

# Alex Ritchie

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Innovative and technical Machine Learning (ML) expert pursuing opportunities to utilize strong leadership, technical, teamwork, and communication skills to solve complex problems and provide insight from data. Key accomplishments:

- Architected and developed Natural Language Processing (NLP) solutions at Amazon that have generated substantial business value
- Led technical efforts and managed several successful research projects with publications at top ML conferences

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## Work Experience

**Non-Von** - Artificial Intelligence Engineer

*July 2023 - Present*

- Lead research and development of bio-inspired ML algorithms in co-design of neuromorphic hardware
- Leverage latest results from neuroscience and ML to create new models and refine system design
- Developer focused on model training, efficient inference, approximation algorithms, optimization, and firmware

**Amazon** - Applied Scientist Intern (Alexa Speech)

*Summer 2021*

- Led development of a Transformer architecture for speaker identification
- Performed design, implementation, training, and analysis as solo developer on the project
- Delivered a percentage point increase in intra-home speaker ID accuracy via reduction of false positives

**ExxonMobil** - Electrical Field Engineer Intern

*Summer 2017*

- Led the upgrade and redesign of the control system for a key terminal of a major US pipeline
- Delivered system design, control logic, and oversaw on-site installation

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## Education

**University of Michigan**

*2017 - Present*

- **Ph.D. in Electrical and Computer Engineering (ML Track)**  
*Expected Completion December 2025*
- **MS in Electrical and Computer Engineering (ML Track)**  
*GPA: 3.82*

**Georgia Institute of Technology**

*2014 - 2016*

- **BS in Electrical Engineering, highest honors**  
*GPA: 3.87*

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## Skills

**Skill Areas:** Generative AI, NLP, Computer Vision, Statistical Modeling, Data Analysis, Optimization

**Methods/Models:** LLMs / Transformers, Prompt Engineering, RAG, Diffusion Models, Classical ML, Ensemble Methods

**Programming:** Python, C++, Bash, Julia, R, Matlab

**Python Libraries:** PyTorch, Pandas, Keras, Transformers, NLTK, LangChain, Scikit-Learn, SciPy, NumPy

**Tools/Data:** Git, SVN, SQL, Linux, Tableau, Excel

**Cloud (AWS):** Sagemaker, Rekognition, DynamoDB, Glue, Kinesis

**Professional:** Communication, Problem Solving, Collaboration, Time Management, Decision Making, Critical Thinking

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## Selected Publications

**Online Platforms and the Fair Exposure Problem Under Homophily.** J Schoeffer, A Ritchie, K Naggita, F Monachou, J Finocchiaro, M Juarez. *37th AAAI Conference on Artificial Intelligence, 2023*

**Consistent Estimation of Identifiable Nonparametric Mixture Models from Grouped Observations.** A Ritchie, R Vandermeulen, C Scott - *Advances in Neural Information Processing Systems, 2020*

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