

Zachary Levonian

Computer Science PhD
zwlevonian@gmail.com

Minneapolis, MN, USA
+1 (608) 780 9028
<https://z.umn.edu/zlevonian>

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

Education

- **PhD in Computer Science** Minneapolis, MN
University of Minnesota *Sep. 2017–Sep. 2022*
 - Researched human-computer interaction (HCI) and social computing for health
 - Led quantitative and qualitative research teams
 - Advisors: Loren Terveen and Svetlana Yarosh
 - Coursework: HCI & UI Technology, Social Computing, Machine Learning, Social Network Analysis, Embodied Computing, Database Systems, Statistics & Regression
- **BA in Computer Science (*magna cum laude*)** Northfield, MN
Carleton College *Sep. 2010–Jun. 2014*
 - 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

- **CaringBridge** Eagan, MN (Online)
Data Scientist Intern *Jun. 2021–Aug. 2021*
 - Designed, implemented, and evaluated a recommendation system for health blogs.
 - Implemented first-in-org data and analysis pipelines for user search and follow data.
- **Amazon** Seattle, WA (Online)
Applied Scientist Intern *Sep. 2020–Dec. 2020*
 - Designed prototype interface for data annotation.
 - Conducted simulation study of active learning for interactive machine learning.
- **The MITRE Corporation** McLean, VA
Computer Scientist *Jan. 2015–Jul. 2017*
 - Designed and developed automatic speech recognition (ASR) safety interfaces 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.

- **General Dynamics Mission Systems**
Software Developer

Fairfax, VA
Oct. 2014–Jan. 2015

- Provided design, integration, and software development support for research & development team using geospatial and graph databases for multi-modal data.

Publications (Refereed Conference and Journal)

- **Z. Levonian**, M. Harper, C.-J. Lee, V. Murdock, “Trade-offs in Sampling and Search for Early-stage Interactive Text Classification,” accepted to the *27th Annual Conference on Intelligent User Interfaces (IUI)*, 2022. z.umn.edu/tradeoffs2022
 - Quantitative simulations of small-sample interactive machine learning.
 - Methods: ML classification, active learning, full-text search, NLP transformer models
- **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,” *23rd ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*, 2021. z.umn.edu/connection2020
 - Quantitative social network analysis of an online health community.
 - Methods: regression, ML classification, social network analysis, content analysis
- **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.
- 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,” *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,” *Computer Supported Cooperative Work (CSCW)*, 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,” *Air Traffic Management Research and Development Seminar 2017 (ATM)*, 2017.
 - 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,” *IEEE/AIAA 34th Digital Avionics Systems Conference (DASC)*, 2015.
 - Computed quantitative automatic speech recognition (ASR) results.

- (In submission) **Z. Levonian**, M. Zent, N. Nguyen, M. McNamara, L. Terveen, S. Yarosh, “‘Some other poor soul’s problems’: a peer recommendation intervention for health-related social support,” under review, 2022. arxiv.org/abs/2209.04973
 - Designed, implemented, and evaluated a recommender system for health blogs.
- (In submission) C.E. Smith, **Z. Levonian**, H. Miller Hillberg, “‘Thoughts & Prayers’ or ‘❤️ & 🙏’: How the Release of New Reactions on CaringBridge Reshapes Supportive Communication in Health Crises,” under review, 2022.
 - Designed a user survey & conducted semi-structured interviews.

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.
 - **Outstanding Poster Recognition – CSCW 2020** (Top 5% of accepted posters)
 - 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 in the *21st ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW)*, 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–Aug. 2022*
 - Mentored **21** undergraduate and Master’s students, with student work presented in 2 full conference papers, 3 conference posters, 2 BA honors theses, and 1 MS thesis.
 - 2020 CRA Outstanding Undergraduate Researcher Awards: Honorable Mention for my student Drew Erikson. (Honors thesis: topic modeling for health communities)
 - Mentor for UMN Human-Centered Computing REU 2021 and Big Data REU 2019.
 - Mentored topics include: quantitative modeling, topic modeling, propensity score matching, embedding models, survival analysis, data science, visualization.

- **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 new unit and problem set on relational databases & SQL.
 - 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 material.

Research Funding & Awards

- **Doctoral Dissertation Fellowship** Minneapolis, MN
University of Minnesota *Sep. 2021–May 2022*
 - 1-year University-level dissertation fellowship to study peer recommendation systems.
- **Research Assistant** Minneapolis, MN
University of Minnesota CS Department *Sep. 2017–May 2021*
 - Researching social support, online communities, classification methods, recommendation systems, 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 (B.A. capstone)** Northfield, MN
Carleton College CS Department *Sep. 2013–Mar. 2014*
 - Distinction (top 40%) awarded by reviewing faculty of the CS department.
 - Designed an integrated development environment (IDE) to introduce basic developer tools for students learning Python on six-person development team.

Service & Other Experience

- **Graduate Research and Discussion Seminar Co-facilitator** Minneapolis, MN
University of Minnesota *Jan. 2019–Apr. 2020*
 - Organized biweekly seminar discussion for graduate Computer Science researchers.
- **Reviewer**
SIGCHI Conferences *Jan. 2019–Present*
 - Reviewed for ICWSM {2019, 2020, 2021, 2022}, CSCW {2020, 2021, 2022}, WWW {2021, 2022}, CHI 2022.
- **GroupLens Seminar Co-facilitator**
University of Minnesota CS Department *Jan. 2020–Apr. 2021*
 - Recruited external speakers and organized research discussions for GroupLens.

- **Undergraduate REU Researcher** Bozeman, MT
Montana State University CS Department *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.
- **Lead Writing Consultant** Northfield, MN
Carleton College Writing Center *Sep. 2012–Jun. 2014*
 – Tutored undergraduates in professional and academic writing across many disciplines.
- **Sexuality and Gender Activism Lead Facilitator** Northfield, MN
Carleton College Student Organization *Sep. 2012–Jun. 2014*
 – 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, React, AWS (S3, EC2), HuggingFace Transformers, Dash, *fast.ai, NLTK, gensim, node.js, Lucene/Solr*
- Tools: Maven, Git, Mercurial, Vim, various Java and Python IDEs, Jupyter, \LaTeX , SQLite, MySQL, Vowpal Wabbit, *MongoDB, Redis, Ant, CVS, Valgrind, Xcode*
- Operating Systems: Ubuntu, Fedora, Red Hat Enterprise Linux, Windows, Mac OS X
- GitHub: <https://github.com/levon003/>

Other Materials

- I wrote a few blog posts: <https://zwlevonian.medium.com>
- I gave talks at conferences (CSCW, ICWSM, IUI), at companies (Amazon, CaringBridge, MITRE), and at graduate seminars.
- I developed an ML auditing interface for Wikipedia editors:
<https://z.umn.edu/oresInspect>
- I designed a workshop on text classification for undergraduate HCI researchers:
<https://z.umn.edu/classificationForHci2021>
- 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