite, *MongoDB, Redis, Ant, CVS, Valgrind, Xcode*
- Operating Systems: Ubuntu, Fedora, RHEL, Windows, Mac OS X
- GitHub: <https://github.com/levon003/>

Other Materials

- I designed a workshop on NLP methods for Social Computing/HCI researchers: <https://z.umn.edu/nlpForHci2019>
- I gave a guest lecture on my research in an undergraduate NLP class at Carleton College: <https://z.umn.edu/carletonNLP2019>
- My work with Hannah Miller Hillberg was cited in a news piece on The Verge: www.theverge.com/2019/2/18/18225231/emoji-emoticon-court-case-reference
- I wrote a few blog posts: <https://medium.com/@zwlevonian>
- References available on request.