

ADITHYA NARAYAN

Bangalore, India 560102

☎ +91 9562470818 ✉ adithya.narayan943@gmail.com 🌐 github.com/Alphaepsiolon

Education

Manipal Institute Of Technology

July 2017 – July 2021

B.Tech in Electronics and Communication; Minor in Computational Mathematics

Manipal, Karnataka

Overall GPA: 8.92 (out of 10)

Technical Skills

Languages: Python, C++, C, Java, Bash

Frameworks/Packages: PyTorch, TensorRT, OpenCV, Tensorflow, Keras, Pandas, Docker, Numpy, SciPy, Scikit

Relevant Coursework

Relevant Coursework: Computational Linear Algebra, Computational Probability, Computer Vision

Honors: Merit Award,

Professional Experience

Arintra

March 2023 – Present

Machine Learning Engineer

Bangalore, India

- Adapted and deployed **Large Language Models (LLMs)** for **named entity recognition (NER)**, **entity linking (EL)** and **relationship extraction (RE)** improving coding accuracy by 10% over the existing system.
- Worked with **Databricks**, **PySpark** and **MLFlow** to handle the model development lifecycle. Overall, this increased the number of tasks covered per development lifecycle by **15%**.
- Managed the entire **data lifecycle** by developing an in-house **data management system** allowing for users to annotate data (LabelStudio), store data in a **data lake (PostGRESQL)** and perform effective data versioning.
- Handled the design of the company's **micro-service architecture** for **model serving**. Used tools like **SpringBoot**, **FastAPI**, and **gunicorn** to create an efficient, multi-threaded, inference engine.

Klothed

February 2022 – March 2023

Machine Learning Engineer

New York, USA

- Improved user engagement with virtual tryons by implementing an approach that used **Stable Diffusion** models along with **ECON:Explicit Clothed humans Optimized via Normal integration** to recover 3D human meshes and synthesize novel view textures from a single, front-facing image. Also explored 3D mesh recovery from novel views synthesized by **PixelNeRF** as an alternative.
- Designed a **custom semi-supervised GAN**, inspired by **SN-PatchGAN**, for clothing reshaping across various body shapes. Implemented an **inpainting model** with **optical flow fields derived from SMPL-X** body-fits to intelligently predict fabric folding and shape adjustments.
- Researched, optimized (**Torch TensorRT**, **Quantization**) and deployed (**Docker**, **GCP**) multiple **super-resolution** networks written in **PyTorch** to improve the user experience of **virtual-tryons** on dekstop. Created **synthetic data** by degrading images using pipeline specific image degradations, similar to the work done in Real-ESRGAN.
- Implemented **Style-GAN2 priors** for improving face super-resolution. Later also explored **StyleGAN-Human** based priors to improve the super-resolution model for human bodies as a whole.
- Improved 2D fabric simulation using **finite-element (FEM) techniques** in **SciPy** and **NumPy** to both improve product speed (**2s down to 0.2s**) and improve the visual quality of clothing body-fits.

Origin Health

August 2021 – November 2021

Research Engineer

Raffles Quay, Singapore

- Led a **team of 5** to tackle anomaly detection the transventricular plane of a fetal ultrasound. **Managed** and implemented processes for **data acquisition**, defined **research objectives**, and facilitated **product deployment**.
- Co-authored** a research paper aimed at enhancing **fetal biometry measurement** by 4%. The methodology employed a **key-point detector** inspired by the **U-Net architecture**, integrating a **heatmap-based attention mask** into the loss function.
- Proposed and deployed an **artifact removal pipeline** that used **image inpainting (Context Encoder GAN; GLCIC)** and **de-noising (DRUNET)** models.
- Designed explainability (**Grad-CAMS**) frameworks and robust model evaluation frameworks (**ICC**, **Bland Altman**) in **Python (Pandas,SciPy)** to compare the relative performance of the model against doctors.

Internships/Projects

Origin Health

November 2020 – August 2021

Research Intern

Raffles Quay, Singapore

- Researched and published work on an end-to-end anomaly detection framework using **image segmentation (UNet)** and **classification (MLPs)** networks (**Tensorflow-Keras, Scikit**). Designed custom **domain-specific data augmentations** to achieve a **2% performance improvement** (dice 0.82).
- Developed a scalable data pipeline utilizing OCR (**Tesseract/CTPN**) on doctor's reports to scrape training data for relevant anatomies (**Regex, Pandas**).
- Wrote custom operators in **C++** and worked on the deployment (**Torch-TensorRT**) of multiple deep learning models.

HPC Lab, IIT Bombay

May 2019 – July 2019

Intern

Maharashtra, India

- Implemented **Monocular Visual Odometry** from scratch using **OpenCV-Python** using a combination of **Shi-Tomasi corner detection** and the **Lucas-Kanade method** to track key-points across frames.
- Additionally, **Neister's five point algorithm** was used to compute the Essential Matrix and estimate the pose and trajectory of the camera
- Worked on using **Open3D** and **ORB-SLAM** to generate **sparse 3D-reconstructions** of the environment. To utilize this, also worked on the hardware components; using a **monocular RGB camera** along with a **Raspberry-PI** to build a four-wheeled robot.

Manipal Institute Of Technology

March 2019 – May 2019

Project

Karnataka, India

- Worked on a project dedicated to building a **VR tool for neurosurgical planning in Unity3D**.
- Processed over **100k MRI images using OpenCV-Python** and generated **3D meshes using 3D Slicer** to annotate and model cancerous brain tissue. This image data was then used to train a **U-Net** based image segmentation model.
- Modelled user-object interactions in **VR** using Unity and the **Oculus Rift SDK**. Additionally, worked on **interpolating textures** on cut faces using **fan interpolation**.

Extracurriculars

Robotics And Circuits Club

2018 - 2021

- Played a key role as a member of the organizing committee for various technical events and hackathons hosted by the robotics club.
- Taught the fundamentals of coding in **Python** to underprivileged students as part of the club's STEM outreach program.

Publications/Presentations

SPIE | *Publication*

April 2022

- Lad, A., Narayan, A., Shankar, H., Jain, S., Vyas, P. P., Singh, D., ... & Devalla, S. K. (2022, April). Towards a device-independent deep learning approach for the automated segmentation of sonographic fetal brain structures: a multi-center and multi-device validation. In *Medical Imaging 2022: Computer-Aided Diagnosis* (Vol. 12033, pp. 934-944). SPIE.

ISBI | *Publication*

March 2022

- Shankar, H., Narayan, A., Jain, S., Singh, D., Vyas, P., Hegde, N., ... & Devalla, S. (2022, March). Leveraging Clinically Relevant Biometric Constraints to Supervise a Deep Learning Model for the Accurate Caliper Placement to Obtain Sonographic Measurements of the Fetal Brain. In *2022 IEEE 19th International Symposium on Biomedical Imaging (ISBI)* (pp. 1-5). IEEE.

ISUOG | *Oral Presentation*

October 2021

- Narayan, A., Kaushik, S., Shankar, H., Jain, S., Hegde, N., Vyas, P., Atada, J., Manjushree, S.P., Thang, J., Saw, S., Govindarajan, A., Roopa, P.S., Pai, M.V., Vasudeva, A., Radhakrishnan, P. and Devalla, S. (2021), OC11.02: A multicentre, multi-device validation of a deep learning system for the automated segmentation of fetal brain structures from two-dimensional ultrasound images. *Ultrasound Obstet Gynecol*, 58: 33-33. <https://doi.org/10.1002/uog.23853>

ISUOG | *Poster Presentation*

October 2021

- Shankar, H., Narayan, A., Kaushik, S., Jain, S., Hegde, N., Vyas, P., Atada, J., Manjushree, S.P., Thang, J., Saw, S., Govindarajan, A., Roopa, P.S., Pai, M.V., Vasudeva, A., Radhakrishnan, P. and Devalla, S. (2021), VP18.02: A deep learning system for the automated calliper placement to measure multiple fetal brain structures from two-dimensional ultrasound images. *Ultrasound Obstet Gynecol*, 58: 172-172. <https://doi.org/10.1002/uog.24298>