# Dr. Rachel Ostrand

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## Professional Experience

**IBM Research**, Yorktown Heights, NY
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| Staff Research Scientist | 2022 – present |
| Research Scientist | 2018 – 2022 |
| Post-Doctoral Researcher | 2016 – 2018 |

**University of California, San Diego**, San Diego, CA
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| Visiting Scholar | 2021 – 2022 |

**Kent State University**, Kent, OH
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| Adjunct Assistant Professor | 2017 – present |

**Nuance Communications**, Sunnyvale, CA
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| Language Modelling and User Interface Design Intern | 2014 |

## Education

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| **Ph.D.**, Cognitive Science: University of California, San Diego | 2016 |
| **M.S.**, Cognitive Science: University of California, San Diego | 2012 |
| **Sc.B.**, Cognitive Science (Honors): Brown University | 2009 |

## Grants and Fellowships

**NIH P01 AG073090** ($16,427,515), *National Institute on Aging*: "Center for Research and Education on Aging and Technology Enhancement – CREATE" — 2022 – 2027
  Role: Consultant (PI: Sara Czaja, Weill Cornell Medical College)

**NIH R01 AG065432** ($2,577,738), *National Institute on Aging*: "Spontaneous Speech and Health Disparities in Risk of Cognitive Decline: WHICAP Offspring Ancillary Study" — 2020 – 2024
  Role: co-PI

**IBM Faculty Award** ($6,000), *IBM Research*: "How is the processing of ambiguous speech affected by a global pandemic?" — 2020
  Role: co-I (PI: Eva Wittenberg, UC San Diego)

**Cleveland Brain Health Initiative Scholars Grant** ($20,000), *CBHI*: "Using automated speech analysis to predict cognitive decline and future Alzheimer's Disease" — 2019 – 2020
  Role: co-PI

**Dwight David Eisenhower Graduate Fellowship** ($35,500), *US Department of Transportation* — 2015 – 2016
  Role: Graduate student grantee
  #1 ranked recipient out of hundreds of applicants nationwide

**Glushko Graduate Fellowship**, *Robert J. Glushko and Pamela Samuelson Foundation* — 2010 – 2014
  Role: Graduate student grantee

## Honors and Awards

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| **Outstanding Research Accomplishment ("The Engagement Catalysts")**, *IBM Research* | 2024 |
| **Invited Participant at US-Africa Frontiers of Science, Engineering, and Medicine Symposium**, *US National Academy of Sciences* | 2024 |
| **Fellow**, *Psychonomic Society* | 2023 |
| **Patent Recognition Award**, *Society of Women Engineers* | 2023 |
| **Outstanding Research Accomplishment ("Scientific Discoveries on Disease Progression")**, *IBM Research* | 2021 |
| **Research Accomplishment ("Measuring Chronic Pain")**, *IBM Research* | 2021 |
| **Frontiers of Engineering Fellow**, *US National Academy of Engineering* | 2020 |

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| **IBM Eminence & Excellence Award**, *IBM Research* | 2020 |
| **Dean of Social Sciences Travel Award**, *UC San Diego* | 2015 |
| **Bates Graduate Research Travel Award**, *Center for Research in Language, UC San Diego* | 2014 |
| **Graduate Excellence Award**, *Cognitive Science Department, UC San Diego* | 2011 |
| **Grindley Grant**, *Experimental Psychology Society* | 2011 |
| **E. A. Mooar Prize for Best Undergraduate Honors Thesis**, *Cognitive Science Department, Brown University* | 2009 |
| **AT&T Foundation Scholarship for Outstanding Scholasticism**, *AT&T Foundation* | 2008 |

## Publications

- **Ostrand, R.**, Berger, S.E. (2024). Humans Linguistically Align to their Conversational Partners, and Language Models Should Too. *Proceedings of the Workshop on Large Language Models and Cognition at International Conference of Machine Learning (ICML) 2024*.

- **Ostrand, R.**, Brimijoin, K., Piorkowski, D., He, J., Albert, E., Houde, S. (2024). Say what? Real-time linguistic guidance supports novices in writing utterances for conversational agent training. *Proceedings of the 6th ACM Conference on Conversational User Interfaces (CUI '24), Article 15*, 1-12.

- Piorkowski, D., **Ostrand, R.**, Brimijoin, K., He, J., Albert, E., Houde, S. (2024). Towards Interactive Guidance for Writing Training Utterances for Conversational Agents. *Proceedings of the 6th ACM Conference on Conversational User Interfaces (CUI '24), Article 14,* 1-15.

- Do, H.J., **Ostrand, R.**, Weisz, J.D., Dugan, C., Sattigeri, P., Wei, D., Murugesan, K., Geyer, W. (2024). Facilitating Human-LLM Collaboration through Factuality Scores and Source Attributions. *Proceedings of Workshop on Trust and Reliance in Evolving Human-AI Workflows (TREW) at CHI 2024*.

- **Ostrand, R.**, Ferreira, V.S., Piorkowski, D. (2023). Rapid Lexical Alignment to a Conversational Agent. *Proceedings of Interspeech 2023*, 2653-2657.

- Hamrick, P., Sanborn, V., **Ostrand, R.**, Gunstad, J. (2023). Lexical Speech Features of Spontaneous Speech in Older Persons With and Without Cognitive Impairment: Reliability Analysis. *JMIR Aging, 6*:e46483.

- Dorsi, J., **Ostrand, R.**, Rosenblum, L.D. (2023). Semantic Priming from McGurk words: Priming depends on perception. *Attention, Perception, & Psychophysics. 85,* 1219-1237.

- Piorkowski, D., **Ostrand, R.**, Rizk, Y., Isahagian, V., Muthusamy, V., Weisz, J.D. (2022). Accuracy is Not All You Need. *NeurIPS Workshop on Human-Centered AI*.

- **Ostrand, R.**, Ryskin, R. (Stage 1 Registered Report accepted). Learning speaker-specific structural expectations. *Journal of Cognitive Neuroscience*.

- Kleinman, D., Morgan, A.M., **Ostrand, R.**, Wittenberg, E. (2022). Lasting effects of the COVID-19 pandemic on language processing. *PLoS ONE 17*(6), e0269242.

- Sanborn, V., **Ostrand, R.**, Ciesla, J., Gunstad, J. (2022). Automated Assessment of Speech Production and Prediction of MCI in Older Adults. *Applied Neurology: Adult, 29(5)*, 1250-1257.

- **Ostrand, R.**, Chodroff, E. (2021). It's alignment all the way down, but not all the way up: Speakers align on some features but not others within a dialogue. *Journal of Phonetics, 88,* 101074.

- Abrami, A., Gunzler, S., Kilbane, C. **Ostrand, R.**, Ho, B.K., Cecchi, G. (2021). Automated computer vision assessment of hypomimia in Parkinson's disease. *Journal of Medical Internet Research, 23*(2):e21037.

- **Ostrand, R.**, Gunstad, J. (2021). Using Automatic Assessment of Speech Production to Predict Current and Future Cognitive Function in Older Adults. *Journal of Geriatric Psychiatry and Neurology, 34*(5), 357–369.

- Agurto, C., Cecchi, G.A., Norel, R., **Ostrand, R.**, … Bedi, G. (2020). Detection of Acute 3,4-Methylenedioxymethamphetamine (MDMA) Effects Across Protocols Using Automated Natural Language Processing. *Neuropsychopharmacology*, *45*, 823-832.

- Norel, R., Agurto, C., Heisig, S., Rice, J.J., Zhang, H., **Ostrand, R.**, ... Cecchi, G.A. (2020). Speech-based characterization of dopamine replacement therapy in people with Parkinson's disease. *npj Parkinson's Disease, 6*, 12.

- **Ostrand, R.**, Ferreira, V.S. (2019). Repeat after us: Syntactic alignment is not partner-specific. *Journal of Memory and Language, 108*, 104037.

- Gruberg, N., **Ostrand, R.**, Momma, S., Ferreira, V.S. (2019). Syntactic entrainment: The repetition of syntactic structures in event descriptions. *Journal of Memory and Language, 107,* 216-232.

- Agurto, C., Norel, R., **Ostrand, R.**, … Cecchi, G.A. (2017). Phonological markers of Oxytocin and MDMA ingestion. *Proceedings of Interspeech 2017*, 3142-3146.

- **Ostrand, R.**, Blumstein, S.E., Ferreira, V.S., Morgan, J.L. (2016). What you see isn't always what you get: Auditory word signals trump consciously perceived words in lexical access. *Cognition*, *151*, 96-107.

- **Ostrand, R.**, Blumstein, S.E., Morgan, J.L. (2011). When hearing lips and seeing voices becomes perceiving speech: Auditory-visual integration in lexical access. *Proceedings of the 33rd Annual Conference of the Cognitive Science Society*, 1376-1381.

## Publications Under Review

- Flick, G., **Ostrand, R.** (under review). Automatically calculated lexical and discourse features of connected speech predict level of impairment in dementia.

## Patents

- Real-time discussion relevance feedback interface (US20220157301A1). J.P. O'Connor, R. Ostrand. https://patents.google.com/patent/US20220157301A1/en (*granted*).

- Automatically detecting need for breakout virtual meeting (US20220303321A1). R. Ostrand, J.P. O'Connor. https://patents.google.com/patent/US20220303321A1/en (*granted*).

- Acoustic analysis of crowd sounds (US20230186942A1). R. Ostrand, V. Figueredo De Santana, A.P.D. Binotto. https://patents.google.com/patent/US20230186942A1/en (*granted*).

- Speaker-specific voice amplification (US20220199102A1). R. Ostrand, S. Saranathan, F. Lu, C.P. Agurto Rios. https://patents.google.com/patent/US20220199102A1/en (*filed*).

- Generating interview questions based on semantic relationships (US20220391849A1). J.P. O'Connor, R. Ostrand. https://patents.google.com/patent/US20220391849A1/en (*filed*).

- Monitoring and querying autobiographical events (US20230147846A1). R. Ostrand, J. Reinen, R. Anderson, J. Kozhaya. https://patents.google.com/patent/US20230147846A1/en (*filed*).

- Adaptive, personalized management system for training compliance (US20240265318A1). R. Ostrand., J.P. O'Connor. https://patents.google.com/patent/US20240265318A1/en (*filed*).

## Invited Talks (Selected)

- Connected Speech Production can Predict Cognitive Decline and Methodological Considerations for Collecting it from Older Adults. *University of Illinois, Urbana-Champaign,* Dec 8, 2023.

- Using Lexical and Contextual Features of Spontaneous Speech Production to Predict Cognitive Impairment in Early-Stage Dementia. *UC San Diego Center for Research in Language*, Feb 7, 2023.

- Automated Assessment of Spontaneous Speech Production as a Predictive Marker of Cognitive Decline. *Haskins Laboratories*, Feb 17, 2022.

- Spontaneous Speech Production as a Predictive Marker of Cognitive Decline in Alzheimer's and other Dementias. *FOQUS Aphasia*, Dec 9, 2021.

- Spontaneous Speech Production as a Diagnostic Marker of Dementia. *National Academy of Engineering - Frontiers of Education Scholars*, Nov 15, 2021.

- Psycholinguistics and Cognitive Science. *Rutgers University Cognitive Science Club*, Sep 15, 2021.

- Future of... Psycholinguistics. *What's Next in AI Workshop Series, IBM Research*, Aug 27, 2021.

- Thinking About Thinking: Neuroethics and Why You Should Care. *IBM Research Horizons,* Apr 22, 2021.

- Using speech production to detect dementia and cognitive decline. *IBM Research Horizons Science Slam,* Mar 3, 2020.

- Career Possibilities in STEM (Keynote). *UC San Diego Society for Women Engineers Envision Conference*, Feb 8, 2020.

- Using speech production to detect dementia and cognitive decline. *IBM Research Horizons Science Slam,* Oct 22, 2019.

- Using Computational Psychiatry as a Diagnostic Tool. *IBM Board of Directors Annual Strategy Meeting*, Sep 25, 2017.

- Linguistic Alignment in Dialogue and Cognitive Disorders. *Educational Testing Service (ETS)*, Mar 9, 2017.
- When Do We Talk (and Listen) Like Each Other? Linguistic Adaptation in Speech Production and Comprehension. *Kent State University*, Dec 5, 2016.

- Why (and When) Do Speakers Talk Like Each Other? *University of Illinois, Urbana-Champaign*, Jan 22, 2016.

- What You See Isn't Always What You Get. *UC San Diego Center for Research in Language*, May 12, 2015.

## Science Outreach Experience

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| **Family Science Saturday Class Instructor**, *IBM Research, Yorktown Heights, NY* | 2018 – present |
| **THINK Lab Science Communications Rotation**, *IBM Research, Yorktown Heights, NY* | 2021 – 2022 |
| **Girls & Boys Go Tech Know STEM Camp Instructor**, *IBM Research, Yorktown Heights, NY* | 2017 – 2020 |
| **Science Outreach Coordinator,** *Fleet Science Center, San Diego, CA* | 2015 – 2016 |
| **Gallery Facilitator, Mentor, & Hands-on Science Demonstrator**, *Fleet Science Center, San Diego, CA* | 2013 – 2016 |
| **Saturday Science Club for Girls Education Volunteer**, *Fleet Science Center, San Diego, CA* | 2013 – 2016 |
| **Pint of Science Festival (http://pintofscience.us/) Organizing Committee**, *San Diego, CA* | 2014 – 2015 |

## Mentorship Experience

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| **Mentor and Intern/Project Supervisor for undergraduate and graduate Students** | 2012 – present |
| **Mentor for NYC community college students**, *City Tutors* | 2020 – present |
| **Mentor for graduate students at various conference mentoring events**, *Women in Cognitive Science; Academy of Aphasia; Human Sentence Processing Conference* | 2019 – present |
| **IBM Research-Yorktown New Hire Network Coordinator**, *IBM Research* | 2017 – 2020 |
| **Mentor/Project supervisor for high school science research student**, *Yorktown Heights High School* | 2018 – 2020 |
| **Cognitive Science department Graduate Liaison to undergraduates**, *UC San Diego* | 2011 – 2016 |
| **Graduate Advisor on undergraduate honors thesis committees**, *UC San Diego* | 2011 – 2013 |

## Ad Hoc Reviewing

**Journals:**
Attention, Perception, & Psychophysics; Cortex; Discourse Processes; Frontiers in Communication; Frontiers in Psychology; Language, Cognition, & Neuroscience; PLOS ONE; Psychonomic Bulletin & Review

**Conferences:**
Architectures and Mechanisms in Language Processing (AMLaP); Conference on Human Sentence Processing (HSP, formerly CUNY); ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW); ACM Conference on Conversational User Interfaces (CUI)

**Book proposals and funding agencies:**
National Science Foundation; Leverhulme Trust; Elsevier; SAGE