Adam N. Goodkind

| CONTACT INFORMATION | Northwestern University
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RESEARCH STATEMENT

With an extensive background in computational linguistics and NLP, I study social interactions through the lens of keystroke timing. Since keystroke timing is both static and dynamic, it provides a unique level of deeper insight into user intent and cognition. I then use machine learning modeling, statistics, and data visualization to consolidate and share complex findings in an understandable fashion. Using these findings, I then work to create tools that improve user experiences.

EDUCATION

PhD, Northwestern University

Media, Technology & Society Program   2019–Present
PI: Darren Gergle (CollabLab)

Linguistics Department   2016–2019
PI: Klinton Bicknell (Language & Computation Lab)

Honors:
Data Science Fellowship
Cognitive Science Specialist

M.A., CUNY Graduate Center   2016
Computational Linguistics

M.A. Thesis: Utilizing Linguistic Context To Improve Identification in Typed Text
Thesis Advisors: Prof. Andrew Rosenberg and Prof. Martin Chodorow

B.A., Columbia University   2007
Religion (Study of Science & Religion)

RESEARCH EXPERIENCE

Research Assistant, CollabLab, Evanston, IL, USA   2019–Present
PI: Darren Gergle
- Running a crowd-sourced experiment for my dissertation utilizing keystroke-level analysis to understand social and cognitive differences in production timing and linguistic choices, depending on the perceived conversational partner.
- Analyze distributions of conversational turn timing alongside textual analysis.

Research Assistant, LangComp Lab, Evanston, IL, USA   2017–2019
PI: Klinton Bicknell
- Researched how linguistic predictability, measured with neural network-generated language models, affects sentence processing via eye-tracking.
- Investigated autism diagnoses using linguistic markers, using semantic similarity (word vectors) and pragmatic deficiencies.

Research Assistant, CUNY Speech Lab, New York, NY, USA   2012–2016
PI: Andrew Rosenberg
- Managed DARPA-funded initiative to improve security and personal authentication in computer use, by predicting keystroke and language patterns with machine learning algorithms.

Research Assistant, Columbia NLP Group, New York, NY, USA   2006–2007
PI: Rebecca Passonneau
- Supported NIST research program investigated auto-summarization of newswire articles.

NON-ACADEMIC EMPLOYMENT

PhD Data Science Intern, Vail Systems, Chicago, IL, USA   Summer 2020
- Created experiments to empirically evaluate the quality of text-to-speech (TTS) systems

Software Developer in Test Intern, Microsoft, Redmond, WA, USA   **Summer 2013**
- Developed website (back- and front-end) to diagnose licensing issues with Microsoft products
- Developed decision-making pipeline to aid in issue diagnosis

Operations Analyst, Goldman Sachs, Multiple Locations, USA   **2008–2011**
- Team Leader for Technology Enhancements
- Created software to streamline daily asset delivery workflow, from 3 hours to 25 minutes

LANGUAGES

Computer—Java, Python, R (ggplot2, plotly, lme4), C++, VBA, C#, LaTeX, MATLAB/Octave
Human—American Sign Language (ASL), Hebrew, Latin

HONORS AND
AWARDS

Best Paper Award, Cognitive Modeling & Computational Linguistics (CMCL)	**2018**
Developmental Sciences Cluster Fellowship - Finalist, Northwestern University	**2018**
Data Science Fellowship, Northwestern University	**2016–2017**
USS Donald and Mary Ellen Passantino Scholarship, CUNY Graduate Center	**2015**
Google Lime Connect Scholarship-Finalist	**2014**
Thomas W. Smith Academic Fellowship, CUNY Graduate Center	**2013–2014**
National Science Foundation, Undergraduate Research Grant, Columbia University	**2007**
Albert A. List Academic Fellowship	**2003–2007**
King's Crown Award for Outstanding Leadership, Columbia University	**2006**

PUBLICATIONS

Submitted **Goodkind, A.** TypeShift: A User Interface for Visualizing the Typing Production Process. https://arxiv.org/abs/2103.04222

Goodkind, A., Bicknell, K. Local word statistics affect reading times independently of surprisal. https://arxiv.org/abs/2103.04469

2020 **Goodkind, A.** An analytic model for human subjective judgements of computer-generated synthetic voice (TTS) quality. Technical Report for Vail Systems. Chicago, IL.

2018 **Goodkind, A.**, Lee, M., Martin, G. E., Losh, M., & Bicknell, K. Detecting language impairments in autism: A computational analysis of semi-structured conversations with vector semantics. In *Proceedings of the Inaugural Meeting of the Society for Computation in Linguistics.* Salt Lake City, UT: Linguistic Society of America. [paper] [slides]

Goodkind, A. & Bicknell, K. Predictive power of word surprisal for reading times is a linear function of language model quality. In *Proceedings of the 8th Workshop on Cognitive Modeling and Computational Linguistics (CMCL 2018).* Salt Lake City, UT: Linguistic Society of America. [paper] [slides]

2016 **Goodkind, A.**, Brizan D.G. & Rosenberg, A. *Utilizing Overt and Latent Linguistic Structure to Improve Keystroke-Based Authentication.* Image and Vision Computing: Best of Biometrics Special Issue.

2015 **Goodkind, A.**, Brizan D.G. & Rosenberg, A. *Improvements to Keystroke-Based Authentication By Adding Linguistic Context.* 7th IEEE Conference on Biometrics: Theory, Applications and Systems (BTAS 2015). (Slides)

Goodkind, A. & Rosenberg, A. *Muddying The Multiword Expression Waters: How Cognitive Demand Affects Multiword Expression Production. 11th Workshop on Multiword Expressions at NAACL-HLT 2015.* (Slides)

Brizan, D. G.*, **Goodkind, A.***, Koch, P., Balagani, K., Phoha, V. V., & Rosenberg, A. *Utilizing Linguistically-Enhanced Keystroke Dynamics to Predict Typist Cognition and Demographics. International Journal of Human-Computer Studies, October 2015, vol. 84, 57-68.*

2014 Locklear, H., Govindarajan, S., Sitova, Z., **Goodkind, A.**, Brizan, D., Rosenberg, A., Phoha, V., Gasti, P., & Balagani, K. *Continuous Authentication with Cognition-centric Text Production and Revision Features. Biometrics (IJCB), 2014 IEEE International Joint Conference.*

2013 Serwadda, A.,Balagani, K., Wang, Z., Koch, P., Govindarajan, S., Pokala, R., **Goodkind, A.**, Brizan, D.G., Rosenberg, A., & Phoha, V. *Scan-based Evaluation of Continuous Keystroke Authentication Systems. IT Professional, 15(4), 20-23*.

2008 **Goodkind, A.** *Tracking the Emergence of Narrative Competence in Story Retelling. Quebec Student Journal of Linguistics, Vol. 3*.

2007 Passonneau, R. J., **Goodkind, A.**, & Levy, E. T. *Annotation of Children's Oral Narrations: Modeling Emergent Narrative Skills for Computational Applications. Florida Artificial Intelligence Research Society (FLAIRS), 253-258*.

2006 Passonneau, R., McKeown, K., Sigelman, S., & **Goodkind, A.**. *Applying the Pyramid Method in the 2006 Document Understanding Conference. Proceedings of the 2006 Workshop of the Document Understanding Conference (DUC).*

PRESENTATIONS

2018 Lee, M.A., Martin, G.E., **Goodkind, A.**, Bicknell, K., Maltman, N., Bush, L., Losh, M. *A Multi-Method Approach to Characterizing Pragmatic Language Development in Individuals with FXS*. Paper presented at the International Fragile X Conference, Cincinnati, OH, July, 2018

Goodkind, A.. *Complex Data Visualization: Visualizing language production dynamics via keystroke analysis.* Presentation at Inaugural Data Science Research Day, Northwestern University Institute on Complex Systems, 25 June 2018. (Slides)

Goodkind, A.. *Demo of TypeShift software system for tracking keystroke dynamics* at Individual Differences Workshop, Northwestern University, 30 May 2018. (Code)

Lee, M.A., Martin, G.E., **Goodkind, A.**, Bicknell, K., Maltman, N., Bush, L., Losh, M. *A longitudinal, multi-method analysis of pragmatic language in ASD and related developmental disabilities.* Poster presented at the International Society for Autism Research, May, 2018, Rotterdam, Netherlands

Goodkind, A. & Bicknell, K.. *Low-level language statistics affect reading times independently of surprisal.* Poster presentation at the 31st annual CUNY Conference on Human Sentence Processing, UC Davis, Davis, California, 15–17 March 2018.

2015 Goldman, N. & **Goodkind, A.**. *Worth 1,😊😃😆 Words: The Linguistics of Emoji and Emoji of Linguistics.* SQUID X: 10th Annual Conference Showcasing Quirky and Original Ideas in Development. New York, NY April 24, 2015. (Slides)

2014 **Goodkind, A.**. *Detecting Multi-word Expressions Through Typing Patterns. 15th Texas Linguistics Society Conference, Austin ,TX, October 24-26, 2014* (Slides)

Goodkind, A.. *Detecting Multi-word Expressions in Computer Keyboard Produced Text. CUNY Research Day*, New York, NY

TEACHING EXPERIENCE

Teaching Assistant
Northwestern University
- Communication Studies 351: Technology & Human Interaction (Prof. Darren Gergle), 2021
- Linguistics 220: Language & Society (Prof. Annette D'Onofrio), 2018
  - Guest lecture on quantitative data analysis
- Cognitive Science 210: Language & the Brain (Profs. Matt Goldrick & Mark Beeman), 2019
- Linguistics 221: Language & Prejudice (Prof. Erin Leddon), 2019

DEPARTMENTAL SERVICE

Co-organizer, Northwestern Text Analytics Working Group	**2018–Present**
Founder, Northwestern NLP Group	**2017–2018**
Founder, Linguistics Deep Learning Reading Group	**2017–Present**
Web & Social Media Coordinator, Linguistics	**2017–Present**
Colloquium Reception Committee, Linguistics	**2016–2017**

PROFESSIONAL
ACTIVITIES

Diversity & Inclusivity Committee, NAACL 2019, Committee Member
Association of Computing Machinery (ACM), Member
ACM SIGCHI, Member
DevSci Cluster, Northwestern University, Member
Institute of Electrical and Electronics Engineers (IEEE), Member
Linguistic Society of America (LSA), Member
Association for Computational Linguistics (ACL), Member
Financial Industry Regulatory Authority (FINRA), Member