Alexandra Salem

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Education

2024–Present **PhD in Computer Science**, *City University of New York (CUNY) Graduate Center*, New York, NY.

Field   Natural Language Processing

Mentor   Sarah Ita Levitan

Relevant Coursework

Machine Learning, Algorithms

2018–2021 **MS in Computer Science & Engineering**, *Oregon Health & Science University*, Portland, OR.

Relevant Coursework

Natural Language Processing, Machine Learning, Advanced Machine Learning, Deep Learning, Deep Learning II, Intro to Image Processing, Introduction to Database Management, Problem Solving with Large Clusters, Research Ethics for Computer Science & Electrical Engineering, Data Science Programming, Data Visualization, Probability & Statistics

2012–2016 **BA in Mathematics**, *Reed College*, Portland, OR.

Relevant Coursework

Introduction to Computing, Data Structures and Algorithms, Single and Multivariable Calculus, General Physics I & II, Probability Theory, Real Analysis, Abstract and Linear Algebra, Combinatorics

Work Experience

Aug 2024–Present **Graduate Assistant**, City University of New York (CUNY) Graduate Center, New York, NY.

Sept 2024–Present **Data Science Mentor (Part-Time)**, Posit Academy, Remote.
- Run cohorts of working professions learning R or Python data science skills.
- Meet with cohorts twice a week for question-answering and presentation critique.

Nov 2016–Aug 2024 **Research Staff, Department of Medical Informatics and Clinical Epidemiology/Center for Spoken Language Understanding**, Oregon Health & Science University, Portland, OR.

Informatician III, Dec 2023 – Aug 2024 &
Research Data Analyst II, Nov 2021– Dec 2023 &
Senior Research Assistant, July 2021– Nov 2021 .
- Developed and improved software applications for automated systems of assessment of clinical language data using machine learning and NLP.
- Independently designed and executed scientific experiments for evaluating the efficacy of assessment software utilizing advanced statistical methods.
- Analyzed, visualized and summarized data findings using Python & R statistical software.
- Wrote scientific papers for journals and conferences.
- Presented research at conferences to mixed audiences from clinical and computational fields.
- Contributed to writing grant applications and progress reports.
- Collaborated with experimental scientists from clinical and computational fields.

Research Assistant II, *Sept 2017– July 2021*.
- Designed data collection, data management, and data annotation protocols for audiovisual data derived from clinical contexts.
- Transcribed speech of children with autism using ELAN software.
- Contributed to scientific report writing and presented research at conferences to mixed audiences from clinical and computational fields.
- Conducted administrative duties such as coordinating team meetings and monitoring IRB compliance.

Research Volunteer, *Nov 2016– Sept 2017*.
- Developed a data processing pipeline using R statistical software for clinical language data.
- Annotated audiovisual clinical language data.

May 2022– July 2022   **Machine Learning Scientist Master's Intern**, *Cambia Health Solutions*, Portland, OR.
- Retrained, evaluated, and deployed a machine learning classifier in Python for filtering medical claims data. This model reduced member abrasion and claims workload.
- Presented the model to technical and non-technical audiences.

Feb 2017– Sept 2017   **Tutor/Academic Specialist**, *North Avenue Education*, Portland, OR.
- Provided one-on-one tutoring sessions to students in Algebra, Geometry, Algebra 2, Probability & Statistics, and AP Calculus.
- Planned individualized lessons for as many as ten students at a time.

Additional Experience

Summer 2014   **Summer Mathematics Program for Women (SMP)**, *Carleton College*, Northfield, MN.
- NSF-funded program to encourage and support women in their study of mathematics.
- Studied Introduction to Lie Theory, Low Dimensional Topology.

Skills

Python (experience with PyTorch, TensorFlow, Transformers, SciKit-Learn, Pandas, Numpy, PySpark etc), R (ggplot, tidyverse), SQL, Slurm, Git, HTML, CSS, JavaScript, LaTeX, MS Office, Audacity, ELAN, Mathematica

Publications

Salem, A. C., Gale, R. C., Fleegle, M., Fergadiotis, G., & Bedrick, S. (2023). Automating intended target identification for paraphasias in discourse using a large language model. *Journal of Speech, Language, and Hearing Research.* `https://doi.org/10.1044/2023_JSLHR-23-00121`

Gale, R., Salem, A. C., Fergadiotis, G., & Bedrick, S. (2023). Mixed Orthographic/Phonemic Language Modeling: Beyond Orthographically Restricted Transformers (BORT). *8th Workshop on Representation Learning for NLP.* Association for Computational Linguistics. `https://doi.org/10.18653/v1/2023.repl4nlp-1.18`.

MacFarlane, H., Salem, A. C., Bedrick, S., Dolata, J. K., Wiedrick, J., Lawley, G. O., Finestack, L. H., Kover, S. T., Thurman, A. J., Abbeduto, L., & Fombonne, E. (2023). Consistency and reliability of automated language measures across expressive language samples in autism. *Autism Research.* `https://doi.org/10.1002/aur.2897`

Casilio, M., Fergadiotis, G., Salem, A. C., Gale, R., McKinney-Bock, K., & Bedrick, S. (2023). ParAlg: A paraphasia algorithm for multinomial classification of picture naming errors. *Journal of Speech, Language, and Hearing Research.* `https://doi.org/10.1044/2022_JSLHR-22-00255`

Salem, A. C., Gale, R., Casilio, M., Fleegle, M., Fergadiotis, G., & Bedrick, S. (2022). Refining semantic similarity of paraphasias using a contextual language model. *Journal of Speech, Language, and Hearing Research.* `https://doi.org/10.1044/2022_JSLHR-22-00277`

Lawley, G. O., Bedrick, S., MacFarlane, H., Dolata, J. K., Salem, A. C., & Fombonne, E. (2022). "Um" and "Uh" Usage Patterns in Children with Autism: Associations with Measures of Structural and Pragmatic Language Ability. *Journal of Autism and Developmental Disorders.* `https://doi.org/10.1007/s10803-022-05565-4`

MacFarlane, H., Salem, A. C., Chen, L., Asgari, M., & Fombonne, E. (2022). Combining voice and language features improves automated autism detection. *Autism Research*, 15(7), 1288–1300. `https://doi.org/10.1002/aur.2733`

Salem, A. C., MacFarlane, H., Adams, J. R., Lawley, G. O., Dolata, J. K., Bedrick, S., & Fombonne, E. (2021). Evaluating atypical language in autism using automated language measures. *Scientific Reports*, 11(1), 10968. `https://doi.org/10.1038/s41598-021-90304-5`

Adams, J. R., Salem, A. C., MacFarlane, H., Ingham, R., Bedrick, S. D., Dolata, J. K., Hill, A. P., Fombonne, E., & van Santen, J. (2021). A pseudo-value approach to measuring lexico-semantic similarity in the language of children with or without autism. *Frontiers in Psychology.* `https://doi.org/10.3389/fpsyg.2021.668344`

Fombonne, E., MacFarlane, H., & Salem, A. C. (2021). Epidemiological surveys of ASD: Advances and remaining challenges. *Journal of Autism and Developmental Disorders.* `https://doi.org/10.1007/s10803-021-05005-9`

MacFarlane, H., Salem, A. C., Lawley, G. O., Hill, A. P., Zuckerman, K., & Fombonne, E. (2022). Epidemiology of ASD. In *Textbook for Autism Spectrum Disorders* (2nd ed.). American Psychiatric Association Publishing.

Presentations/Talks

Salem, A. C., Gale, R., Fergadiotis, G., & Bedrick, S. (2024, May). *Automating intended paraphasia identification for paraphasias in discourse using a large language model.* Poster presented by Alexandra Salem at: 53rd Clinical Aphasiology Conference, Big Island of Hawai'i, HI.

Salem, A. C., White, E., Lin, W.-C., Tham, A., Bellsmith, K., Kuo, A., Anderson, J., Summers, A., Reznick, L., & Hribar, M. (2024, May). *Predicting loss and delay to follow-up of amblyopia patients.* Poster by Alexandra Salem at: 2024 Association for Research in Vision and Ophthalmology Annual Meeting, Seattle, WA.

Salem, A. C.. (2024, April). *Automatically assessing paraphasias in discourse: Breakthroughs and remaining challenges.* Invited talk by Alexandra Salem at La Trobe University Aphasia CRE Seminar Series. Melbourne, Victoria, Australia (Virtual).

Salem, A. C., Gale, R., Fleegle, M., Fergadiotis, G., & Bedrick, S. (2023, June). *Automating intended target identification for paraphasias in discourse using a large language model.* Poster presented by Alexandra Salem at: 52nd Clinical Aphasiology Conference, Atlantic City, NJ.

Salem, A. C., Gale, R., Fergadiotis, G., & Bedrick, S. (2021, October). *Improving Automatic Semantic Similarity Classification of the PNT.* Poster presented by Alexandra Salem at: Academy of Aphasia 59th Annual Meeting, Online.

Salem, A. C., Gale, R., & Bedrick, S. (2021, May). *Fine-tuning BERT for the semantic classifier of the PNT.* Short talk by Alexandra Salem at: Oregon Health & Science University Research Week, Portland, OR.

Salem, A. C., Gale, R., & Bedrick, S. (2021, March). *Fine-tuning BERT for the semantic classifier of the PNT.* Talk by Alexandra Salem at: Masters Final Project Department Talk, Oregon Health & Science University, Portland, OR.

MacFarlane, H., Salem, A. C., Adams, J. R., Lawley, G. O., Dolata, J., Bedrick, S., & Fombonne, E. (2021, May). *Evaluating Atypical Language in Autism Using Automated Discourse Measures.* Short talk by Heather MacFarlane at: Oregon Health & Science University Research Week, Portland, OR.

Salem, A. C., MacFarlane, H., Adams, J. R., Lawley, G. O., Dolata, J., Bedrick, S., & Fombonne, E. (2021, May). *Evaluating Atypical Language in Autism Using Automated Discourse Measures.* Poster presented by Eric Fombonne at: International Society for Autism Research Annual Meeting, Boston, MA.

Salem, A. C., MacFarlane, H., Lawley, G. O., Dolata, J., & Fombonne, E. (2020, May). *Intra-Annotator Reliability of a Transcription Corpus.* International Society for Autism Research Annual Meeting, Seattle, WA. (Convention cancelled)

MacFarlane, H. Salem, A. C., Lawley, G. O., Dolata, J., & Fombonne, E. (2020, May). *Using MLU to Evaluate the Reliability of ADOS Transcription.* Oregon Health & Science University Research Week, Portland, OR. (Convention cancelled)

Adams, J. R., Salem, A. C., MacFarlane, H., Ingham, R., Bedrick, S. D., Dolata, J. K., Hill, A. P., Fombonne, E., & van Santen, J. (2020, May). *Semantic similarity of conversational speech between children with and without autism spectrum disorder.* Oregon Health & Science University Research Week, Portland, OR. (Convention cancelled)

Salem, A. C. (2018, August). *A sentimental analysis of Tolstoy.* Invited talk at: Portland R User Group Meeting, Portland, OR.

Adams, J. R., Salem, A. C., Hill, A. P., Bedrick, S., & van Santen, J. (2018, May). *Semantic similarity of conversational speech between children with and without ASD.* Poster presented by Joel Adams and Alexandra Salem at: Oregon Health & Science University Research Week, Portland, OR.

Adams, J. R., Salem, A. C., Hill, A. P., Bedrick, S., & van Santen, J. (2018, April 27). *Semantic similarity of conversational speech between children with and without ASD.* Short Talk by Joel Adams at: 5th Pacific Northwest Regional NLP Workshop: NW-NLP, 2018, Redmond, WA.

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