William Convertino

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Education

Duke University — Durham, NC
PhD — *Jan 2025 - Present*
GPA: 3.7

Duke University — Durham, NC
Bachelor of Science in Computer Science — *Aug 2020 - May 2024*
GPA: 3.8

Coursework and Skills

Research Areas: Transformers, Language Modeling, Computer Vision, Metamodeling
Relevant Coursework: Large Language Models, Natural Language Processing, Deep Learning Engineering
Languages and Tools: Python, PyTorch, SQL

Publications

On Understanding Attention-Based In-Context Learning for Categorical Data
ICML 2025 (Accepted)

- Led the development of the language modeling component as second author, extending theoretical foundations of in-context learning (ICL) from continuous to categorical domains.
- Co-authored novel framework enabling attention-based models to perform gradient descent-style learning over categorical data, advancing interpretability and adaptability in transformer-based NLP systems.

Work Experience

Research Assistant — Jun 2024 - Dec 2024
Duke University — *Durham, NC*

- Researched gradient descent metamodeling and how it relates to transformer-based language models

Software Developer — Oct 2023 - Jun 2024
GreySun Technologies — *Raleigh, NC*

- Developed and launched cross-platform mobile apps (iOS/Android) using React Native
- Built backend features to handle data storage and user auth; improved device reliability in real-world testing

Software Development Intern — Jun 2022 - Aug 2022
BGC Partners — *New York, NY*

- Developed network diagnostics tools for the credit trading team

Projects

WGPT | *Python, PyTorch* — Jan 2024

- Designed and developed GPT model for conversational language
- Currently training using open-source datasets with plans to deploy the model as an API for demo purposes

Retrieval Augmented Generation | *Python, TensorFlow* — Jan 2024

- Implemented a document retrieval system using a combination of vector and keyword search
- Enhanced LLM performance by integrating document retrieval for context-aware generation
- Used BERT for document embeddings and GPT2 and Gemini for generation

Corrupted Image Reconstruction | *Python, Scikit-learn* — Feb 2024

- Developed a program to reconstruct missing pixels from images using LASSO regression