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Education

- **National Institute of Technology, Calicut** — Kerala, India
  B.Tech Mechanical Engineering; GPA: 6.52/10.0 — *Jun.2015 – May. 2019*
- **IGNOU - Distance Education/Online Degree** — India
  Master of Arts in Philosophy — *Oct.2020 – Present*
- **Central University of Hyderabad - Online Degree** — India
  Diploma in AI and ML — *Feb 2021 – Present*

Experience

- **New Space Research Technologies** — Bangalore, India
  Machine Learning Engineer II — *Feb 2021 - Present*
  - **Autonomous Systems Team - Ongoing**: Working as a part of Autonomous team to research and upgrade the vision capabilities for core projects the team is currently dealing with. Currently working on Feature matching and tracking for Autonomous systems navigation.
- **Quantiphi Analytics Solutions** — Bangalore, India
  Machine Learning Engineer — *May 2019 - Feb 2021*
  - **Solutions Research Team**: Working in a team to develop firms capability in Hybrid deployment scenarios especially edge inference/cloud inference using Nvidia SDK such as Deep Stream, Transfer learning toolkit,Clara, Tensorflow Lite deployments, Intel Open Vino Optimizations and also Using different Cloud APIs such as GCP Vision, Video Intelligence, Amazon Rekognition to provide custom serverless solutions.
  - **Translation Application for WebPage/Doc translation**: This project involves building a application which can provide website and document translation services to the client. Some of the technologies used are Lambda Functions, Google Translate, Vision, Document Parser API, Kubernetes. My work is to build a scalable architecture for developing a secure web application which will be used by the client.
  - **NLP- Transformer related script development**: This project involves developing a scalable script to deploy OpenGPT-2/Roberta/Longformer in a kubeflow based pipeline and to benchmark the model performance.
  - **Computer Vision for Person Re-Identification**: Computer vision pipeline for Re-identification and security. This involves working on different deep learning models such as MobileNet, EfficientDet for Object Detection, DeepSort, CenterTrack for Object Tracking, Generative and conventional CNN architectures for Person Reidentification. Training models on GPU using Distributed and acclerated approaches using Cloud Engines. Other components of the pipeline include working on Embedding search techniques on CPU and GPU such as Elastic Search, FAISS etc. Entire Pipeline is built on GCP with Kubernetes and PubSub Tech Stack and all Machine learning models are hosted on Triton Inference Server with a interactive UI Platform for real time entity search.
  - **Computer Vision for Safety**: Computer Vision Pipeline for Safety in Parks,Resorts etc. This involves working on deep learning models such as SSD, YoloV3 for Object Detection, PoseNet,OpenPif-Paf for Pose Estimation, Mobilenet based Image Classification, Object Tracking and all the machine learning models are hosted on Trition GPU Inference Server. Platform is built using Kubernetes, PubSub,Datastore, GCS etc.Projects main aim is to provide real time alerts to the security officials for ensuring Safety and minimising risks in Parks/Resorts.
- **Storilabs System Technologies** — Kerala, India
  Machine Learning Intern — *Jun 2018-Oct 2018*
  - **Computer Vision Pipeline for realtime Object Search**: CV Pipeline for Real time object search is for identifying and live tracking of objects across multiple places and also tracking the history. Project involves working on Object Detection models such as Yolo-v3, SSD Mobilenet etc which were deployed on a GPU server. And the live feed for analysis involves hosting a nginx server and automation script on Raspberry Pi-3B with RGB Camera. Enitre Pipeline is a hybrid combination of Cloud and Edge Technologies with a UI developed on PHP,HTML.

Projects

- **Project-VIRTUA (Ongoing)**: Development of RL based Virtual Simulations for decision thinking in mission critical solutions and to develop interfaces to connect it to the real world with more focus towards AGI based Virtual Simulations.
- **Autonomous Bot-v1 using DL and ROS(Ongoing)**: Development of an Autonomous bot using ROS, Object De-tection, Lane Detection and path planning using Jetson Nano, RPI4 with night vision system implemented.
- **Auto RC Car using Tiny ML (Ongoing)**: Integrating RC Car (1:10) with vision and sensory models and using Tiny ML for low powered micro-controllers to understand capability of edge computing.
- **Robo DJ(ongoing)**: DJ with Deep Learning using Audio and vision based architectures. Under literature review for getting domain knowledge for hybrid implementation.
- **Knee Rehabilitation System**: Fabrication of a device with 2 DOF mechanism which can be used for performing Flexo-extension exercises which can be used for Knee rehabilitation purposes.
- **RIGGU V2-The Semi Humanoid** : Complete framework for the development of an Interactive Semi-Humanoid Robot using technologieslike AI,NLP,ROS,SLAM.
- **Alexa SkillSet Dev**: Worked on developing a Alexa skill set for Interactions related to Financial transactions.
- **Quadcopter**: Autonomous Quadcopter based on PixHawk Flight controller integrated with a Raspberry Pi
- **Hexacopter**: Hexacopter based on ARM and equipped with manual control. PID tuning was done for the stability. This project involves the testing and performance analysis of hexacopter on PID and backstep algorithms.
- **GUI For Library Automation** : This project involved working on python and tkinter to develop a basic graphical interface for automation systems.This was tested with a library automation system.
- **Four wheel steering system** : Mechanism to orient the four wheels in such a way to enable the automobile to take a sharp turn with minimum radius of curvature.
- **RIGGU**: Interactive Robot with Speech and Image Processing capabilities.
- **Robocon Bot**: A manual bot which can throw disks at specified positions which was made by our Robotics Interest Group for National level Robotics Competition called Robocon-2017.
- **GSM-GPS Guided Bot**: A four wheel mobile robot which can move from one specified location to another with the help of GPS and GSM modules.

Publications

- **RIGGU: A Semi-Humanoid Robot Platform for Speech and Image Recognition**:
  RIGGU is a semi-humanoid interactive robot that is developed for different applications such as hospitality, treating autism, and assisting aged people. This paper proposes the integration of object, face, emotion recognition, and navigation of a semi-humanoid robot platform using the Robot Operating System (ROS).

Programming Skills

- **Languages**: Python, C, C++, SQL, HTML, R
- **Technologies**: Cloud Computing(GCP,AWS,Azure), AI ML, Robotics, Edge Computing,Speech Tech, IOT, Network Security
- **Frameworks**: Tensorflow,OpenCV, Scikit-Learn, Pytorch, CUDA, cuDNN, ROS, ML-Agents, Gym, StableBaselines, IOT Core, TFLite, TFJS
- **Softwares**: Matlab,COMSOL,SolidWorks,Ansys,FluidSim, CREO, MasterCam, Proteus
- **OpenSource**: Octave, Arduino, Edge Devices, GitHub, Jenkins
- **Other**: Leadership, Research, Public Speaking, Strategic Planning, Project Management,MS Office

Research Interests

- Artificial Intelligence,Robotics, Advanced Drone Systems, Human-Computer Interaction, Quantum Physics, Quantum Computing, Defence Systems, Neuroscience, Quantum Information and Consciousness, Space and Cosmology

Certifications/Courses

- **Coursera**: Machine Learning by Andrew Ng
- **Coursera**: Deep Learning Specialization by Deeplearning.ai
- **Coursera**: Tensorflow Data and Deployment Specialization by DeepLearning.ai
- **CloudTech**: AWS Machine Learning Speciality
- **CloudTech**: GCP Cloud Associate Engineer
- **CloudTech**: AWS Associate Solutions Architect
- **Electives/Courses**: Control Systems, Intro to Robotics, Image Processing, Dynamics, Neural networks and Genetic algorithms
- **Others**: Intro to AWS ML, Intro to Nutanix Cloud by Udacity, Nvidia Datascience with RAPIDS.
- **Udacity**: Self Driving Engineer Nanodegree - Ongoing
- **Udacity**: Robotics Software Engineer Nanodegree - Ongoing
- **Qubit by Qubit**: Intro to Quantum computing Degree - Ongoing

Activities

- **Robotics Interest Group Member (2016-2019)**:
  • Participated in National Level Robotics Competition with team of 20 Members.
  Role Played: Mechanical design and fabrication of manually controlled Robot.
  • Volunteered workshops on Basic Introduction to Robotics to college juniors.
  Role Played: Explained the software and gave introduction to Pneumatics,various field of robotics and explained how to code a Line following robot and Obstacle Detection Robot.
- **Yatri at Jagriti Yatra 2019**:
  • An exciting journey around 12 different places in India, connecting with 450 people from different parts of world. Meeting people who are doing exceptionally well in the fields of social welfare, Sustainable Product development, Technology, Rural development etc.

Community Outreach

- Participant : 5 Day Workshop on Quantum computing
- Speaker : Handled a session on Neuroscience and Artificial Intelligence in a GDG Meetup
- Speaker : Conducted Introductory Workshop on Robotics and AI to Rural IT people as a part of India Literacy Program
- Participant : NiTCkathon.Ai which is an AI based hackathon conducted by JMR Infotech.
- Participant : India design Contest conducted by DST, Texas Instruments,Startup India.
- Attendee : Short-term programme on Research Methodology in Science, Energy and Management.
- Attendee : Full day session on Startup and IPR Awareness Program.
- Attendee : Seminar on Innovations in Space Technology