Chelsea Chandler

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Education

University of Colorado Boulder 2017 - Present
Ph.D. Student in Computer Science and Cognitive Science **GPA**: 3.9
Advisors: James H. Martin and Peter W. Foltz
M.S. in Computer Science completed May 2020
Selected Coursework:
Data Mining, Natural Language Processing, Chaotic Dynamics, Machine Learning, Computational Lexical Semantics, Morphology and Syntax (Linguistics), Algorithms, Neural Networks and Deep Learning, Object Oriented Analysis and Design, User-Centered Design, Language Seminar

University of Virginia 2012 - 2016
Bachelor of Arts in Mathematics and Computer Science **GPA** (CS): 4.0

Research Interests

Natural Language Processing, Machine Learning, Cognitive Science, Mental Health

Publications

Peer Reviewed Journal and Conference Papers

- **Chandler, C.**, Holmlund, T.B., Foltz, P.W., Cohen, A.S., and Elvevåg, B. (2021). Extending the usefulness of the verbal memory test: The promise of machine learning. *Psychiatry Research*.
- **Chandler, C.**, Foltz, P.W., Cohen, A.S., Holmlund, T.B., Cheng, J., Bernstein, J.C., Rosenfeld, E.P., and Elvevåg, B. (2020). Machine learning for ambulatory applications of neuropsychological testing. *Intelligence-Based Medicine*, Volumes 12, 100006.
- **Chandler, C.**, Foltz, P.W., Cheng, J., Cohen, A.S., Holmlund, T.B., and Elvevåg, B. (2020). Predicting Self-Reported Affect from Speech Acoustics and Language. In Proceedings of the *LREC 2020 Workshop on: Resources and Processing of Linguistic, Para-linguistic and Extra-linguistic Data from People with Various Forms of Cognitive/Psychiatric/Developmental Impairments (RaPID-3)*. pp. 9-14.
- **Chandler, C.**, Foltz, P.W., and Elvevåg, B. (2020). Using Machine Learning in Psychiatry: The Need to Establish a Framework That Nurtures Trustworthiness. *Schizophrenia Bulletin*. Volume 46, Issue 1, pp. 1114.
- Holmlund, T.B., **Chandler, C.**, Foltz, P.W., Cohen, A.S., D., Cheng, J., Bernstein, J., Rosenfeld, E., and Elvevåg, B. (2020). Applying speech technologies to assess verbal memory in patients with serious mental illness. *npj Digital Medicine* 3 (1), 1-8.
- **Chandler, C.**, Foltz, P.W., Cheng, J., Bernstein, J.C., Rosenfeld, E.P., Cohen, A.S, Holmlund, T.B. and Elvevåg, B. (2019). Overcoming the bottleneck in traditional assessments of verbal memory: Modeling human ratings and classifying clinical group membership. In Proceedings of the *NAACL-HLT 2019 Workshop on Computational Linguistics and Clinical Psychology*. pp. 137-147.

Works in Progress

- Diaz-Asper, C., **Chandler, C.**, Turner, S.R., Reynolds, B., and Elvevåg, B. (Submitted). Feasibility of assessing cognitive state in the elderly from speech collected via the telephone. *Digital Health*.

Funding and Awards

- Nelson A. Prager Family and James H. Martin Endowed Graduate Fellowship (2020)
- CU Boulder Summer Research Fellowship for an outstanding Ph.D. TA (2019)
- Travel grant to attend the CRA-W Grad Cohort Workshop for Women (2018 and 2019)
- Institute of Pure and Applied Mathematics travel grant to present research at Joint Mathematics Meeting in Seattle, WA (2016)
- University of Virginia travel grant to attend Grace Hopper Celebration of Women in Computing (2016)
- University of Virginia Dean's List (2014-2016)

Work History

Consultant

Computational Psychiatry April 2019 - Present

- Developed a pipeline to extract Natural Language Processing features from psychiatric speech data
- Implemented machine learning models based on language features to characterize Mild Cognitive Impairment and Alzheimer's Disease

Educational AI June 2020 - Present

- Extracted BERT sentence embeddings of student speech transcripts for use in an AI tutoring system
- Fine-tuned a pre-trained BERT model for use in a novel AI tutoring system

University of Colorado Boulder

Teaching Assistant August 2017 - Present

- Introduction to Computing (Fall 2017 and Spring 2018), Software Development Methods and Tools (Fall 2018, Spring 2019, and Spring 2020), Graduate Natural Language Processing (Fall 2019), and Senior Capstone Project (Fall 2020, Spring 2021)

Research Assistant Fall 2019

- Built an API for generating word embedding similarity measures between pieces of text using Python
- Input text was preprocessed, converted to LSA or Word2Vec embeddings, and cosine distances between various segments of the text were generated
- Developed the final user facing website using HTML and JavaScript

Research Assistant Summer 2018 & 2019

- Collected immediate and delayed verbal recalls to short stories from mentally ill and presumed healthy study participants
- Extracted surface level and semantic features from verbal recalls to build machine learning models for predicting human ratings of recall content and classifying participants as mentally ill or healthy
- Modeled speech and language features to predict self-reports of emotion

Lockheed Martin December 2016 - March 2019

Software Engineer

- Developed an API for running Markov Chain Monte Carlo (MCMC) simulations on financial data using the Python library PyMC3
- Created an AngularJS application for demonstrating the MCMC simulations
- Produced visualizations in Tableau for analyzing financial data and results of MCMC simulations
- Developed a program to assist in the discrete embedding of data in PNG files using Python and Perl
- Researched and reported advanced techniques for detecting malicious JavaScript code

C2 Education August 2016 - July 2017

Tutor

- Worked with students in a 3:1 setting to improve their math and computer science skills and prepare for standardized tests and college

Center for Open Science August 2015 - June 2016

Developer Intern

- Conducted research on Elasticsearch database optimizations for the Open Science Framework (OSF)
- Created widgets using Elasticsearch query results and the JavaScript graphing libraries C3 and D3
- Harvested metadata from published research to include in the SHARE data set

Research in Industrial Projects for Students (Sponsor: Google LA) June 2015 - August 2015

Student Researcher and Project Manager

- Developed collaborative filtering models based on the Yelp Challenge Dataset for rating predictions which incorporated matrix factorization, natural language processing, topic modeling, and geographic location
- Presented project findings at the Institute for Pure and Applied Mathematics at UCLA, Google, and the 2016 Joint Mathematics Meetings

Service

- Reviewer for *Schizophrenia Bulletin* and *Psychiatry Research*
- Ph.D. Student Faculty Search Committee
- CU Boulder Graduate School Peer Mentor
- CU Boulder Computer Science Peer Mentor

Presentations

- Overcoming the bottleneck in traditional assessments of verbal memory: Modeling human ratings and classifying clinical group membership at the Sixth Workshop on Computational Linguistics and Clinical Psychology, NAACL-HLT. June 2019.
- Overcoming the bottleneck in traditional assessments of mental health at Colorado Clinical and Translational Sciences Institute CU-CSU Summit. August 2019.
- Machine Learning and Natural Language Processing Approaches to the Automated Assessment of Mental Illness at Computing Research Association Grad Cohort for Women (CRA-W). April 2019 and April 2018.
- Personalized Local Recommendations at Joint Mathematics Meetings. January 2016.