Utkarsh Dhagat

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EDUCATION

- **Vellore Institute of Technology, Chennai Campus** — Chennai, India
  Bachelors of Computer Science Engineering, Specialization in AI & Robotics; CGPA: 8.58/10 Sep 2022 - May 2026
  Courses: Embedded Systems,Microprocessor and Microcontroller, Artificial Intelligence,Computer Architecture,Data Structures and Algorithms,Digital System Design,Object Oriented Programming,Operating Systems,Machine learning for robotics

EXPERIENCE

- **Summer Research Intern** — **IISc**
  May 2025 – July 2025 — *Bengaluru, India*
  - **RAG Workflow Optimization**: Architected a high-throughput Retrieval-Augmented Generation system—streamlining document ingestion, FAISS vector indexing, and Ollama-driven LLM QA—wrapped in an intuitive Bootstrap UI.
  - **ChákṣuAI Full-Stack Deployment**: Built a Django platform for patient management, fundus OD/OC & vessel segmentation, lesion detection and automated PDF reporting, deployed via Docker

- **AI Research Intern** — **Samsung Prism**
  Dec 2023 – July 2024 — *Remote*
  - **Dataset Engineering & Model Design**: Developed a diverse audio dataset and designed a U-Net-based model with Convolutional, Residual, and Attention Blocks for feature extraction in audio separation.
  - **Audio Separation & Transformer Integration**: Researched Demucs and BSRNN models, incorporating transformer technology to enhance feature extraction and performance.

- **AI and Robotics Intern** — **StemTec Pvt Ltd (VIT Chennai Incubated)**
  Apr 2024 – Sep 2024 — *Chennai, India*
  - **Autonomous Systems & Leadership**: Developed an Autonomous Ground Vehicle (AGV) using advanced computer vision with RealSense SDK and PyTorch Transformers while leading a dynamic team of five.
  - **ROS2 Integration & Computer Vision**: Integrated and optimized computer vision models into the AGV prototype using ROS2, ensuring seamless functionality and optimal performance.

PROJECTS

- **Edge AI Semantic Segmentation**: Developed and deployed a real-time semantic segmentation pipeline on NVIDIA Jetson devices, including custom model training, dataset preparation, and TensorRT-optimized inference for embedded computer vision applications. **GitHub**. Tech: Python, PyTorch, TensorRT, NVIDIA Jetson, OpenCV

- **Ollash (t2\$sh CLI)**: Designed a CLI assistant that converts natural language to safe, POSIX-compliant shell commands using local LLMs via Ollama. Supports interactive REPL, history-aware retrieval with Interro, and GGUF/Hugging Face model integration. **Website** Tech: Python, Ollama, Interro, Docker, CLI

- **MRIG - Medical Report Generation**: Utilized ResNet50 CNN architecture and developed algorithms to extract critical parameters from chest X-rays, enhancing medical diagnostics. **GitHub**. Tech: Python, TensorFlow, CNN

- **Robotic Arm Simulation and Control**: Developed and simulated a 4-DOF robotic arm with gripper in ROS Noetic and Gazebo, enabling interactive control via Python nodes. **GitHub**. Tech: ROS, Gazebo, Python

- **VitaFile - EHR Management System**: Led frontend development, integrating Google APIs for centralized EHR access and enhancing user experience with multilingual support, voice interaction, and gesture recognition. **GitHub**. Tech: Python, Google APIs, React, Django

RESEARCH

- **Audio-Visual Source Separation** — Published in *PLOS ONE* [link]
  March 2023 - September 2024
  - **Model Development**: Developed an advanced source separation model leveraging Dual Multimodal Residual Network (DMRN) and Audio-Guided Visual Maps to generate heatmaps for video frames, enabling precise audio source localization.
  - **User Experience Optimization**: Enabled individual control over the volume of each audio source, allowing selective amplification or attenuation of specific sounds within a video frame, significantly improving user experience in multi-speaker environments.

POSITIONS OF RESPONSIBILITY

- **Linux Club** — Cybersecurity Lead
  Aug 2023 - Feb 2024 — *Chennai, India*
  - Led cybersecurity department (seminars, workshops, CTFs) and built a Linux-first, open-source community by recruiting and mentoring members.

SKILLS SUMMARY

- **Languages**: Python, C, C++, Java, HTML5, CSS3, JavaScript, SQL
- **Frameworks**: Pytorch, Tensorflow, CUDA, Docker, ReactJS, Django, Vue.js, FastAPI, ROS2
- **Tools**: Git, MATLAB, Keil uVision, LTspice
- **Spoken Languages**: English (Full Proficiency), Hindi (Native)