# Alan E. Mishler

Department of Statistics & Data Science
Carnegie Mellon University
Pittsburgh, PA 15213

Email: amishler@stat.cmu.edu
Website: amishler.github.io
LinkedIn: www.linkedin.com/in/alanmishler

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## Research interests

Causal inference · Clustering · Unsupervised learning · Algorithmic fairness · Natural language processing/computational linguistics

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## Skills

**Statistical methods**: supervised and unsupervised learning (regression, classification, clustering), deep learning, hypothesis testing, repeated measures designs, hidden Markov models, network models

**Computational methods**: Natural language processing, topic modeling, feature engineering

**Languages**: Python (pandas, scikit-learn, matplotlib, keras, nltk), R, SQL, Java, C

**Natural Languages**: Japanese, Spanish, Portuguese

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## Education

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| Current | PhD student in Statistics & Data Science, Carnegie Mellon University (expected graduation: December, 2020) |
| 05/2017 | MS in Statistics, Carnegie Mellon University |
| 08/2016 | BS in Mathematics, University of Maryland |
| 04/2009 | BA in Linguistics, *summa cum laude*, minor in Japanese, University of Michigan |

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## Employment

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| 06/18–08/18 | **Data Science/Quantitative Analyst Intern**: Google. |
| | Building a machine learning pipeline to extract information from text for integration into various products. |
| 05/17–08/17 | **Graduate Data Science Intern**, **Business Analytics**: Box, Inc. |
| | Built a machine learning pipeline to automatically identify new marketing and sales leads. Designed, trained, and tested a variety of classifiers using a range of algorithms, feature sets, and performance metrics. Implemented the final classifier in production. |
| 09/10–08/16 | **Senior Faculty Research Specialist**: University of Maryland Center for Advanced Study of Language |
| | Designed, conducted, and analyzed experiments in areas such as topic modeling, signal detection, decision making, cognitive control, bilingualism, and speech perception. Presented |

research milestones and results to U.S. Government clients. First author on 10 technical reports to the U.S. Government.

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| 09/11–08/13 | **Consultant Phonetician**: SRI International |

Helped develop guidelines for the transcription of Japanese-accented English, toward the development of an automated pronunciation feedback system for native Japanese learners of English. Worked with four other phoneticians to build a transcription database of Japanese-accented English. Conducted phone alignment in Arabic for the development of Arabic speech recognition software.

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| 8/09–9/10 | **Post-Baccalaureate Research Fellow**: University of Maryland Department of Linguistics |

Worked on research on syntactic processing during reading and listening, using eye tracking and EEG.

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| 5/09–8/09 | Research Assistant, University of Michigan Department of Linguistics, Phonetics Lab |
| 5/06–9/06 | Research Assistant, University of Colorado Center for Spoken Language Research |

## Research

### Peer-reviewed publications

| | |
|---|---|
| 2017 | Erica B. Michael, Petra Bradley, **Alan Mishler**, Lelyn D. Saner, Brook Hefright, Ann Zeng, Joseph H. Danks. (2018). Human use of machine translation to extract information from texts. In Isabel Lacruz and Riitta Jääskeläinen (eds.), *Innovation and expansion in translation process research*, : 191–216. Amsterdam: John Benjamins Publishing Company. |
| 2017 | **Alan Mishler**, Kevin Wonus, Wendy Chambers, Michael Bloodgood. (2017). Filtering tweets for social unrest. *Proceedings of the 2017 IEEE 11th International Conference on Semantic Computing (ICSC)*. `10.1109/ICSC.2017.75`. |
| 2016 | Thomas Wallsten J. Isaiah Harbison. (2016). Modeling triage decision making. *Proceedings of the 38th Annual Conference of the Cognitive Science Society*. |
| 2016 | Erika K. Hussey, J. Isaiah Harbison, Susan E. Teubner-Rhodes, **Alan Mishler**, Kayla Velnoskey, Jared M. Novick. (2016). Memory and language improvements following cognitive control training. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. `https://dx.doi.org/10.1037/xlm0000283`. |
| 2016 | Susan Teubner-Rhodes, **Alan Mishler**, Ryan Corbett, Llorenc Andreu, Monica Sanz-Torrent, John Trueswell, Jared Novick. (2016). The bilingual advantage: conflict monitoring, cognitive control, and garden-path recovery. *Cognition* 150: 213–231. `http://dx.doi.org/10.1016/j.cognition.2016.02.011`. |
| 2013 | Brian Dillon, **Alan Mishler**, Shayne Sloggett, Colin Phillips. (2013). Contrasting interference profiles for agreement and anaphora: experimental and modeling evidence. *Journal of Memory and Language* 69(2): 85–103. `http://dx.doi.org/10.1016/j.jml.2013.04.003`. |
| 2012 | Charles Chang, **Alan Mishler**. (2012). Evidence for language transfer leading to a perceptual advantage for non-native listeners. *Journal of the Acoustical Society of America* 132(4): 2700–10. `http://dx.doi.org/10.1121/1.4747615`. |
| 2008 | **Alan Mishler**. (2008). The discourse of voicemail. *Hermes Journal of Linguistics* 40: 167–197. |

## Peer-reviewed presentations

2018    **Alan Mishler**, Rebecca Nugent. (2018). Clustering students and inferring skill set profiles with skill hierarchies. Poster presented at the *2018 Classification Society Annual Meeting.* Stony Brook, NY.

2018    **Alan Mishler**, Edward Kennedy. (2018). Counterfactual prediction and fairness in risk assessment tools. Poster presented at the *2018 Atlantic Causal Inference Conference.* Pittsburgh, PA.

2015    **Alan Mishler**, Erin Smith Crabb, Susannah Paletz, Brook Hefright, Ewa Golonka. (2015). Using structural topic modeling to detect events and cluster Twitter users in the Ukrainian crisis. Poster presented at the *17th International Conference on Human-Computer Interaction.* Los Angeles, CA.

2015    Erin Smith Crabb, **Alan Mishler**, Susannah Paletz, Brook Hefright, Ewa Golonka. (2015). Reading between the lines: A prototype model for detecting Twitter sockpuppet accounts using language-agnostic processes. Poster presented at the *17th International Conference on Human-Computer Interaction.* Los Angeles, CA.

2015    Erin Smith Crabb, **Alan Mishler**, Susannah Paletz, Brook Hefright, Ewa Golonka. (2015). Detecting and clustering sockpuppets in Ukrainian social media: Two computational linguistic proof-of-concepts. Talk given at the *2015 INGRoup [Interdisciplinary Network for Group Research] Conference.* Pittsburgh, PA.

2013    Erika Hussey, Isaiah Harbison, **Alan Mishler**, Susan Teubner-Rhodes, Kayla Velnoskey, Jared Novick. (2013). Memory and language improvements following cognitive control training. Poster presented at the *54th Annual Meeting of the Psychonomic Society.* Toronto, Canada.

2013    Erika Hussey, Susan Teubner-Rhodes, **Alan Mishler**, Isaiah Harbison, Jared Novick. (2013). Trainability and selective transferability of conflict resolution skills to parsing and non-parsing domains. Paper presented at the *26th CUNY Sentence Processing Conference.* Columbia, SC.

2012    Erika Hussey, J. Isaiah Harbison, **Alan Mishler**, Susan Teubner-Rhodes, Jared M. Novick. (2012). Trainability and selective transferability of conflict resolution skills. Poster presented at the *53rd Psychonomic Society Annual Meeting.* Minneapolis, MN.

2012    Charles B. Chang, **Alan Mishler**. (2012). The role of canonicity in shaping perceptual biases in speech processing. Paper presented at the *13th Conference on Laboratory Phonology.* Stuttgart, Germany.

2012    Lelyn D. Saner, J. Isaiah Harbison, DeLaura Jansen, **Alan Mishler**. (2012). Crowd-sourced ratings yield the same empirical results as trained raters. Poster presented at the *24th Annual Convention of the Association for Psychological Science.* Chicago, IL.

2012    Susan E. Teubner-Rhodes, **Alan Mishler**, Ryan Corbett, Llorenc A. Barrachina, Monica Sanz-Torren, John C. Trueswell, Jared M. Novick. (2012). The bilingual advantage: Conflict monitoring, cognitive control, and garden-path recovery. Poster presented at the *25th Annual CUNY Conference on Human Sentence Processing.* New York, NY.

2012    **Alan Mishler**. (2012). Domain-initial strengthening in voiceless stops cues word boundary perception in Japanese. Paper presented at the *86th Annual Meeting of the Linguistic Society of America.* Portland, OR.

2011    Brian Dillon, **Alan Mishler**, Shayne Sloggett, Colin Phillips. (2011). Contrasting interference profiles for agreement and anaphora: Experimental and modeling evidence. Poster

presented at the *24th Annual CUNY Human Sentence Processing Conference*. Stanford, CA.

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## *Technical reports and products*

2016     **Alan Mishler**, Timothy Buckwalter, Wendy Chambers, Michael Bloodgood, Kevin Wonus, Paul Rodrigues, Marilyn Maines, Joseph Danks. (2016). *Filtering Tweets for Content Relevant to Social Unrest and Political Instability*. University of Maryland Center for Advanced Study of Language.

2016     **Alan Mishler**, Timothy Buckwalter, Kevin Wonus, Michael Bloodgood. (2016). *Computational Cultural Assessment (C2A) Software. [Python-based software for classifying Arabic tweets as relevant or not to social unrest.]* University of Maryland Center for Advanced Study of Language.

2016     **Alan Mishler**, Brook Hefright, Susannah B. F. Paletz, Ewa Golonka, Aynoor Ford. (2016). *Using Structural Topic Modeling to study public opinion and detect events*. University of Maryland Center for Advanced Study of Language.

2016     **Alan Mishler**, Timothy Buckwalter, Wendy Chambers, Michael Bloodgood, Paul Rodrigues, Marilyn Maines, Joseph Danks. (2016). *Machine classification of social media text along useful sociocultural dimensions*. University of Maryland Center for Advanced Study of Language.

2015     Erica B. Michael, Petra Bradley, **Alan Mishler**, Lelyn Saner, Brook Hefright, Ann Zeng, Allison Powell. (2015). *Evaluating the use of machine translation for performing language and analysis tasks*. University of Maryland Center for Advanced Study of Language.

2015     **Alan Mishler**, Gregory J. H. Colflesh, Justin Young, Meredith M. Hughes, Susan G. Campbell. (2015). *Assessment of Linguistic Tone Aptitude: Creating a battery based on validity evidence from field testing at DLIFLC*. University of Maryland Center for Advanced Study of Language.

2015     Paul Rodrigues, Wendy C. Chambers, Valerie Novak, Susannah Paletz, Jennifer Boutz, Tim Buckwalter, Erin Smith Crabb, Amy Pate, **Alan Mishler**, Joseph Danks, Marilyn Maines, Andrew Volpe, Allyson Slater, Salma Bouziani, Emily Iarocci. (2015). *Identification and machine classification of thematic and demographic factors related to social unrest and political instability*. University of Maryland Center for Advanced Study of Language.

2015     Isaiah Harbison, **Alan Mishler**, Thomas Wallsten. (2015). *Triage decision making task: An analyst-relevant outcome measure*. University of Maryland Center for Advanced Study of Language.

2014     Erica B. Michael, Brook Hefright, **Alan Mishler**, Petra Bradley. (2014). *Human use of translation technology: Evaluating the use of machine translation for performing language and analysis tasks*. University of Maryland Center for Advanced Study of Language.

2014     Susannah B. F. Paletz, Erin Smith Crabb, **Alan Mishler**, Brook Hefright, Ewa Golonka, Alexandria S. Campbell, Michael Maxwell, Marcos A. Garza. (2014). *Putting the human in the loop: Initial findings from sociocultural analysis [of Ukrainian Twitter data related to the Crimea conflict]*. University of Maryland Center for Advanced Study of Language.

2014     Ewa Golonka, Brook Hefright, Alexandria S. Campbell, **Alan Mishler**, Susannah B. F. Paletz, Erin Smith Crabb, Michael Maxwell, Marcos A. Garza. (2014). *Putting the human in the loop: Analysis of Language Variation [in Ukrainian Twitter data related to the Crimea conflict]*. University of Maryland Center for Advanced Study of Language.

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| 2014 | **Alan E. Mishler**, Polly L. O'Rourke, DeLaura M. Jansen, Patrick J. Cushen, Nina S Hsu, J. Isaiah Harbison, Jared M. Novick, Michael F. Bunting. (2014). *Working memory training for improving cognition and language: Impact and lessons learned from U.S. government populations.* University of Maryland Center for Advanced Study of Language. |
| 2013 | **Alan E. Mishler**, Polly L. O'Rourke, DeLaura M. Jansen, Patrick J. Cushen, Nina S Hsu, J. Isaiah Harbison, Jared M. Novick, Michael F. Bunting. (2013). *Working memory training for improving cognition and language: Impact and lessons learned from military and non-military populations.* University of Maryland Center for Advanced Study of Language. |
| 2012 | Michael F. Bunting, J. Isaiah Harbison, Polly O'Rourke, Patrick J. Cushen, **Alan E. Mishler**, DeLaura M. Jansen, Amber M. Sprenger. (2012). *Working Memory Training Applied.* University of Maryland Center for Advanced Study of Language. |
| 2012 | Susan E. Teubner-Rhodes, **Alan Mishler**, Ryan Corbett, Llorenc Andreu, Monica Sanz-Torrent, John C. Trueswell, Jared M. Novick. (2013). *The "bilingual advantage": How does speaking two languages affect cognitive control and language processing abilities?* University of Maryland Center for Advanced Study of Language. |
| 2012 | Lelyn D. Saner, J. Isaiah Harbison, DeLaura M. Jansen, **Alan Mishler**. (2012). *Crowdsourced ratings yield the same empirical results and trained raters.* University of Maryland Center for Advanced Study of Language. |
| 2012 | Jared M. Novick, J. Isaiah Harbison, **Alan Mishler**, DeLaura Jansen, Michael F. Bunting. (2012). *Cognitive and Working Memory Training Conference Report.* University of Maryland Center for Advanced Study of Language. |
| 2012 | Erika Hussey, J. Isaiah Harbison, **Alan Mishler**, Susan Teubner-Rhodes, Jared M. Novick. (2012). *The effect of executive function training on language processing: An interim report.* University of Maryland Center for Advanced Study of Language. |
| 2011 | **Alan Mishler**, Susan Teubner-Rhodes, Ryan Corbett, Jared Novick. (2011). *The "bilingual advantage": Does learning a second language improve working memory?* University of Maryland Center for Advanced Study of Language. |

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## *Workshops & invited talks*

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| 2011 | **Alan Mishler**. (2011, December). Working memory training to improve cognition and performance. Invited talks at Joint Base Lewis-McChord and Camp Murray. Tacoma, WA. |
| 2011 | **Alan Mishler**. (2011, August). Working memory training to improve cognition and performance. Invited talk at Maxwell Air Force Base. Montgomery, AL. |
| 2011 | **Alan Mishler**. (2011). Eyetracking with children. Session given at the *University of Maryland Winter Storm Language Science Workshop.* College Park, MD. |
| 2010 | **Alan Mishler**, Susan Teubner-Rhodes, Jared Novick. (2010). Eyetracking methodology: Visual worlds and self-paced reading. Workshop given at the *29th Annual Second Language Research Forum.* College Park, MD. |
| 2010 | **Alan Mishler**, Erika Hussey. (2010). Eyetracking: Theory and applications. Workshop given at the *University of Maryland Winter Storm Language Science Workshop.* College Park, MD. |

## Awards and Honors

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| 2017 | Winner (as part of a team of 4) of the Fall 2017 Citadel Data Open at Carnegie Mellon. (550 student applications, 125 selected to compete; $20,000 prize) |
| 2017 | Best short talk: "Subspace Clustering," Statistical Machine Learning Mini-Conference, Carnegie Mellon, Pittsburgh, PA. |

## Service and Volunteering

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| 2009–2016 | **Board member and recruitment and applications committee chair**, **Telluride Association**, an educational nonprofit devoted to providing educational opportunities for extraordinary and underprivileged high school students. |
| 2010–2015 | **Hiring committees**, **University of Maryland Center for Advanced Study of Language**: Vetted, interviewed, and reviewed candidates for a Data Scientist position, a Research Scientist position, and three Faculty Specialist positions. |
| 2013-2014 | **Research Specialist representative**, **University of Maryland Center for Advanced Study of Language**: represented and advocated for Faculty Research Specialists to executive leadership. Designed and conducted satisfaction surveys and presented results to leadership. |

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