Aaron M. Mueller

CONTACT INFORMATION	Center for Language & Speech Processing Johns Hopkins University 3400 N. Charles St., Hackerman 319 Baltimore, MD 21218-2608 (U.S.A.)	*E-mail:* amueller@jhu.edu *Website:* aaronmueller.github.io

RESEARCH INTERESTS

- Computational psycholinguistics
- Social media analysis (sociolinguistics)
- Endangered and low-resource language varieties
- Machine translation

EDUCATION

Johns Hopkins University, Baltimore, MD

Ph.D. student, Computer Science. — August 2018 - Present
M.S.E., Computer Science. — Expected May 2020
Affiliation: Center for Language and Speech Processing.
Advisor: David Yarowsky.

University of Kentucky, Lexington, KY

B.S., Computer Science. Honors. — May 2018
B.S., Linguistics. Honors. — May 2018
GPA: 4.0. *Summa cum laude*.
Thesis: Neural Machine Translation for Canadian French.
Advisors: Ramakanth Kavuluru, Mark Richard Lauersdorf.

RESEARCH EMPLOYMENT

BBN Technologies, Cambridge, MA
Analytics & Machine Intelligence
Speech, Language, & Multimedia Research Intern — May - August 2019
Supervisors: Roger Bock, Ilana Heintz

- Research in neural machine translation, word alignment, and entity linking.
- Funded by DARPA's Active Interpretation of Disparate Alternatives (AIDA) program.

University of Kentucky, Lexington, KY
Institutional Research & Advanced Analytics
Research Assistant (Machine Learning) — May - August 2018
Supervisors: Nathan Jacobs, Craig Rudick

- Designed a system that, given a student's prior performance, predicts their future course grades.
- Implemented deep LSTMs and employed NLP techniques to learn student and course profiles.
- Designed an ordinal grade-based loss function to improve system performance.

University of Massachusetts Amherst, Amherst, MA
Statistical Social Language Analysis Lab
Research Assistant (Natural Language Processing) — May - August 2017
Supervisor: Brendan O'Connor

- Collaborated with graduate students and faculty to improve an entity-event extraction system.
- Given news articles, used distant supervision to extract the names of American citizens who have been killed by police.
- Integrated entity mention and relation systems into pre-existing sentence-level model.
- Integrated document-level information (e.g., noun coreferences) as features to improve our system.

University of Kentucky, Lexington, KY
Linguistics Department
Juried Project — August 2016 - May 2017
Jurors: Hilaria Cruz, Raphael Finkel, Phil Harling

- Preservation and revitalization project for a low-resource indigenous language—Chatino—spoken natively by approximately 40,000 individuals.
- Trained an automatic speech recognition system with Sphinx.

– Promoted and created Chatino language-learning resources, including open-source speech data, a speech corpus, and a website.

Johns Hopkins University, Baltimore, MD
Center for Language & Speech Processing
Research Assistant (Natural Language Processing)   May - August 2016
Supervisor: David Yarowsky
– Collaborated with graduate students and faculty to create statistical machine translation systems for low-resource languages.
– Implemented a lemma-based English-Uyghur translation model, built a morphological generator for Crimean Tatar, and created parsers to extract translation tables from foreign editions of Wiktionary.
– Funded by DARPA's Low-Resource Languages for Emergent Incidents (LORELEI) program.

FELLOWSHIPS AND AWARDS

National Science Foundation Graduate Research Fellow   2018 - 2023

Gaines Fellow   2016 - 2018
Two-year fellowship awarded to undergraduates based on academic performance, ability to conduct research, an interest in public issues, and a desire to enhance understanding of the human condition through the humanities. Requires the completion of a juried project, a thesis project, and a seminar in the humanities. ($5,000)

Patterson Scholar   2014 - 2018
Awarded to University of Kentucky students who have earned National Merit scholarships. ($80,000+)

Raymond F. Betts Scholar   2017
Awarded to rising seniors conducting thesis research. Used funds to study Québec French in Montréal and Québec City during winter of 2017–2018. ($2,500)

Goldwater Scholarship (Honorable Mention)   2017

Phi Beta Kappa   2017

Linguistics Research Award   2016
Awarded to a University of Kentucky undergraduate to facilitate a year-long research project in linguistics. Used funds for a quantitative sociolinguistics project examining semantic shifts in gendered words in U.S. media over 200 years. ($500)

National Merit Scholar   2014

PUBLICATIONS

1. Arya D. McCarthy, Winston Wu, **Aaron Mueller**, Bill Watson, and David Yarowsky. *Modeling Color Terminology Across Thousands of Languages.* To appear at Empirical Methods in Natural Language Processing (EMNLP), 2019.
2. Marten van Schijndel, **Aaron Mueller**, and Tal Linzen. *Quantity Doesn't Buy Quality Syntax with Neural Language Models.* To appear at Empirical Methods in Natural Language Processing (EMNLP), 2019.
3. **Aaron Mueller*** and Yash Kumar Lal*. *Sentence-Level Adaptation for Low-Resource Neural Machine Translation.* Machine Translation Summit (MTSummit) Workshop on Technologies for Machine Translation of Low-Resource Languages (LoResMT), 2019. **[*Equal contribution]**

SELECTED PRESENTATIONS

Aaron Mueller. *Québec French and Language Technology.* 2018 Betts & Rowland Scholar Awards Ceremony, Lexington, KY, April 4, 2018.

Aaron Mueller, Katherine Keith, Abram Handler, Su Lin Blodgett, and Brendan O'Connor. *The Identification of Civilians Killed by Police with Supervised Entity-Event Extraction.* 2017 UMass Amherst Research Experience for Undergraduates (REU) Showcase, Amherst, MA, August 9, 2017.

Aaron Mueller, Raphael Finkel, and Hilaria Cruz. *Documenting and Promoting the Chatino Language and Orthography.* Juried Presentation in Satisfaction of the Requirements of the Gaines Fellowship, Lexington, KY, February 21, 2017.

Aaron Mueller, Huda Khayrallah, Winston Wu, and David Yarowsky. *A Lemma-Based Approach for English-Uyghur Statistical Machine Translation.* 9th Annual Conference of the Illinois Language and Linguistics Society (ILLS9), Urbana, IL, March 31–April 1, 2017.

Aaron Mueller and Mark Richard Lauersdorf. *Lexical and Semantic Shifts in the Linguistic Construction of Social Gender: A Corpus-Based Analysis of Written U.S. English.* Poster. 9th Annual Toronto Undergraduate Linguistics Conference (TULCON9), Toronto, ON, March 4–6, 2016.

ADDITIONAL
EXPERIENCE

Chellgren Center for Undergraduate Excellence, Lexington, KY
Student Outreach Team   August 2017 - May 2018
– Promoted the Office of Undergraduate Research and the Chellgren Fellowship.
– Organized panel discussions, workshops, and lectures on abstract writing, research poster design, and academic presentations.
– Led the review committee for our Showcase of Undergraduate Scholars, an annual conference where University of Kentucky undergraduates present their research to other students and faculty.

UK Special Collections Research Center, Lexington, KY
Archiving Intern   September 2015 - May 2016
– Created a diachronic corpus of Lexingtonian architectural documentation which includes zoning ordinances and Lexington Planning Committee meeting minutes.
– Made accessible an archival collection that highlights Lexington's architectural history.
– Cooperated on a multiformat project that layered GIS technology, city government data, archival photos, and digital humanities tools.

VOLUNTEER
SERVICE

Amnesty International   2012 - Present
– International organization dedicated to the protection of human rights worldwide.
– Member of Amnesty International at Johns Hopkins and Washington, D.C.
– *Founder* and former *Co-President* of Amnesty International at the University of Kentucky.
– Organize fundraisers and informational events: concerts featuring local bands, panel discussions on contemporary issues, faculty debates, petitions, protests, and more.
– Attendee at Amnesty's national Human Rights Conference.

Oxfam International   2014 - Present
– International organization dedicated to poverty eradication, disaster relief, and political advocacy for those facing harsh living conditions and injustice worldwide.
– Member of Oxfam in Washington, D.C.
– *Founder* and former *Co-Coordinator* of Oxfam at the University of Kentucky.
– Plan awareness-raising, fundraising, and petitioning events for Oxfam's GROW campaign with a distinct focus on food inequality in impoverished and war-stricken countries.

Society for the Promotion of Undergraduate Research   2014 - 2017
– University-of-Kentucky-based organization founded to assist undergraduates in finding research opportunities and in bettering their research.
– *Co-President* and former *Director of Events*.
– Plan and execute the Showcase of Undergraduate Scholars.
– Plan research workshops to help undergraduates improve their abstracts, presentations, and papers.
– Organize faculty panel discussions, promotional events, and information sessions on getting involved in undergraduate research and on scholarship and summer research opportunities.
– Merged with the Student Outreach Team in May 2017 (joined upon merge).

COMPUTING
SKILLS

Computer Programming:
– Languages: Python, C, C++, Java, HTML, CSS, Javascript, MATLAB, R, UNIX shell scripting.
– Machine Learning Toolkits: TensorFlow, Sockeye, Keras, PyTorch, OpenNMT.
– Version Control: DVCS (Git, Bitbucket).
– Development Environments: Vim, Emacs, Eclipse.

Linguistic Tools:
   Praat, AntConc, QGIS, Audacity.

Desktop Editing and Productivity Software:
- TEX (LATEX, BIBTEX).
- GIMP, Inkscape.
- Microsoft Office, G Suite, OpenOffice.org, LibreOffice

LANGUAGES   Fluent in English and French (Canadian). Rudimentary Inuktitut. Experience with Chatino and Uyghur through research.

INTERESTS AND
HOBBIES
- Music: guitar (classical, electric), bass, banjo, synthesizer, MaxMSP, Ableton Live.
- Athletics: cold-weather/snow hiking, swing dance, contra.
- Hobbies: natural language learning, reading (philosophy, politics), city exploration.
- Cooking: Thai, French, German, Southern.