KARTHICK T. SHARMA

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EDUCATION

UNIVERSITY OF SRI JAYEWARDENEPURA
Dec 2019 - Exp 2024

B.Sc. IN COMPUTER ENGINEERING (HONS), MINOR IN HIGH PERFORMANCE COMPUTING
- Relevant coursework: Data Structures & Algorithm, Data Mining, Natural Language Processing, Intelligent Systems, Parallel Programming and Advanced OS
- Honors: *summa cum laude* (GPA: 3.97/4.00)

EXPERIENCE

WORK EXPERIENCE

CONQORDE SOLUTIONS, UK (REMOTE)
Feb 2022 - Apr 2022

FREELANCE MOBILE APPLICATION DEVELOPER
- Collaborated effectively with project manager to create 'virtual makeup try on' app using **Flutter**, **Unity** and **MediaPipe**.
- Refactored and fixed bugs of legacy code and reduced binary size by **55%**.
- Researched and developed an algorithm using **Python** to calculate Color Correction Matrix (CCM) of phone camera using NLS method (**SciPy**) and optimized true skin tone detection pipeline by **31%**.
- Designed virtual try on for foundation, contact lens and concealer by applying image processing techniques using **OpenCV**.

PROJECTS

QUIZZZY
Source

An AI-powered educational mobile application to automate the process of MCQ generation and evaluation.
- Collected, cleaned and did data preprocessing on SQuAD dataset. Fine-tuned T5 **transformer** to generate factoid questions using **PyTorch lightning** with exact match score of **76.71** and F1 score of **81.33**. (SQuAD metrics)
- Reduced model size up to **30%** and improved inference time by **2.3x** to work on CPU while preserving accuracy.
- Leveraged keyword extraction techniques (RAKE algorithm and keyBERT) to extract answers from the context. Streamlined the process of generating diverse distractors using sense2vec and MMR algorithm.
- Built **RESTful API** using **FastAPI**, containerized back-end using **Docker** and deployed to **Google Cloud Run**. Minimized cold start time by **41%** using various optimization techniques and developed front-end using **Flutter** following **MVC** pattern.
- Wrote automation test scripts and applied GitHub actions for **CI/CD**, which improved productivity of development.

MOCK-BUDDY
Source

An AI-assisted web application that helps people improve their public speaking and presentation skills.
- Created deep learning based **real-time face detector** using ResNet-10 SSD and **OpenCV DNN**.
- Applied data preprocessing and augmentation techniques to 300W dataset. Trained a **CNN** (Convolutional Neural Network) based regression model using **TensorFlow** by applying direct regression approach for **real-time facial landmark detection** with sum of NME of **8.63** and **6.29** for challenging and common datasets (Error metrics for 300W challenge).
- Applied data preprocessing and augmentation techniques to RAVDEES, TESS and SAVEES datasets. Extracted MFCC, Log-Mel features using **Librosa**. Engineered **CNN**-based solution for **speech emotion classification** by applying **bagging** approach using **TensorFlow** with F1 score of **0.97**.
- Implemented speech rate detection algorithm in **Python** utilizing Google's Speech-to-Text. Lowered error rate by **23%** using VAD algorithm.
- Built **RESTful API**s and **WebSockets** using **Flask** and deployed back-end to **Heroku**. Minimized boot time by **12%** through optimizing slug size. Designed front-end using **ReactJS** and **Redux** following MVC pattern and published on **GitHub pages**.
- Increased software development productivity by writing automation test scripts and applying GitHub actions for **CI/CD**.

trAIner
Source

An AI-assisted virtual fitness trainer application which helps users to maintain correct posture while exercising.
- Calculated angles between human joints from camera feed in real-time using **Google's MoveNet**'s prediction.
- Implemented posture detection algorithms in **Kotlin** to count repetitions and alert the user about bad postures.
- Collaborated with peers for improvement of software performance, reviewed their updates and resolved issue.
- Programmed fitness game on **Unity**, integrated with **Android Studio** to create gamified fitness exercises.

OPEN-SOURCE CONTRIBUTIONS

- Docus - A document scanner application which is currently used by 100+ users. Contributed to expand the features by adding flashlight support in **Java**, updated the whole codebase and resolved resulting conflicts.
- Quich - An advanced terminal calculator developed in **C**. Detected segmentation fault and contributed to fix the bug.
- Ivy - A Unified ML framework developed in **Python**. Contributed to add core ML functions. (Filter by author: Karthick47v2)

Skills

Programming Languages	Python │ C++ │ Dart │ Java │ Kotlin │ C# │ JavaScript │ Lua │ MATLAB
Software Development	Problem Resolution │ TDD │ Agile Methodology │ Design Patterns │ GIT │ CI/CD
ML/DL Frameworks & Libraries	TensorFlow │ Keras │ PyTorch │ Scikit-learn │ Gym │ OpenCV │ Librosa
Other Dev frameworks	Flutter │ FastAPI │ Flask │ ReactJS
Database	MySQL │ MongoDB
Languages	*Native:* Tamil *Fluent:* English
Soft skills	Team Leadership │ Team Collaboration │ Presentation
Others	Unity │ Docker │ Google Cloud Platform │ Weka │ Linux

Achievements

RealHack v3.0 | Software Engineering Students' Association, University of Kelaniya *Nov 2021*
Secured 15th place among 600+ teams in problem-solving competition held on HackerRank.

Open Hack 2022 | Mozilla Campus Club of IIT *Oct 2021*
Placed top 10 out of 120+ teams by developing social media application for fitness enthusiasts.

The Battle of Coders | IEEE WIE, University of Kelaniya *Oct 2021*
Became 2nd runner-up in 24-hours Game development hackathon.

CodeSquad v2.0 | Faculty of Computer Engineering, University of Sri Jayewardenepura *Dec 2020*
Secured 6th place among 400+ teams in problem-solving competition held on HackerRank.

CodeFest 2014 (High School) | Faculty of Computing, SLIIT *Dec 2014*
Secured 13th place among 100+ teams in High school category in 2-week game development hackathon.

Extracurricular activity

iGV member | AIESEC in University of Sri Jayewardenepura *Mar 2020 - Jan 2021*
Worked with a team of 4 people on project 'HeartBeat', raising awareness on importance of mental health. Organized awareness, yoga and musical programs with health related NGOs. Designed and distributed pamphlets for the campaign.

Member | Trincomalee District University Students' Association *Jan 2019 - Present*
Responsible for arranging quiz competition for school students, which includes managing a team of 60+ people for getting sponsorship, designing posters, etc., while sticking to the program budget. Participated in organizing car wash, blood donation campaigns. For the year 2019, I served as Vice President of the Media Unit, designing posters for all campaigns and editing photos taken during campaigns. Taught science and mathematics in village schools, which lacked specific teachers.

President | ICT society in T/R.K.M. Sri Koneswara Hindu College *Jan 2014 - Jan 2015*
Managed a team of 8 people to create study sessions for ICT competitions for participants. Controlled and helped to manage audio/visual equipments on school programs. Maintained school website, which was developed using WordPress.

Additional Course

Reinforcement Learning, University of Alberta *(Audited)*
Coursera

Deep Learning Specialization, DeepLearning.AI *(Audited)*
Coursera

Machine Learning, Stanford *(Audited)*
Coursera