Sudharsanan K

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EDUCATION

Shiv Nadar University Chennai   2022 - present
Bachelor of Technology in Computer Science and Engineering   *Grade: 9.25*
- Senior Core Member of Robotics Club

PROJECTS

Hardware 2FA | *ESP32, SSD1306 OLED Display, DS1302 RTC Module, WebServer*
- A secure hardware-based **TOTP generator** built on **ESP32**, generating **time-based one-time passwords** for enhanced **two-factor authentication**.
- Includes **WiFi** or **RTC synchronization** and an **OLED display** for showing TOTP codes to the user, along with a **web-based configuration interface** for secure access control.
- Features **persistent storage** for settings and **real-time debugging** enabled via **serial monitoring** to assess vulnerabilities.

SSH Server with 2FA and OpenVPN | *Ubuntu, SSH, OpenVPN, Google Authenticator, Router Configuration*
- Set up an **Ubuntu SSH server** on a home network, enabling **remote access** and management.
- Configured **port forwarding** on the home router to allow **secure external access** to the server.
- Implemented **two-factor authentication (2FA)** using **Google Authenticator** for enhanced security during SSH login.
- Deployed an **OpenVPN server** on the same SSH server to establish a **secure and private network connection**.

Smart Eye | *Python, Azure SDK, Google SDK, Raspberry Pi, Embedded Systems*
- Developed a compact system using the **Raspberry Pi** microcomputer to assist **visually impaired individuals** in understanding their surroundings.
- Implemented **image captioning** with **Azure Cognitive Services SDK** to analyze and describe visual content.
- Utilized **Google's Text-to-Speech SDK** to convert image descriptions into **audio output** for user accessibility.

Entity Value Extraction | *Python, OpenCV, PIL, spaCy, EasyOCR, Multiprocessing*
- Extracts entity values like **width**, **height**, **weight**, and **volume** from product images using a custom **NER model** and **Optical Character Recognition (OCR)**.
- Utilizes **OpenCV** and **PIL** for effective image preprocessing, along with **EasyOCR** for accurate text extraction.
- Employs **spaCy** for entity recognition and implements **multiprocessing** with **batch processing** for improved speed and efficiency.

ACHIEVEMENTS AND CERTIFICATIONS

→ Grabbed **Second Position** in a CTF conducted in Invente 2024.
→ Bagged **2nd position** in a **CTF** conducted as part of **Saavan'23 by IITM**.
→ Participated in **8+ CTFs** like **Hack the Box CTF**, **Pragyan CTF**, **Vishwa CTF**, **BITS CTF**, **Password 2024**, **Mapna CTF**, and claimed **notable positions**.
→ **Grabbed 1st Prize** in a **24-hour hackathon** conducted as a part of **Tech Grad 2024**.
→ Ranked **340 overall** in the **Amazon ML Challenge competition** with an **F1 Score of 0.328**.
→ **Finalist** among **100 teams** in the **SIH 2023 internal hackathon**.
→ Conducted **various workshops** on **Arduino and ESP32** as part of the **Robotics Club**.
→ Secured department **second rank** in second semester.
→ Completed a certification in **x86 assembly programming**.
→ Completed a certification in **Embedded System Design with ARM**.

TECHNICAL SKILLS

Languages: Java, Python, C, C++, SQL, HTML, CSS, JavaScript, Bash Scripting, Embedded C, Socket Programming
Frameworks and Tools: Git, Docker, Azure Cloud Platform, Apache Superset, Preset, Tableau, Unity, Wireshark, Nmap, MetaSploit, Pandas, Numpy, OpenCV, Tensorflow
Coursework: Introduction to cybersecurity, Operating Systems, Computer Networks, Distributed Computing, OOPs