Siddharth Gandhi

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Education

Carnegie Mellon University - School of Computer Science **Expected Dec. 2024**
Master of Science in Intelligent Information Systems (Deep Learning) — GPA: 4.04/4.33 *Pittsburgh, PA*
- Coursework: Machine/Deep/Visual Learning, Multimodal ML, Advanced NLP, Search Engines

Vellore Institute of Technology - School of Computer Science & Engineering **July 2023**
Bachelor of Technology in Computer Science & Engineering — GPA: 9.69/10 (Department Rank 3) *Vellore, India*

Experience

Cash Flow Portal (YC W22) **May. 2024 – Aug. 2024**
Software Engineering Intern *Remote*
- Full stack contributions on 2 products: 1) Pallas, a real-estate marketplace and 2) AI-Underwriting for T12 sheets.
- Shipped features in a fast-paced startup environment like implementing new designs, profile insights & ratings, user filters, Slack & email notifications, papertrails of underwriting parsing, and misc optimizations.
- Worked with Python Flask backend, React+JS/TS frontend, and PostgreSQL database with GraphQL.

Carnegie Mellon University **Sept. 2023 – May 2024**
Research Assistant (Advisor: Prof. Jamie Callan) | *github, report* *Pittsburgh, PA*
- Explored neural information retrieval methods to accurately find buggy files in a large Github repo, given a new issue.
- Crawled 1M+ code and commit histories of a diverse set of popular repos, setup a testing suite from scratch and finetuned BERT for a multi-stage reranking pipeline, leading to 2x better retrieval compared to BM25 (P@1, MRR).

Technical University of Munich **June 2022 – Aug. 2022**
Research Intern (Advisor: Dr. Felix Dietrich) | *talk, report* *Munich, Germany*
- Used neural nets learn Stochastic Differential Equations (SDEs) for aerosol cloud growth.
- Created simulated data in Blender, preprocessed with U-Nets, tuned with custom loss function and used Kernel Density Estimation to compensate for class imbalance, achieving 80% lower MSE compared to the baseline.

Technical Projects

Impact of learning inverse mapping in neural nets **May 2024**
- Tried to explore, validate and interpret a novel learning task, $B \rightarrow A$ mapping while learning $A \rightarrow B$, and it's impact on the generalization ability of autoregressive models.

GPT from Scratch | *github* **March 2024**
- Made a 76M GPT-2 style Language Model from scratch, by pretraining it on OpenWebText dataset and supervised finetuning on CNN and Daily Mail, Stanford QA datasets and more.

Deep Learning from Scratch **March 2024**
- Implemented various deep learning methods from scratch in numpy namely - MLP (SGD+Backprop+Batch norm), CNNs (conv/pooling/sampling), GRU with Beam Search, transformers and autograd engine.
- Applied deep learning to several scenarios such as speech recognition (with MLPs, GRUs and encoder-decoder models), image classification/verification (ResNets & ConvNeXts), & image generation (GANs, VAEs, & diffusion models).

QryEval - Search Engine from Scratch **Dec 2023**
- Implemented BM25 & Indri rankers to search over 500K documents, and experimented with various multi-stage reranking pipelines using SVMRank (LTR), BERT & dense rerankers, to achieve 50% higher MAP/P@10 over BM25 baseline.

Refpred - A Literature Recommender *(Bachelor's Thesis)* | *github, report* **July 2023**
- Made a research paper recommender system leveraging semantics and citation history, featuring an async crawler data collection, SPECTER embeddings and neural reranking KNN candidates (+70% F1).

Skills

Languages: Python, C/C++, Javascript | **Databases**: PostgreSQL, MongoDB | **Frameworks**: PyTorch, React, GraphQL, Flask, Numpy, Pandas, Docker, AsyncIO, ExpressJS, Git, HF (transformers, trl), Slurm, W&B

Awards & Achievements

(2019-23) Merit Scholarship & Award: For being consistently ranked in the top 5 of CS Department.

(2022) DAAD WISE Scholarship: One of 130 selected nationally to pursue a fully-funded internship (by the German Government) at the Technical University of Munich, the top-ranked CS institute in Germany.