

# SIDDHARTH GANDHI

✉ ssgandhi602@gmail.com    ≡ ssgandhi.com    in ssgandhi1    🌐 Siddharth-Gandhi

## 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

May. 2024 – Present

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, breadcrumbs on 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.
- Finetuned BERT on commit histories of many popular repos leading to 2x better retrieval compared to BM25.

### 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)

## 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.