

# Keith Harrigian

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## Education

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| Aug. 2019 – Present   | <b>Johns Hopkins University</b><br>PhD, Computer Science.   |
| Aug. 2019 – Dec. 2021 | <b>Johns Hopkins University</b><br>Master of Science in Engineering, Computer Science. GPA: 4.0/4.0 |
| Sept. 2013 – May 2017 | <b>Northeastern University</b><br>BS, Mathematics. Minors in Physics and Music. GPA: 3.9/4.0        |

## Academic Research

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| Aug. 2019 – Present   | <b>Center for Language and Speech Processing (CLSP)</b><br><i>Graduate Research Assistant / P.I. Mark Dredze</i> <ul style="list-style-type: none"><li>Develop health-oriented machine learning models that are robust across multiple environments (e.g. data platform, demographic composition, hospital system)</li><li>Design and deploy a web-based analytics dashboard for summarizing patient electronic communication data to aid in treatment of adolescent and adult mood disorders</li></ul> |
| Aug. 2014 – Aug. 2019 | <b>The Action Lab</b><br><i>Research Assistant / P.I. Dagmar Sternad</i> <ul style="list-style-type: none"><li>Engineered a new algorithm using Hidden Markov Models to precisely detect initiation of finger taps in noisy strain gauge time series data</li><li>Co-supervised “Pitchers and Pianists” study at Boston Museum of Science from September 2015 through May 2016; educated 400+ visitors on human coordination and neural control</li></ul>   |

## Industry Experience

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| Mar. 2021 – Present   | <b>Unforged</b><br><i>Data Science and Machine Learning</i> <ul style="list-style-type: none"><li>Lead design and implementation of backend computing, data science, and machine learning infrastructure (e.g., personalization, content moderation)</li><li>Review grant applications to ensure technical contributions are accurately described; identify overlap in core technology with competitors to ensure contributions are novel</li><li>Oversee international data compliance efforts</li></ul>   |
| June 2018 – June 2019 | <b>Warner Media Applied Analytics</b><br><i>Senior Quantitative Analyst</i> <ul style="list-style-type: none"><li>Developed speech and language feature-extraction tools to model the relationship between thematic content in movie trailers and downstream effects on Wikipedia web traffic</li></ul><br><i>Quantitative Analyst</i> <ul style="list-style-type: none"><li>Optimized the targeting of interest segments on Facebook in real time using contextual-bandits and factorization of audience overlap matrices</li><li>Advised Masters student on a project to identify film mentions in podcast audio via fuzzy matching and supervised learning, resulting in publication</li></ul> |
| June 2017 – June 2018 | <b>Legendary Entertainment</b><br><i>Quantitative Analyst</i> <ul style="list-style-type: none"><li>Developed a multi-modal model to infer demographics of Reddit users and a collaborative filtering system to segment online communities</li><li>Programmed an interactive tool to extract book titles mentioned on Reddit, scrape metadata from an online reading database, and visualize demographic-level trends</li><li>Leveraged partial least squares regression to create a content- and marketplace-aware arbitrage model for the digital promotion of news articles</li></ul>  |

July 2016 – Dec. 2016	<b>True Fit Corporation</b> <i>Scientist (Co-op)</i> <ul style="list-style-type: none"> <li>Designed a robust anomaly detection system to capture fraudulent retail transactions, reducing noise by 10% in recommendation engine training data</li> <li>Modeled e-commerce return rates to establish baselines for A/B testing</li> </ul>
July 2015 – July 2016	<b>Legendary Entertainment</b> <i>Quantitative Research Collaborator (Consultant)</i> <ul style="list-style-type: none"> <li>Led R&amp;D of a conditional random field model for end-to-end named entity recognition on Twitter, allowing for dynamic query filtering based on temporal popularity fluctuations</li> </ul> <i>Quantitative Research Analyst (Co-op)</i> <ul style="list-style-type: none"> <li>Created a command-line tool to acquire secondary market sales data and compile revenue reports, enabling 4 professional sports organizations to optimize ticket prices</li> <li>Trained Naïve Bayes model to quantify movie-going intent and infer sentiment within tweets</li> </ul>

## Publications

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**Harrigian, K.** & Dredze, M. “Then and Now: Quantifying the Longitudinal Validity of Self-disclosed Depression Diagnoses.” *In Proceedings of the Computational Linguistics and Clinical Psychology Workshop (NAACL)*. 2022.

**Harrigian, K.** & Dredze, M. “The Problem of Semantic Shift in Longitudinal Monitoring of Social Media.” *In Proceedings of the 14<sup>th</sup> ACM Web Science Conference*. 2022.

**Harrigian, K.**, Aguirre, C., & Dredze, M. “On the State of Social Media Data for Mental Health Research.” *In Proceedings of the Computational Linguistics and Clinical Psychology Workshop (NAACL)*. 2021.

Sherman, E., **Harrigian, K.**, Aguirre, C., & Dredze, M. “Towards Understanding the Role of Demographics in Deploying Social Media-Based Mental Health Surveillance Models.” *In Proceedings of the Computational Linguistics and Clinical Psychology Workshop (NAACL)*. 2021.

Aguirre, C., **Harrigian, K.**, & Dredze, M. “Gender and Racial Fairness in Depression Research using Social Media.” *In Proceedings of the 16<sup>th</sup> Conference of the European Chapter of the ACL (EACL)*. 2021.

**Harrigian, K.**, Aguirre, C., & Dredze, M. “Do Models of Mental Health Based on Social Media Generalize?” *In Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP): Findings*. 2020.

**Harrigian, K.**, Guo, D., Park, S., & Sternad, D. “Pitchers and Pianists: A Large-scale Study on Discrete and Rhythmic Timing.” *In Preparation*.

**Harrigian, K.** “Geocoding Without Geotags: A Text-based Approach for reddit.” *In Proceedings of the 4<sup>th</sup> Workshop on Noisy User-generated Text (EMNLP)*. 2018.

Gundogdu, A., Sanghvi, A., & **Harrigian, K.** “Recognizing Film Entities in Podcasts.” *In Proceedings of the 1<sup>st</sup> Workshop on Machine Learning and Data Mining for Podcasts (KDD)*. 2018.

## Posters and Talks

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Sternad, D., Guo, D., & **Harrigian, K.** “Pitchers and Pianists: Timing in Discrete and Rhythmic Motor Skills.” *New England Sequencing and Timing Meeting*. 2017.

**Harrigian, K.**, Sanders, N., Foster, J., & Sanghvi, A. “When Anonymity is Not Anonymous: Gender Inference on Reddit.” Won Outstanding Student Research (Computer and Information Sciences). *Northeastern Research, Innovation, and Scholarship Expo*. 2016.

**Harrigian, K.**, Kuznetsov, N., Sternad, D. “Effects of tDCS on Precision of Finger Force Control and Rhythmic Tapping Movements.” *Northeastern Research, Innovation, and Scholarship Expo*. 2015.

## Honors and Awards

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Oct. 2016                      *Marshall Fellowship Finalist*  
Nominated by faculty for outstanding academic merit and ambassadorial ability

Oct. 2016                      *Rhodes Fellowship Nominee*  
Nominated by faculty for scholarly merit, social commitment, and leadership

Apr. 2016	<i>Outstanding Student Research (Computer and Information Sciences)</i> Best undergraduate poster in Computer and Information Science at Northeastern RISE 2016
Dec. 2015	<i>Barry Goldwater Scholarship Nominee</i> Research Proposal: Extreme Learning Machine for Localization of EEG in Parkinson's Patients

## Grants

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Apr. 2015	<i>Undergraduate Research and Creative Endeavors Award</i> \$1000 to research effect of metric structure strength on motor learning of temporal rhythms
Apr. 2014	<i>Lawrence Award for Undergraduate Scholastic Excellence in Physics</i> \$250 scholarship awarded to student(s) with the highest GPA in class year
Sept. 2013	<i>Northeastern College of Science Dean's Scholarship</i> \$80,000 scholarship awarded to top incoming undergraduates

## Academic Service

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Aug. 2019 – June 2020	<b>Northeastern Honors Program</b> <i>Alumni Advisor</i> <ul style="list-style-type: none"> <li>Provide career and course guidance to two Northeastern University computer science undergraduate students</li> </ul>
Sept. 2015 – May 2017	<b>Northeastern College of Science</b> <i>Peer Advising Coach and Ambassador</i> <ul style="list-style-type: none"> <li>Met weekly with a first-year physics undergraduate student to instill successful academic habits; curated a study schedule to address time-management issues</li> </ul>
Sept. 2013 – Jan. 2016	<b>Northeastern Student Government Association</b> <i>Chair of Elections</i> <ul style="list-style-type: none"> <li>Raised voter turnout by 25% to a record high for campus of 18,000 undergraduates</li> <li>Reformed referendum process by increasing accountability and transparency of legislature</li> </ul>

## Community Service

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Apr. 2014 – Apr. 2018	<b>Boston Athletic Association</b> <i>Team Captain (Recycling)</i> <ul style="list-style-type: none"> <li>Led recycling operations for the Boston Marathon Finish Area</li> <li>Supervised team of 40+ volunteers in collection of recyclable goods and trash</li> </ul>
Jan. 2009 – Aug. 2014	<b>Golden Retriever Club of Greater Los Angeles Rescue</b> <i>Volunteer and Foster</i> <ul style="list-style-type: none"> <li>Served as caretaker for over 40 dogs; assisted in their transportation to medical appointments</li> <li>Expedited revenue collection at several fundraisers via PayPal</li> </ul>

## Reviewing Service

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Journals	Journal of Medical Internet Research (JMIR)
Conferences	Computational Linguistics and Clinical Psychology Workshop (CLPsych); International Conference on Linguistics (COLING)

## Teaching

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Spring 2021	<b>Deep Learning.</b> Johns Hopkins University. Teaching Assistant. Graduate and Undergraduate.
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## Advising

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Mar. 2022 – Present	<b>Hyun Joo Rosalyn Shin.</b> Johns Hopkins University. Masters Student.
Apr. 2020 – Jan. 2021	<b>Narayani Wagle.</b> Johns Hopkins University. Undergraduate Student.

Jan. 2019 – June 2019	<b>Aniruddah Tapas.</b> Warner Media Applied Analytics. Co-op Student.
Oct. 2018 – Dec. 2018	<b>Ryan Oakley.</b> Warner Media Applied Analytics. Co-op Student.
Jan. 2018 – June 2018	<b>Ahmet Gundogdu.</b> Warner Media Applied Analytics. Co-op Student.

## Technical Skills

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Programming Languages	Python (Advanced), SQL (Intermediate), R (Functional), Stan (Functional), MATLAB (Functional), C (Functional)
Miscellaneous	Git (Intermediate), Bash (Intermediate), AWS (Functional)
Certifications	National Institutes of Health Office of Extramural Research (Human Subjects)