SHUBHAM SOMNATH SAHOO

Deep Learning Engineer ⋄ Website ⋄ Github

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EDUCATION

Indian Institute of Technology Kharagpur | July 2017 - May 2022   CGPA
Electronics and Electrical Communication Engineering | Dual Degree   *8.65/10.0*
Visual Information Processing and Embedded Systems - M.Tech Specialisation
Computer Science and Engineering - Minor

SKILLS AND EXPERTISE

AI/ML	Deep Learning (CNNs, Transformers, Multi-modal Diffusion Models), Computer Vision
Programming & ML Frameworks	Python, C++, CUDA, Pytorch, OpenCV/Kornia, FastAPI, Onnx/TensorRT
Generative AI Models and Tools	Stable Diffusion XL (Diffusers), ComfyUI, Segment Anything(Meta AI)
MLOps & DevOps	Kubernetes(GCP/Azure), Docker, Agentic CI/CD Pipelines(Goose AI), Kafka, Redis

WORK EXPERIENCE

Deep Learning Research Engineer | NeuroPixel.AI Labs   Dec 2023 − Present
- Implemented flat-lay to model image translation with **FitDiT**, refined apparel masks to improve garment alignment and realism.
- Optimized Meta's **Segment Anything (SAM)** model to **TensorRT** format for faster inference(**2.69x**) and real time segmentation.
- Built a **preemptive Redis queue** to prioritize batch and real-time image generation requests by time, size and urgency.
- Automated end-to-end CI/CD workflows using agentic AI with **Goose AI**, enabling modular and scalable deployment pipelines.

Software Engineer | Analog Devices India Pvt. Ltd.   May 2022 − Nov 2023
- Reduced the **speech miss rate** to **0.121%** (at 72kmph) with **MIPS** value of **13** for Voice Activity Detection inside vehicles
- Led the deployment of non-contiguous memory allocation techniques, managing memory fragmentation and resource-constraints
- Integrated **Dolby Atmos In-Car Experience** decoder inside a synchronous network using **DMA interrupts** and **GPIO**

Internship | RPAD Lab, Carnegie Mellon University   June 2020 − August 2020
- Worked on Safety Envelope Tracking using **self-supervised** reward function and **Graph Convolutional Neural Networks**
- Devised an approach to use the temporal knowledge from the environment by clustering points and greedy matching between frames
- Obtained over 80% accuracy with CNNs on the prediction of residual policies and optimized the velocity baseline with ICP matching

Robotics Intern | AMX Innovation, Bengaluru   May 2019 − July 2019
- Improved and trained the detection model on aerial views by using transfer learning on **Yolo V3-tiny** object detection model
- Used object avoidance planner for manoeuvring the UAV from the ground station and integrated the code with ROS

PROJECTS

Autonomous Ground Vehicle Research Group   IIT Kharagpur
- Built Eklavya 7.0, a self-driving robot which autonomously navigates to the desired GPS waypoints through lanes by avoiding the obstacles.Worked on motion controls and electronic architecture of Eklavya 7.0, also tuned **EKF** based localization **(Report)(Video)**
- Devised a novel method to stabilize Bias and remove Noise from an Inertial sensor-based wheel encoder using **Kalman Filter**

Operating Systems   IIT Kharagpur
- Designed Multilevel Feedback Queue Scheduling in PintOS(80x86 architecture) to avoid busy waiting and improve fairness/performance
- Implemented a robust multiple producer-consumer system having prioritized jobs using **shared memory** to avoid deadlocks**(Link)**

Semester Term Projects   IIT Kharagpur
- Optimised the node centric version of the **Betweeness centrality** on large graphs in GPU using **C++/CUDA** optimizations
- Developed the RGB color space model for Region Filling and Object Removal by Exemplar-Based Image Inpainting technique

PUBLICATIONS

- Preeti Samhita Pati, Shubham Somnath Sahoo, Dilip Krishnaswamy and Raja Datta "A Novel Machine Learning Approach for Link Adaptation in 5G Wireless Networks", DOI: 10.1109/PhDEDITS51180.2020.9315299
- "A Prototype of an Intelligent Ground Vehicle for Constrained Environment: Design and Development", **IEEE** International Conference on Control and Robot Technology − 2019 DOI: 10.1145/3387304.3387321

COMPETITIONS AND ACHIEVEMENTS

- Secured 2nd Position among 43 international teams at Intelligent Ground Vehicle competition (IGVC),**Oakland University, USA**.
- Won second prize in deploying the attention based algorithm's code on **Xilinx FPGA** board(PYNQ-Z2) with **CAN** based protocol.

EXTRA-CURRICULAR ACTIVITIES

- Awarded Honourable Mention for Sports and Games by Technology Students' Gymkhana, IIT Kharagpur
- Won **Silver medal** in the event of Volleyball in the **54th Inter-IIT Sports Meet 2019-20** held at IIT Bhubaneshwar