

# Alan E. Mishler

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## Research interests

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

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## Skills

**Statistical and computational methods:** supervised and unsupervised learning (regression, classification, clustering), deep learning, feature engineering, hypothesis testing, repeated measures designs, hidden Markov models, network models, natural language processing, topic modeling

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

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

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## Education

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, <i>summa cum laude</i> , minor in Japanese, University of Michigan

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## Employment

06/18–08/18	<b>Data Science/Quantitative Analyst Intern:</b> Google. Building a machine learning pipeline to extract information from text for integration into various products.
05/17–08/17	<b>Graduate Data Science Intern, Business Analytics:</b> 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	<b>Senior Faculty Research Specialist:</b> 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.

09/11–08/13	<b>Consultant Phonetician:</b> 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.
8/09–9/10	<b>Post-Baccalaureate Research Fellow:</b> University of Maryland Department of Linguistics Worked on research on syntactic processing during reading and listening, using eye tracking and EEG.
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

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## Research

### *Peer-reviewed publications*

2018	<b>Alan Mishler</b> , Rebecca Nugent. (2018). Clustering students and inferring skill set profiles with skill hierarchies. <i>Proceedings of the 11th International Conference on Educational Data Mining</i> .
2018	Erica B. Michael, Petra Bradley, <b>Alan Mishler</b> , 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.), <i>Innovation and expansion in translation process research</i> , : 191–216. Amsterdam: John Benjamins Publishing Company.
2017	<b>Alan Mishler</b> , Kevin Wonus, Wendy Chambers, Michael Bloodgood. (2017). Filtering tweets for social unrest. <i>Proceedings of the 2017 IEEE 11th International Conference on Semantic Computing (ICSC)</i> . 10.1109/ICSC.2017.75.
2016	J. Isaiah Harbison, <b>Alan Mishler</b> , Thomas Wallsten. (2016). Modeling triage decision making. <i>Proceedings of the 38th Annual Conference of the Cognitive Science Society</i> .
2016	Erika K. Hussey, J. Isaiah Harbison, Susan E. Teubner-Rhodes, <b>Alan Mishler</b> , Kayla Velnoskey, Jared M. Novick. (2016). Memory and language improvements following cognitive control training. <i>Journal of Experimental Psychology: Learning, Memory, and Cognition</i> . <a href="https://dx.doi.org/10.1037/xlm0000283">https://dx.doi.org/10.1037/xlm0000283</a> .
2016	Susan Teubner-Rhodes, <b>Alan Mishler</b> , Ryan Corbett, Llorenç Andreu, Monica Sanz-Torrent, John Trueswell, Jared Novick. (2016). The bilingual advantage: conflict monitoring, cognitive control, and garden-path recovery. <i>Cognition</i> 150: 213–231. <a href="http://dx.doi.org/10.1016/j.cognition.2016.02.011">http://dx.doi.org/10.1016/j.cognition.2016.02.011</a> .
2013	Brian Dillon, <b>Alan Mishler</b> , Shayne Sloggett, Colin Phillips. (2013). Contrasting interference profiles for agreement and anaphora: experimental and modeling evidence. <i>Journal of Memory and Language</i> 69(2): 85–103. <a href="http://dx.doi.org/10.1016/j.jml.2013.04.003">http://dx.doi.org/10.1016/j.jml.2013.04.003</a> .
2012	Charles Chang, <b>Alan Mishler</b> . (2012). Evidence for language transfer leading to a perceptual advantage for non-native listeners. <i>Journal of the Acoustical Society of America</i> 132(4): 2700–10. <a href="http://dx.doi.org/10.1121/1.4747615">http://dx.doi.org/10.1121/1.4747615</a> .
2008	<b>Alan Mishler</b> . (2008). The discourse of voicemail. <i>Hermes Journal of Linguistics</i> 40: 167–197.

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### *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.

- 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*

- 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.

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## Awards and Honors

- 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.

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## Service and Volunteering

- 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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