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Ian Stewart

Graduate student in social computing.

801 Atlantic Drive NW
Atlanta, GA 30318
H *978.317.9624*
B *istewart6@gatech.edu*
ianbstewart.github.io

I study social phenomena in online environments, using language as a metric for variation and change. My work leverages sociolinguistics to make the most out of natural language processing.

Education

2015–present **Georgia Institute of Technology**, *Ph.D. in Human-Centered Computing*.
Specialization in social computing.
Research interests: natural language processing, Internet sociolinguistics, language variation and change over time.
Advised by Jacob Eisenstein.

2010–2014 **Dartmouth College**, *A.B. Linguistics (cum laude), minor in Computer Science*.
GPA: 3.78 (cum.) 3.90 (major)
Thesis: "African American English syntax in Twitter."
Advised by James Stanford and Sravana Reddy.

Awards

August 2015 **Great Promise Award**, Charles River Analytics.
Awarded to an intern in each company division who shows significant promise as a researcher. Determined by manager's review and a final presentation.

May 2014 **Academic Achievement Award**, Dartmouth College Linguistics Department.
Awarded to a graduating student who has demonstrated considerable commitment to research in linguistics.

May 2014 **English Teaching Assistantship**, Fulbright U.S. Student Program.
Highly competitive English teaching position in South Korea. Declined in favor of other employment.

August 2012 **Presidential Scholar**, Dartmouth College.
Awarded to exceptional undergraduate researchers to fund independent projects in their major, under a professor's advising.

Skills

Programming languages: Java (proficient), Python (proficient), R (intermediate), LaTeX(intermediate)

Programming libraries: sklearn, statsmodels, gensim, Weka, nltk, Beautiful Soup, Gephi, matplotlib, pandas

Natural languages: English (native), French (fluent), Japanese (intermediate), Spanish (beginner), Māori (beginner)

Research

Aug 2015 – present **Graduate Research Assistant**, Georgia Tech Computational Linguistics Lab.
- Testing edit distance metrics, such as probabilistic finite state transduction, and their application to orthographic (spelling) variation.
- Modeling the difference between individual and community-level language variation over time, e.g. if an individual's language diverges from the community's language.
- Research conducted on an Instagram corpus using Python for analysis (logistic regression) and visualization (time series).
- Publication in submission.

Dec 2013 – June 2014 **Undergraduate Research Assistant**, Dartmouth College Linguistics Department.
- Designed regular expressions to extract non-standard sentence patterns (syntax) characteristic of African American English (AAE) in Twitter data, using a combination of words and part-of-speech tags.
- Determined correlation between AAE and community-level demographics with linear and logistic

Jan 2012 – Aug 2012 **Undergraduate Research Assistant**, Dartmouth College Linguistics Department.
- Extended and enhanced computational model of interaction-based language change with agent-based modeling (in Java Swarm).
- Simulated dialect contact situation to predict change in a language in rural China (Sui), using field data as ground-truth.
- Developed evidence in favor of peer-based, as opposed to family-based, dialect acquisition.
- Presented results at NWAV-PACIFIC 2012 in Tachikawa, Japan.
- Funded by a Dartmouth Presidential Scholarship.

Work

May 2016 – Aug 2016 **PhD Intern**, Pacific Northwest National Laboratory.
- PhD intern through the National Security Internship Program.
- Formulated and tested methods to predict word dynamics over time in social media data.
- Implemented unsupervised clustering and smoothing in Python (sklearn) to group semantically related words.
- Corroborated connection between distributional semantic meaning (measured with word2vec) and frequency dynamics.

Aug 2015 – Dec 2015 **Graduate Teaching Assistant**, Georgia Tech.
- Designed homework assignments that required implementation of AI algorithms in iPython notebooks.
- Prepared documentation for assignments to help transition the class to an online platform.

June 2014 – Aug 2015 **Software Engineer Intern**, Charles River Analytics.
- Contributed to agent-based social network generation model (in AnyLogic and Java MASON), in collaboration with two scientists.
- Designed pipeline for social network synthesis and analysis, implementing metrics such as the network clustering coefficient and community modularity.
- Extracted parameters from large-scale social media data for network generation model, such as distribution of languages across Twitter users.

Sep 2013 – Mar 2014 **Linguistics Tutor**, Dartmouth College.
- Assisted students in introductory linguistics and history of English.
- Reviewed practice problems to reinforce understanding of course material, such as vowel shifts.

Coursework

- Social Computing
- Design of Online Communities
- Dialectology
- Introduction to Sociolinguistics
- Field Methods in Linguistics
- Natural Language Understanding
- Statistical Methods
- Machine Readings
- Problem Solving in Computer Science
- Discrete Mathematics

Presentations and posters

2015 E. Stickgold, B. Skarin, I. Stewart, C. Lofdahl. "Extending generative models of large scale networks." 24th Conference on Behavior Representation in Modeling and Simulation (BRiMS). Washington, D.C.

2015 I. Stewart. "We some young kings: Communities, age, and African American English online." 2015 Annual Meeting of the American Dialect Society. Portland, Oregon.

2014 I. Stewart. "Now we stronger than ever: African American syntax on Twitter." 14th Conference of the European Chapter of the Association for Computational Linguistics.

2012 J. Stanford and I. Stewart. "The question of density: Multi-agent modeling of field data in Sui exogamous villages." New Ways of Analyzing Variation and Change in the Asia-Pacific Region (NWAV ASIA-PACIFIC 2).

Interests

- Music making
- Language learning
- Cookie baking
- Letter kerning