ASHWANI KUMAR SINHA

AI-ANALYST@ALSTOM/ IMAGE ANALYTICS/ AERIAL ROBOTICS

CONTACT

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WWW: Bold Profile

EDUCATION

July 2022
Master of Engineering: CSE
Madras Institute of Technology, Anna University, Chennai
- GPA: 84%

August 2020
B.TECH: CSE
SRM Institute of Science And Technology, Chennai
- GPA: 84.51%

July 2016
CBSE - 12th: PCM
Gurukul Vidhyapeeth, Hajipur
- Total : 87%

May 2014
CBSE - 10th
B.D.Public School, Hajipur
CGPA: 10

PROFESSIONAL SUMMARY

AI and Robotics Analyst with 3+ years of experience at Alstom, focusing on computer vision and robotics solutions for the rail and mobility sector. Skilled in machine learning, deep learning, and cross-functional collaboration, with a passion for leveraging technology to deliver innovative, sustainable mobility solutions.

SKILLS

Computer Vision	Machine learning
Image processing techniques	Object detection methods
3D computer vision	Deep learning algorithms
Machine learning frameworks	Robotics integration
CUDA acceleration	ONNX / TensorRT
GPU Optimization	Docker

WORK EXPERIENCE

2022 - Current
AI Analyst, ***Alstom***, Bangalore

- **Depth Analysis and Thickness Measurement using 2D-Camera for Brakepad using Image Segmentation and Profiling**.
- Developed an automated pipeline for BrakePad detection and profiling using a hybrid approach combining deep learning (UNet with VGG-16) and traditional image processing.
- Implemented image segmentation to isolate BrakePad regions from RGB input images.
- Designed algorithms for Contour Detection, Contour Outlining, and Orientation Correction to standardize BrakePad alignment.
- Engineered a profiling method to calculate BrakePad thickness using pixel-based distance measurements and trigonometric transformations.
- Converted linear pixel distances to angular measurements for precise profiling.
- Integrated reference object mapping to convert pixel dimensions to

WEBSITES, PORTFOLIOS, PROFILES

- https://www.linkedin.com/in/ashwani-kumar-sinha-400b7a121

PERSONAL DETAILS

Date of Birth: 28. August 1998

LANGUAGES

English

Bilingual or Proficient (C2)

Hindi

Bilingual or Proficient (C2)

French

Beginner (A1)

real-world units (mm).

- Delivered a robust end-to-end solution for BrakePad analysis in rail component inspection systems.
- Tech Used: Python, OpenCV, CNN (VGG-16), UNet, Image Segmentation, Contour Detection.
- **Achievements**: Won Bronze Medal Award

- **Tire Defect Detection** -
- Led the development of an automated tire defect detection system using Raspberry Pi-based multi-camera setup and machine learning models.
- Designed and implemented image acquisition pipeline including segmentation, perspective transformation, and 360 image stitching.
- Developed ML models for tire defect classification (VGG-16) and object detection (YOLOv8), achieving 99.21% training accuracy and 98.66% validation accuracy.
- Built a frugal lab setup using acrylic boards and configured 16 Raspberry Pi cameras for real-time data capture and streaming.
- Created a local dashboard for defect visualization and integrated cloud-based storage for centralized data access.
- Collaborated with cross-functional teams across Chile and Bangalore for hardware setup, data collection, and system integration.
- Tech Used: Python, OpenCV, TensorFlow, YOLOv8, Raspberry Pi, Arducam, ZMQ, LabelImg, GUI Development.
- **Achievements**: Got Regional Best Project Award in Alstom - Chile(South America Region).

- **Audio Analytics** -
- Developed and deployed a real-time audio analytics model for ALSTOM Metro car environments, enabling classification of operational and ambient sounds using edge AI.
- Integrated the solution with NVIDIA Jetson AGX Xavier for on-device inference, optimized for low-latency performance and robustness in noisy conditions.
- Collaborated on system architecture involving microphone arrays, network switches, and TCMS integration, and designed a local test bench for internal validation and simulation.

December 2020 - September 2021
Research Fellow, ***NGN Lab***, Anna University, Chennai

- Worked in NGN Lab in Anna University, MIT Campus under the supervision of **Dr. R. Gunasekaran**.
- Worked under networking domain in UAV sector working under Gazebo and Robotic Operating System.
- **Aerial Surveying of Drone over Construction Site by Integration of**

Algorithms in Gazebo using ROS and Ardupilot.

- The UAV is simulated and implemented through the integration of, Image Recognition with YOLO and Obstacle Detection and Avoidance with LiDAR, as well as employing YOLO to recognize objects from pre-trained image datasets for effective monitoring.
- Ensured the highest standards of scientific integrity were upheld throughout all stages of the research process.

January 2020 - August 2020
Teaching, ***Self***, Remote, IN

- Successfully made my 30+ students learn all the basics, of C/C++, and they got pumped up after they start solving the online questions.
- Increased student comprehension by implementing diverse teaching methods and strategies.

May 2019 - June 2019
Mentorship, ***Brightnet***, Remote, IN

- I mentored a group of 20+ students of my town, for the domain of Web Design & Development. Under this, I covered the basics of HTML, CSS and JAVASCRIPT.

EXTRA CURRICULAR

- Research Paper Published (http://sersc.org/journals/index.php/IJAST/article/view/11287)
- Member at CSE - Association (CSEA), SRM IST, KTR.
- Member of 'Humanitarian Services', SRM IST, KTR.

INTERESTS

Debugging, Teaching, Reading, Cricket