Sharik Ali Ansari

https://kunwarsharik.github.io/Website/index.html

286/1 Sheikhpuri,
BSM College Road, Roorkee,
Uttarakhand 247667.
+(91) 914 923 0912
kunwar.sharik@gmail.com

Research Areas

Computer Vision, Human-Computer Interaction, Machine Learning, Deep Learning.

Education

B. Tech. in Computer Science and Engineering — College of Engineering Roorkee. Aggregate - 72% (First Division)

12th class from — Army Public School No.2, Roorkee. Aggregate- 85%

10th class from — St. Gabriel's Academy, Roorkee. Aggregate- 80%

Research Advisors

Dr. Ankush Mittal, Ph.D., Director of Raman Classes, Ex Asst. Professor at NUS Singapore.

Dr. Brij Mohan Singh, Ph.D., Director of College of Engineering Roorkee.

Dr. Koteshwar Rao Jerripothula, Ph.D., Nanyang Technological University, Asst. Professor at IIIT-Delhi.

Publications

Eyes-based Features for Detection of Neurological Disorders in Videos. Sharik Ali Ansari, Koteswar Rao Jerripothula, Pragya Nagpal, Ankush Mittal. Multimedia Tools and Applications Journal. MTAP-D-20-00779R1(In third review).

It aims to test the viability of Spatio-temporal eye features for neurological disorder detection. A framework is developed that helps us detect disorders in unconstrained environments, even in low dataset settings. And we were the first ones to automatically detect blepharospasm and cervical dystonia. We also contributed seven datasets. Among them the first public datasets for three disorders.

An Optimal Vision-based Potential Derailment Detection System. Koteswar Rao Jerripothula, Sharik Ali Ansari, Rahul Nijhawan, Ankush Mittal. Multimedia Tools and Applications Journal. MTAP-D-19-03286(In second review).

The aim is to detect Buckling and Hogging in railway tracks. Using exhaustive experimentation, we investigated which pretrained model is the best feature extractor and

which ML algorithm is the best classifier for such work. Using transfer learning and an equation to balance bias and variance, we chose the best combination. We contributed the first public dataset, and we were the first ones to use deep learning for detecting misalignment in railway tracks.

Recent Projects

Preventing Computer Vision Syndrome using Computer Vision: Features like number of blinks, distance of eyes from the screen, iris movement, head angle, posture, brightness of environment, etc. are created using deep learning based facial landmark detection models and various image processing techniques. The final model gives the user recommendations about what is incorrect in his behavior while working with screens. It also tells how the user's eyes can be protected while working long hours on screens/monitors.

Virtual Mouse for smooth Interaction in Augmented Reality environment: The aim is to create a device that can be used as a mouse in VR/AR environment. It uses MPU6050, a 3-axis 6 degree of freedom sensor. Using an HC05 BlueTooth module and a microcontroller, it sends movement information to the VR/AR device. The device fits on a finger tip. The speed of cursor is proportional to the speed of hand. Almost all functions of a mouse are replicated successfully.

Railway Accident Avoidance System- It aims to detect all possible causes of train accidents using a modified transfer learning approach. From trees falling on tracks to landslides, and from flooding of railway tracks to detecting humans and animals on railway tracks, it detects every possible cause of an accident. It also successfully tells about broken and misaligned tracks. The detection is done from 1 mile away so that the train can be stopped and the accidents could be prevented.

Violence Detection In Real-Life situations: It aims to detect violence on the road. Also, it detects, are women involved in the situation. It measures the degree of violence '1' being scuffle and pushing, '2' being some object used to hit, and '3' being blood coming out. The framework uses Deep convolutional neural networks as a backbone along with image processing.

COVID Full Body Intelligent Sanitization System: It Aims to provide full-body sanitization. Two sg90 servos, one each for left and right movement, one mg995 servo for up-down movement, and one 12V 300 rpm dc motor for sanitizer mist generation, are used. All servos are modified for 360-degree rotation. To optimize the throwing of sanitizer mist, an ultrasonic sensor is used, which detects if the mist thrower is in front of the human body or not. If a human is detected in front, it throws the mist.

Patents

Computer Vision Aided House Electricity Management System(implemented ready to submit). As a better approach than using various sensors to detect if a human is present in a room not, we used an IR camera system with raspberry pi. The raspberry pi sends a couple of images per minute to a PC. On the PC, we detect human presence using deep learning. The effective area of devices like AC, heater, fan, etc., is programmed into the PC. If a human is outside the effective area of the device, the raspberry pi turns off the device. The results are amazing, upto 25% of electricity can be saved.

Temperature Controlled Utensils(Ready to submit). The aim is to keep your food and beverages at the temperatures you want. A Microcontroller is used to process temperature data and operate heating and cooling units fitted inside the utensil. For power, depending upon the size of the utensil, 4 to 6 18650 lithium batteries are used.

My Custom Machine Learning Library

Raw codes for traditional Machine learning algorithms, ANN, CNN, RNN, Reinforcement learning algorithms, GANs and RPNN for fast and better research.

Awards

B.Tech. Full 4-year Tuition Fee Waiver Scholarship. Based on National College Entrance Exam JEE-Mains.

Skills

HCI, Computer Vision, IoT, Robotics, Machine Learning, Virtual Reality, Augmented Reality, Parallel Programming, BASIC (Animation, Web Dev, Android Dev).

Tools

Anaconda-python, Google Colab, Dev C++, Wireshark,WEKA, Orange, ArduinoIDE, Raspberry pi, CUDA, OpenCL, OpenCV, Amazon AWS,, Adobe Photoshop, Adobe Illustrator, Blender, HTML/CSS, android studio.

Experience

Internship on topic "Convolutional Neural Networks" at Indraprastha Institute of Information Technology, Delhi (June 01-Aug 15, 2020).

Internship on topic "Testing Viability of ML Ensembles for Epileptical seizure detection" at RWX Technologies. (May 15-July 15, 2018).

Teaching

Mentorship at Raman Classes *(Aug 2019-present)*.

Technical Certifications

Data Science for Engineers, *Indian Institute of Technology Madras (NPTEL).*

Data Mining, *Indian Institute of Technology Kharagpur (NPTEL).*

Cloud Computing, *Indian Institute of Technology Kharagpur (NPTEL).*