



Vikram Thirumalai

[My LinkedIn](#)

[My GitHub](#)

vikram14@live.unc.edu

+1 (201) 554 8285

MSc. Computer Science | 1+ Years of Experience

Aug. 2018 – Dec. 2022

Work Experience

Amazon Music, Software Development Engineer Intern

May. – Aug. 2022

Resume Playlist Listening Experience

- Introduced a feature that resumes a customer's playlist listening experience on Alexa and Amazon Music when "Alexa, Play Music/Playlist" is requested.
- Used **AWS Lambda**, **SQS** and other internal services to set up the infrastructure to generate and store resume points for a customer.
- Improved UPL (user perceived latency) by ~15-20 ms when resuming customer experience by making asynchronous/parallel **RPC** calls to relevant services using the **CompletableFuture API** in **Java**.

Happiest Minds Technologies, Machine Learning Intern

May – Aug. 2021

CCTV surveillance automation and Content Based Image Retrieval

- Created a use-case for **action recognition** models in automating CCTV surveillance. Developed a model using **3D Convolutional Neural Networks** (3D CNN) on **Pytorch**. Achieved 90% accuracy in detecting anomalous behavior from videos. Minimized the processing time per video to 1.5 seconds on a CPU.
- Built a **Content Based Image Retrieval System** to recommend and recover images of similar e-commerce products. System utilized a **Convolutional Autoencoder** backbone for feature extraction coded on Python. Used **ANNOY** to build an index and retrieve images with an 81% top-5-accuracy. Reduced retrieval time per image by 12.5 % on a single-core CPU.

UNC Department of Computer Science, Teaching Assistant

Jan. - Dec 2022.

- Maintained and added front-end and back-end features to a **closure** codebase for a class management website that allows students to take programming tests and assignments online and receive feedback immediately.
- Created **API** endpoints in **closure** to enable different levels of user privilege and used **POSTGRESQL** to manage the data required by the application.
- Collaborated with the Professor to grade, evaluate and assist with creation of homework assignments.

Research Experience

UNC Department of Computer Science, Research Assistant

Oct. 2019.- Dec 2022

Source Code Similarity Detection

- Curated a dataset comprised of programming solutions from university coursework. Implemented a software clustering algorithm using **Normalized Compression Distance** and **Winnowing**, which resulted in a 98% accuracy in clustering student solutions in the dataset. The algorithm's effectiveness in categorizing large volumes of programming solutions reduces need for manual evaluations by 80%+.
- Collaborated with a team of researchers to build an **educational machine learning software** that aids students with assignments by recommending potential solutions to errors gathered from similar past data. Reduced amount manual intervention required by enabling faster debugging of programs.

Personal Projects [\(My GitHub\)](#)

Melanoma Detection

- Conducted a survey on the performance of **CNNs** and **SVMs** on the task of **detecting malignant melanoma** from images of moles. Developed the candidate models using **Pytorch** and **Sklearn**. The CNN out-performed the SVM and achieved an accuracy of 86.52%.

Online Multiplayer Chess

- Built a website that enables users to create an account, view their game history and play chess with friends online. Used **React** and **Semantic UI** on the frontend and **Express**, **MySQL** to develop the **REST API** and database. Facilitated online play with the help of **socket.io**.

Image Segmentation with Graph Cuts

- Developed an interactive program in **Python** that separates the foreground from the background in images using **Graph Cuts** and the **Push-relabel Max-Flow algorithm**. Conducted extensive testing and analysis to optimize the performance of the algorithm by tuning its hyper-parameters.

Education



Master of Science,
Computer Science;
UNC-Chapel Hill;
Jan. 2022-Dec. 2022

Bachelor of Science,
Computer Science (Primary),
Statistics(Secondary);
UNC-Chapel Hill;
Aug 2018-Dec.2021

GRE:330

Dean's List: All semesters

MSc. GPA: 4.0

BSc. Major GPA: 3.91

BSc. CGPA: 3.87

Clubs: Carolina Analytics and
Data Science

Technical Skills



Languages: Java, Python,
C, R, JavaScript, CSS,
HTML, SQL, Octave,
MATLAB, C, Prolog;

Frame Works: MongoDB,
Pytorch, TensorFlow,
React.js;

OS: Windows, Linux;

Other tools: Git, GitHub,
Tableau, AMPL;

Course Work



Operating Systems, Computer
Security, Machine Learning,
Distributed Systems,
Algorithms and Analysis, Web
Programming, Data
Structures, Internet Services
and Protocols.