

# Sivaji Retta

AI Research Engineer

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## Profile

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Passionate AI Research Engineer specializing in Computer Vision. Driven to develop innovative solutions that push the boundaries of visual perception through artificial intelligence. Equipped with strong technical skills and a deep understanding of cutting-edge AI and CV algorithms. Dedicated to pioneering research that solves complex challenges and revolutionizes the field. Excited to collaborate with like-minded professionals, share knowledge, and contribute to groundbreaking advancements in AI and Computer Vision.

## Research Interests

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Machine Learning - Deep Learning - Computer Vision - Image Processing - NLP - Time Series Analysis

## Professional Experience

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**Visiting Researcher,** (*Singapore University of Technology and Design*) **Singapore** 01/2024 - present

- Developed SLiMe, a few-shot segmentation model tailored for cattle segmentation, facilitating automatic annotation of keypoints by utilizing part-wise segments of the cattle..
- Implemented YOLOv8 multitask model, integrating detection, segmentation, and pose estimation into a unified architecture instead of separate models.
- Investigated Vision Mamba for detecting abnormalities in chest X-rays and explored its interpretability, comparing its performance with existing models.
- Submitted three papers based on the aforementioned works to the ICME 2024 industrial track.

**AI Research Engineer,** (*AnimalEYEQ*) **Singapore** 10/2022 - 01/2024

- Enhanced animal counting methodologies by integrating detection and tracking models.
- Implemented YOLO and FPN models for animal detection and segmentation.
- Achieved notable performance improvements utilizing YOLOv5 and YOLOv8 architectures.
- Led a project on pig weight estimation leveraging segmentation outcomes.
- Published research papers on livestock management at IEEE VCIP, IEEE ISM, and SPIE ICMV in 2023.
- Engaged in ongoing patent work with upcoming patents in progress.

**Machine Learning Engineer,** (*Quantiphi Analytics Solutions*) **Mumbai, India** 05/2021 - 09/2022

- Successfully completed a Proof of Concept (POC) for Image Stitching in the Madison Square Garden (MSG) project.
- Developed a versatile pipeline for internal use, facilitating the deployment of computer vision models such as object detection.
- Implemented Synthetic to Real Image generation using CycleGAN models, enhancing data augmentation capabilities.
- Significantly improved the frame-per-second (FPS) rate of the face detection model by 2.5 times its previous performance. This feat was accomplished through the implementation of the RetinaFace (mobilenet 0.25) model and batching techniques.

## Research Papers

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- mtYOLO: A multi-task model to concurrently obtain the vital characteristics of individuals or animals, Kian Eng Ong, Sivaji Retta, Ramarajulu Srinivasan, Shawn, Jun Liu, IEEE ICME 2024
- CattleEYEVew: A Multi-Task Dataset for Smarter Precision Livestock Farming, Sivaji Retta, Kian Eng Ong, Ramarajulu Srinivasan, Shawn Tan, Jun Liu, 13th IEEE International Conference on Visual Communications and Image Processing, 2023.
- Towards Imperceptible Adversarial Image Generation: Minimizing Perceptual Difference, Sivaji Retta, Ramarajulu Srinivasan, 25th IEEE International Symposium on Multimedia, 2023.
- CattleDeSegNet: A Joint Approach to Cattle Denoising and Interpretable Segmentation, Sivaji Retta, Ramarajulu Srinivasan, Rama, 16th SPIE International Conference on Machine Vision, 2023.

- Comprehensive Analysis of Deep Learning Approaches for PM2.5 Forecasting, Sivaji Retta, Pavan Yarramsetty, Shivalal Kethavath, Proceedings of the 3rd International Conference on Computational Intelligence and Data Engineering, 2021

## Internships

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### Research Intern (*Indian Institute of Technology, Hyderabad*)

Hyderabad Feb 2020 - Mar 2020

- Supervision: Prof. C. Krishna Mohan and PhD student K Naveen Kumar
- Lab: Visual Learning and Intelligence Lab, IIT Hyderabad
- Investigated Vehicle Detection and Classification in challenging weather and lighting conditions.
- Utilized the YOLOV3 object detection model.
- Enhanced performance with the integration of FastDVDNet, a video denoising algorithm.
- Notable Outcome: Significantly improved detection confidence, especially in adverse conditions, by incorporating FastDVDNet into the process.

### Research Intern (*National Institute of Technology, Rourkela*)

Rourkela May 2019 - July 2019

- Supervisor: Dr. Santos Kumar Das
- Lab: Intelligent Surveillance and Data Retriever Lab, National Institute of Technology, Rourkela
- Project: "Development of Wireless-based Intelligent Security and Surveillance Systems"
- Developed and implemented a live location tracking system based on Raspberry Pi.
- Focused on enhancing security and surveillance using wireless technology.
- Conducted face detection, object detection, and vehicle detection using pretrained models on both Nvidia Jetson Nano and Raspberry Pi platforms.

## Education

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### RGUKT-IIIT, Nuzvid, India

2017-2021

Bachelor of Technology, Electronics and Communications Engineering

CGPA: 8.57/10

**Relevant Coursework:** Engineering Mathematics, Signals and Systems, Digital Signal Processing, Digital Image Processing, Artificial Intelligence, Machine Learning, Medical Image Analysis, Embedded Systems

### RGUKT-IIIT, Nuzvid, India

2015-2017

Pre University Course, Mathematics, Physics, Chemistry, Information Technology

CGPA: 9.69/10

## Hackathons and Academic Achievements

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- **Open Innovation Hackathon, KL University, India** 2017, Winner  
Awarded for Building Smart Villages in collaboration with Andhra Pradesh Innovation Society and UC Berkeley.
- **Pravega Innovation Summit, IISc Bangalore, India** 2019, Finalist  
Designed a live location tracking wristband, ranking among the top 8 finalists at the National Level Pravega Innovation Summit.
- **SUS INNOHACK Hackathon, RGUKT Nuzvid, India** 2019, Winner  
Received a winning prize of Rs. 25,000 at the hackathon organized by Rajiv Gandhi University of Knowledge Technologies and INIAC.
- **Fiction2Science Hackathon, Continental, Bangalore, India** 2019, Finalist  
Recognized as one of the top 8 innovative teams for developing a Deep Learning model for pre-crash detection.
- **Sankalp Semiconductor Hackathon, Kolkata, India** 2020, Finalist  
Designed a workflow for Automated and Decentralized Pollution Monitoring and Forecasting using IoT and ML, winning the competition.
- Awarded a fully-funded six-year Integrated Program, encompassing Pre-University Course and Bachelor of Technology, as one of the top 5% of rural secondary school graduates in India.
- Awarded Merit Scholarship during Secondary education.

## Online Courses

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- Deep Learning Specialization by Andrew NG - Coursera
- Introduction to Internet of Things and Embedded Systems - Coursera

## Skills

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- **Programming Languages:** Python, Fundamentals of MATLAB and C.
- **Operating Systems:** Windows, Linux.
- **Tools/Frameworks:** Familiarity with NumPy, OpenCV, Pandas, Scikit-Learn, Matplotlib, Keras, and TensorFlow, Pytorch.

## Student Leadership and Volunteer Experience

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- Student Development and Campus Activity Cell (SDCAC) (Organizer) 2017 - 2018  
Led the organization of technical fests, project showcases, and hackathons, fostering a vibrant technical culture on campus.
- Helping Hands (Volunteer) 2016 - 2017  
Initiated weekly fund collections to support needy students on campus, providing financial assistance for various educational needs.
- National Service Scheme (NSS) (Volunteer) 2017 - 2019  
Participated in health camps and village cleaning drives, contributing to the welfare of underprivileged communities across India.

## Languages

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- **Telugu** [Native]
- **Hindi** [Basic]
- **English** [Professional proficiency in English (10 years of education in English medium, complemented by practical experience in professional settings)]