DAVID HEINEMAN

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EDUCATION

Georgia Institute of Technology Expected May 2024

B.S. in Computer Science

GPA: *3.91,* **Department GPA:** *4.0,* Faculty Honors
Coursework: Low-level Computer Architecture, Information Security, Machine Learning, Database Implementation

Teaching Assistant for Design & Analysis of Algorithms (CS 3510, Fall 2021 & 2022)
Teaching Assistant for Natural Language Processing (CS 4650, Fall 2023)

EXPERIENCE

Data Science Intern | Amazon Web Services, EC2 Summer 2023
- Built prototype LLM application to query AWS documentation, account knowledge to solve root causes of CloudWatch alarms
- Used parameter efficient training (i.e., QLoRA) to fine-tune Falcon, LLaMA to align with developer-friendly responses
- Created first internal deployment of fine-tuned open-source 40B LLM on a Sagemaker endpoint, contributed to bitsandbytes
- **Tools:** *PyTorch, CUDA, HuggingFace TGI, AWS Sagemaker, Docker, Huggingface TRL, internal tools*

Research Assistant | Georgia Tech Natural Language Processing Lab 2022 - Present
- Created a detailed human evaluation scheme for interpreting the efficacy of text simplificaiton models, assisted in developing state-of-the-art neural pre-trained metrics and automatic error detection of model outputs
- Mangaged large-scale training jobs on GPU clusters for diffusion-based text language models
- Implemented efficient lookup algorithms for large n-gram datasets using KenLM to allow for real-time model inference
- **Tools:** *Slurm, PyTorch, NCCL, Vue.js, PostgreSQL, Python*

Software Engineering Intern | Amazon Web Services, CloudWatch Summer 2022
- Developed a new feature for CloudWatch Application Insights to monitor processes running on EC2 instances
- Worked with EC2 Windows experts to identify breakpoints for customers' Microsoft SQL and .NET workloads, predict these common errors using CloudWatch metrics and provide insights to reduce problem resolution time
- Onboarded existing AWS customers like Koch Industries, Moody's to monitor processes on critical Windows workloads
- **Tools:** *Java, TypeScript, React.js, Kubernetes, PowerShell, Lambda, EC2, DynamoDB, internal tools*

Software Engineering Intern | Patientco Summer 2021
- Created a large-scale data ingestion pipeline for training ML models to predict the likelihood of bill payments
- Used AWS Sagemaker to productionalize models to re-train and label *500,000* unique bills daily (*5%* of U.S. healthcare bills)
- Developed a novel sequence-based approach for detecting anomalies in insurance charges, used by providers like Piedmont to identify and fix errors in adjudication for patient bills
- **Tools:** *Tensorflow, Keras, Python, AWS Sagemaker, Horvorod, Docker, SQL, Apache Airflow*

PUBLICATIONS

Thresh: Unified, Customizable and Deployable Fine-Grained Evaluation
David Heineman, Yao Dou, Wei Xu. *preprint*, arxiv.org/abs/2308.06953

Edit-level Simplification Evaluation using SALSA
David Heineman, Yao Dou, Mounica Maddela, Wei Xu. *preprint*, arxiv.org/abs/2305.14458

LENS: A Learnable Evaluation Metric for Text Simplification
Mounica Maddela*, Yao Dou*, **David Heineman**, Wei Xu
Association of Computational Linguistics, 2023

PROJECTS

- **Huggingface Decoding Visualizer** (2023) - Added visualizer of well known language model decoding algorithms (e.g., sampling, beam-search) for any HF model
- **Hashtag Segmentation API** (2022) - Deployed real-time model inference for segmentation. Created interactive Vue app to demonstrate hashtag segmentation
- **Automatic Essay Grader** (2020) - Implemented 12 novel essay grading models and deployed the first real-time essay grader using Tensorflow inference

AWARDS

- President's Undergraduate Research Award (PURA Research Grant)
- Top UserStyles.com Contributor (20,000 Installs)
- 4th Place in Wrek CTF
- Eagle Scout

SKILLS

Languages: Python • C++ • TypeScript • JavaScript • C • Git • SQL • Java

Tools: PyTorch • React • PostgreSQL • D3 • Pandas • NumPy • Horvorod • Flask • TensorFlow • Keras • Apache Airflow • Vue.js • Tailwind • AWS • Microsoft SQL • .NET • Ansible • Docker • Kubernetes • UNIX • Jenkins