KUNAL KOTKAR

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EDUCATION

Masters in Computer Science, JOHNS HOPKINS UNIVERSITY, GPA - 3.84/4 May 2024(Expected)

Bachelors in Computer Engineering, UNIVERSITY OF MUMBAI, GPA - 9.6/10 July 2022

Relevant Courses: Computer Vision, Object Oriented Software Engineering, Data Structures, Advanced Algorithms, Machine Learning, Cloud Computing, Software System Design, Testing and Debugging, Natural Language Processing, Large Language Models

TECHNICAL SKILLS

- **Programming Languages** – Python, Java, C, C#, JavaScript, HTML/CSS, SQL, Kotlin
- **Frameworks and Libraries** – Scikit-learn, Pandas, NumPy, Matplotlib, TQDM, TensorFlow, Selenium, PyTorch, OpenCV, Bootstrap, ReactJS, NodeJs, Docker, Flask, HuggingFace
- **Software Tools** – Azure, MATLAB, Git, Android Studio, AWS (EC2, S3), CVAT, Unity, MongoDB, phpMyAdmin, Firebase, MS Excel

PROFESSIONAL EXPERIENCE

Medical Imaging Research Assistant | HEPIUS LABORATORIES, BALTIMORE Jan 2023 – Present

- Apply experimentally acquired B-mode images of porcine spinal cord before and after injury, benchmark state-of-the-art deep learning models (YOLOv8, Faster RCNN, SSD, DETR, RetinaNET) to localize the site of injury, achieving accuracies as high as **99.5%**.
- Spearheading a project to develop and **automate testing of a novel segmentation model**, enhancing diagnostic precision.

Machine Learning Intern | KNOWLEDGE SOLUTIONS INDIA, PUNE May 2020 – June 2020

- Designed and executed **Regression**, **Random Forest Classifier**, and **K-Means Clustering** (5 clusters), on proprietary datasets to drive data-driven decision-making on a movie recommendation task.
- Implemented an advanced Movie Recommendation System leveraging **K-Nearest Neighbors**, an unsupervised machine learning technique, to enhance user experience and drive engagement.

PROJECTS

LifeSavAR: An AR First Aid Guide | *Unity, Vuforia, Mixed Reality Tooklit (MRTK)* | [GitHub]

- Created an AR application for emergency medical guidance, emphasizing software development and automated testing for real-time assistance.
- Integrated Vuforia and MRTK for overlay on a Torso phantom, enhancing the real-time assistance capability for non-medical users.

Predicting Ejection Fraction using Segmentation guided Video Vision Transformers | *Python, PyTorch, Computer Vision* | [Poster]

- Transitioned the EchoNet-Dynamic and integrated segmentation models with transformers, focusing on software testing to predict cardiac function with high accuracy.
- Accomplished a mAE of **5.81** in predicting Ejection Fraction and secured an AUC score of **91%**.

Apartment Finder - A Web Crawler to Search the Perfect Apartment | *Flask, Selenium, Python, Javascript* | [GitHub]

- Developed an ethical web crawler with **Selenium** to extract data from various websites, presented through a **Flask**-based webpage.
- The system automates multi-site apartment searching, delivering sorted results based on user preferences.

HopCourses - A Course Review Webpage for JHU Students | *MERN* | [Website]

- Developed a dedicated JHU course review platform using the **MERN stack**, integrating a sentiment analyzer for review insights.
- Ensured exclusive access to JHU affiliates through the integration of JHU SSO Login.

Kaaryakhoj - An App for Daily Workers And Employers | *Android Studio, Java, ReactJS* | [GitHub]

- Designed and implemented an Android app with a focus on automated payment and job search functionalities.
- Employed ReactJS to build a web app for employers, providing a **centralized platform** for worker management, payments, and all associated needs, streamlining the process for both parties.

Twitter Sentiment Analysis Platform: Covid-19 Insights| *NodeJS, IBM Cloud*

- Developed a web platform leveraging **Node-Red** and **IBM Watson Services** to analyze sentiment and emotions in tweets on Covid-19 and lockdown from March '20 to Sept '20, offering a snapshot of public sentiment during the period.
- Developed a platform for real-time sentiment analysis, showcasing my ability to manage and implement automated testing solutions.

AWARDS

Joel Dean Excellence in Teaching Award | JOHNS HOPKINS UNIVERSITY April 2024

PUBLICATIONS

"Mime3D - A Patient Monitoring System," ACCAI 2022. Published in IEEE Xplore [paper link]

- Engineered a system integrating **IMU sensors** and the **ESP32S NodeMCU WiFi** module to transmit data through Arduino to a remote server; this was subsequently relayed to a web interface with a **3D human model**, mirroring real-time human motions within Unity.
- Successfully emulated limb movements of volunteers from **Bhabha Atomic Research Center** engaged in sports activities.

"Employee Attrition Using Machine Learning And Depression Analysis," ICICCS 2021. Published in IEEE Xplore [paper link]

- Employed the Goldberg Depression Questionnaire and harnessed a Random Forest Classifier algorithm on a custom dataset to predict employee attrition with **86%** accuracy.
- Designed a user-friendly **Flask-based website** for seamless visualization of the analysis results.