Andy Delworth

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Education

Brown University **May 2023**

B.S. Applied Math & Computer Science (Honors), GPA: 4.00/4.00

- Relevant Coursework: Machine Learning, Probability and Statistics, Algorithms
- *Honors thesis* on improving CLIP for classification in low-data settings accepted to NeurIPS 2023.
- Teaching Assistant: Design and Analysis of Algorithms; Introduction to Computer Science

Experience

Hive AI - Machine Learning Engineer I, II **July 2023 - Present**

- ML Model Research & Development
  - Primary developer of a best-in-class model which classifies images as AI-generated or not. Increased average precision from 0.985 to 0.998 by optimizing training augmentations and sourcing new data. The model was evaluated in a 2024 *paper* from UChicago: "Hive is the clear winner among all five detectors, with a 98.03% accuracy, 0% FPR, and 3.17% FNR".
  - Primary developer of deepfake video and image classifiers; clients include the *U.S. Department of Defense*.
  - Primary developer of object detection pipelines, serving major media and entertainment clients. Experimented with modern model architectures, like DINO and DDQ, to improve average precision by 0.5 points while reducing model memory usage by 67% and increasing throughput by 150%.
  - Implemented data oriented techniques to improve model performance, including cleanlab, data augmentation, margin sampling, active learning, vision-language models for data cleaning, and pseudolabeling.
  - Read and present recent machine learning research to colleagues.
- Engineering Accomplishments
  - Optimized model exports to TorchScript and NVIDIA Triton Inference Server; achieved a 250% throughput increase on a deepfake video model by implementing GPU-based video preprocessing, vectorizing operations, and leveraging lower-precision computation.
  - Developed a fullstack video labeling platform to allow coworkers to accurately and efficiently label deepfake videos.
  - Developed tooling to optimize PyTorch Data Distributed Parallel training across our GPU cluster.

Undergraduate Researcher - BATS Lab - Brown University **April 2020 - May 2023**

- Presented paper at NeurIPS 2023 about underexplored benefits of pseudolabels during prompt tuning. Developed novel techniques for semi-supervised and unsupervised prompt learning for vision-language models like CLIP, leading to accuracy improvements of 15% or more across different data availability settings.
- Applied ML algorithms to radiology problems, resulting in two publications (*EBioMedicine* and *The Lancet*).

Meta (Facebook) - Software Engineering Intern **May 2022 - August 2022**

- Improved the Civic Emerging Event Classifier, a weakly-supervised multimodal ML model in the content moderation pipeline, which predicts whether or not a post belongs to one of 60 emerging subtopics.
- Modified SQL-based training data pipeline to create support for information-rich hard negative examples.
- Improved the PRAUC of the model by .03; since the model is run on 3.8 billion content daily, this is significant.

Amazon - Software Development Engineer Intern **May 2021 - August 2021**

- Refactored mission-critical code to allow for scalability by using DynamoDB.
- Created extensible APIs to eliminate a task that required 20 weeks of engineering effort per year.

Technical Skills

- Languages: Python, Java, C, SQL, Scala, OCaml, Racket, TypeScript, JavaScript, and HTML.
- Tools/Libraries: PyTorch, Docker, Bash, HuggingFace, Tensorflow, NumPy, OpenCV, TorchScript, NVIDIA Triton Inference Server, Slurm, Git & Github, scikit-learn, Pandas, AWS, GCP.