International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-13 Issue-2, January 2024

# Computer Vision Integrated Website

**C S S Krishna Kaushik, Prathit Panda, P S S Asrith, M Patrick Rozario, Ayain John**

***Abstract:** Computer vision is an integral part of artificial intelligence that empowers machines to perceive the world similar to human vision. Despite its extensive evolution, widespread awareness of its potential remains limited. The goal of the "Computer Vision Integrated Website" paper is to enhance awareness and exhibit the capabilities of computer vision. By creating an accessible platform featuring various computer vision models, authors aim to captivate audiences and drive growth in the field. The paper seeks to illustrate how computers interpret visual information by integrating user-friendly computer vision models into a website. Through practical demonstrations like emotion detection and pose estimation, authors intend to showcase the potential of computer vision in everyday scenarios. Ultimately, authors strive to narrow the knowledge gap between technical advancements in computer vision and public understanding, fostering curiosity and encouraging broader interest in the technology.*

***Keywords:** Computer vision, Pose Estimation, Emotion Detection.*

## I. INTRODUCTION

The paper which mainly focuses on building a basic model for the sole purpose of user interaction and awareness of computer vision. It has plenty of future prospects as the number of Computer vision applications are always increasing. The first models that has been integrated are the pose estimation and emotion detection models. The website which is the main platform that serves as access to these models was not the easiest part to make as integration of computer vision models requires considerable amount of time and to run them takes even more time than expected. Even though the core priority of the paper was a success, optimization is required for more smooth running.

**Manuscript received on 21 December 2023 | Revised Manuscript received on 31 December 2023 | Manuscript Accepted on 15 January 2024 | Manuscript published on 30 January 2024.**

***Correspondence Author(s)**

**C S S Krishna Kaushik**, Department of Artificial Intelligence and Machine Learning Dayananda Sagar University, Bangalore (Karnataka), India. E-mail: kaushik.cssk@gmail.com

**Prathit Panda**, Department of Artificial Intelligence and Machine Learning Dayananda Sagar University, Bangalore (Karnataka), India. E-mail: prathitpanda2003@gmail.com

**P S S Asrith**, Department of Artificial Intelligence and Machine Learning Dayananda Sagar University, Bangalore (Karnataka), India. E-mail: asrith.pulya@gmail.com

**M Patrick Rozario**, Department of Artificial Intelligence and Machine Learning Dayananda Sagar University, Bangalore (Karnataka), India. E-mail: pat222rick@gmail.com

**Prof. Ayain John*,** Department of Artificial Intelligence and Machine Learning Dayananda Sagar University, Bangalore (Karnataka), India. E-mail: ayainjohn@gmail.com, ORCID ID: 0000-0002-6058-1228



The study by Boris Knyazev, Roman Shvetsov, Natalia Efremova, and Artem Kuharenko [8][12]. exemplifies pose estimation evolution in their paper titled "Leveraging large face recognition data for emotion classification." Their work underscored the fusion of face recognition and audio features, surpassing benchmarks and advocating for the pivotal role of extensive datasets in fortifying accuracy and exploring novel emotion scales. Another significant point emerges from the evaluation of Support Vector Machine (SVM) kernels in emotion recognition, as evidenced by the study conducted by Ibrahim A. Adeyanju, Elijah O. Omidiora, and Omobolaji

F. Oyedokun [10]. Their paper, "Performance Evaluation of Different Support Vector Machine Kernels for Face Emotion Recognition," identified the Quadratic function kernel for superior accuracy, albeit revealing computational time trends that were inconclusive despite the accuracy improvements with larger image feature dimensions.

Facial feature extraction methodologies have played a pivotal role in shaping advancements in emotion recognition [7]. The comprehensive survey by Viha Upadhyay and Prof. Devangi Kotak [7], titled "A Review on Different Facial Feature Extraction Methods for Face Emotions Recognition System," highlighted the efficacy of geometry-based and appearance-based techniques, achieving remarkable accuracy. Conversely, the hybrid approach introduced by Maryam Imani and Gholam Ali Montazer in their paper "GLCM Features and Fuzzy Nearest Neighbor Classifier for Emotion Recognition from Face" surpassed existing models, advocating for the superiority of their combined methodology with an outstandingaverage recognition rate. Parallel explorations ventured into multi-view human pose estimation and activity recognition. Michael

B. Holte, Cuong Tran, Mohan M. Trivedi, and Thomas B. Moeslund highlighted model-based pose estimation techniques and associated challenges in their paper titled "Human Pose Estimation and Activity Recognition from Multi-View Videos." Simultaneously, Guyue Zhang, Jun Liu, Hengduo Li, Yan Qiu Chen, and Larry S. Davis proposed an innovative fusion method for "Joint Human Detection and Head Pose Estimation via Multi-Stream Networks for RGB-D Videos," showcasing state-of-the-art performance through integrated data streams. Advancements in 3D human pose estimation were underscored by Jinbao Wang, Shujie Tan, Xiantong Zhen, Shuo Xu, Feng Zheng, Zhenyu He, and Ling Shao [6][13] in their comprehensive review titled "Deep 3D human pose estimation." Their paper emphasized the significance of deep learning methodologies while acknowledging the challenges in real-world scenarios and multi-person cases.

Collectively, these studies delineate diverse methodologies in emotion recognition from facial cues, emphasizing technological advancements while advocating for robust, scalable, and efficient approaches to fortify accuracy in practical applications.

Though these are very helpful in the future prospects, the paper kickstarts the new concept of integrating multiple computer vision models. The reference can be taken into account for comparing the accuracies to prove how the basic model performs.

## II. LITERATURE SURVEY

Emotion recognition from facial expressions has evolved significantly, shaped by innovative methodologies and comprehensive dataset exploration. The paper by Boris Knyazev, Roman Shvetsov, Natalia Efremova, and Artem Kuharenko [4][11], titled "Leveraging large face recognition data for emotion classification," showcased the fusion of face recognition and audio features, surpassing benchmarks. The study emphasized the crucial role of extensive datasets over intricate methodologies, stressing the need for enhanced data to fortify accuracy and explore novel emotion scales.

Another study, conducted by Ibrahim A. Adeyanju, Elijah O. Omidiora, and Omobolaji F. Oyedokun [6] under the title "Performance Evaluation of Different Support Vector Machine Kernels for Face Emotion Recognition," evaluated SVM kernels, pinpointing the Quadratic function kernel for superior accuracy. However, the study revealed inconclusive trends in computational time despite accuracy improvements with larger image feature dimensions.

Diverse methodologies in facial feature extraction have been pivotal in shaping advancements. Viha Upadhyay and Prof. Devangi Kotak [3] presented "A Review on Different Facial Feature Extraction Methods for Face Emotions Recognition System," extensively surveying geometry-based and appearance- based techniques, achieving an impressive 88.9% accuracy. Conversely, the paper authored by Maryam Imani and Gholam Ali Montazer [5], titled "GLCM Features and Fuzzy Nearest Neighbor Classifier for Emotion Recognition from Face," introduced a hybrid approach surpassing existing models, advocating for the superiority of their combined methodology with an outstanding average recognition rate.

Parallel explorations delved into multi-view human pose estimation and activity recognition. Michael B. Holte, Cuong Tran, Mohan M. Trivedi, and Thomas B. Moeslund [7], in their paper titled "Human Pose Estimation and Activity Recognition from Multi-View Videos: Comparative Explorations of Recent Developments," highlighted model-based pose estimation techniques and multi- level pose estimation challenges. Simultaneously, Guyue Zhang, Jun Liu, Hengduo Li, Yan Qiu Chen, and Larry S. Davis [8], through "Joint Human Detection and Head Pose Estimation via Multi-Stream Networks for RGB-D Videos," proposed an innovative fusion method, demonstrating state-of-the-art performance by integrating appearance, shape, and motion data.

Liangchen Song, Gang Yu, Junsong Yuan and Zicheng Liu [1][9][10] use various deep learning models where they use top down and bottom-up approaches Top-down approaches are the straightforward extension of the single-person pose estimation methods, since the first step is to detect and crop each person out and then apply single-person pose estimation algorithms. Bottom-up approaches predict all the body parts first and then assemble the parts to infer full body poses. Jinbao Wang, Shujie Tan, Xiantong Zhen, Shuo Xu, Feng Zheng, Zhenyu He, and Ling Shao [2] outlined recent advancements in 3D human pose estimation in their paper "Deep 3D human pose estimation: A review," emphasizing the significance of deep learning while acknowledging challenges in real-world scenarios and multi-person cases. Collectively, these studies underscore diverse methodologies in emotion recognition from facial cues, emphasizing technological strides while advocating for robust, scalable, and efficient approaches to fortify accuracy in practical applications.

## III. METHODOLOGY

The steps taken to achieve the core working model were discussed in prior to avoid confusion over Implementing the computer vision layers:

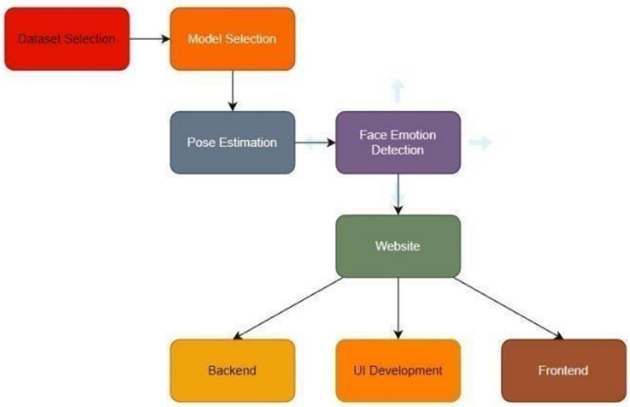


**Fig. 3.1: Methodology Flow**

### A. Model Selection

Pose Estimation and Emotion Detection were the models chosen for this paper. The selection was divided among team members for more efficient time management. Various models, including CNN, MobileNet, YOLOv8, and Media Pipe, were explored. After testing all the models, the CNN model was chosen for emotion detection, and the Media Pipe library was selected for pose estimation, as these models demonstrated the best accuracy and performance for the detections.

### B. Datasets Used

The Face Emotion Recognition Dataset from Kaggle was employed for emotion detection. The dataset comprises images depicting 7 different face expressions or emotions exhibited by various individuals, including anger, contempt, disgust, fear, happiness, sadness, and surprise. Each image in the dataset is labeled with the corresponding face emotion.

Retrieval Number: 100.1/ijitee.B978313020124
DOI: 10.35940/ijitee.B9783.13020124
Journal Website: www.ijitee.org



Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

### C. Pose Estimation

To detect and track the movements of different body parts in images, as well as 2D and 3D motion videos, the pose estimation model enables accurate identification of specific actions, whether the body is in motion or stationery. Understanding the position and spatial orientation of objects and bodies in a given environment, the model proves particularly useful in the fields of robotics and augmented reality.

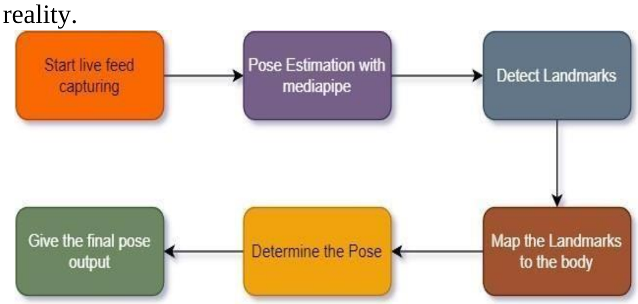


**Fig. 3.2: Pose Estimation Design**

One specific application author has developed is a pose estimation model designed to count repetitions of bicep curls and determine the position of the hand during the curl (either 'up' or 'down'). This model works seamlessly in both video recordings and real-time/live feeds. Utilizing the Media Pipe computer vision model, pre-trained to detect and track body movements, authors are able to achieve precise predictions at a rate of 30frames per second.

The Mediapipe library, created by Google, provides access to various pre-trained machine learning models like object detection and pose estimation. These models can be customized based on developers' needs. The library was utilized to access the pose estimation model, which assigns specific landmark labels to different body parts to estimate body posture. There are a total of 33 landmarks throughout the human body that can be used to individually separate and identify the body parts. The OpenCV library was also employed to access the webcam to record and relay the live feed for real-time pose estimation on a moving body. In contrast to the present model, the approach outlined by involves initially focusing on methods exclusively utilizing 2D multi-viewimage data before delving into comprehensive 3D-based techniques.

### D. Emotion Detection

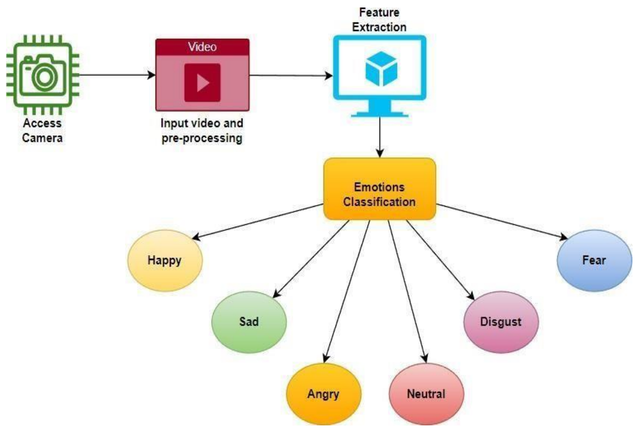


**Fig. 3.3: Face Emotion Detection Design**

The libraries imported for image processing, deep learning, and data visualization include NumPy, Pandas, cv2 (OpenCV), Matplotlib, Seaborn, TensorFlow, Keras, PIL (Python Imaging Library), Zip File, Image Data Generator, Model Checkpoint, Early Stopping, Reduce LR On Plateau, and I Python. display. Data collection involves acquiring diverse image sets, followed by preprocessing, including augmentation and normalizationtechniques using generators. Training the model incorporates optimizing performance and preventing overfitting through strategic callbacks used: Model Checkpoint, Early Stopping, and Reduce LR On Plateau. Evaluation of the model's performance on test data was used to measure its predictive capacity. Moreover, the model demonstrates image prediction capabilities, loading a trained model for emotion prediction from preprocessed images. It also includes live camera feed capture and face detection via OpenCV, presenting real-time image analysis. In their research, [7] utilized the six standard emotion categories—smile, sad, surprise, anger, fear, disgust, and neutral—to classify emotions in the final step of their Facial Emotion Recognition (FER) system whereas this model uses seven classes---happy, sad, angry, neutral, disgust and fear.

### E. Frontend/UI Development

The website was developed using the React.js framework for the frontend, employing HTML, CSS, and JavaScript. For the UI, Bootstrap CSS was utilized for different styled components. The website features a welcome page that redirects to the options page, where users are prompted to choose the computer vision model they want to try. The two options provided are pose estimation and face emotion detection. Dependingon the user's choice, they are redirected to the chosen computer vision model page, where they can try out models that perform real-time detections using the webcam feed.

### F. Backend Implementation

In order to handle user interactions and routing between different pages of the website, authors implemented Python Flask in the backend. The Flask code is responsible for hosting the website backend on a local server, enabling real-time routing.

## IV. ARCHITECTURE

The website implementing live feed analysis with a focus on pose estimation and emotion detection using computer vision models:

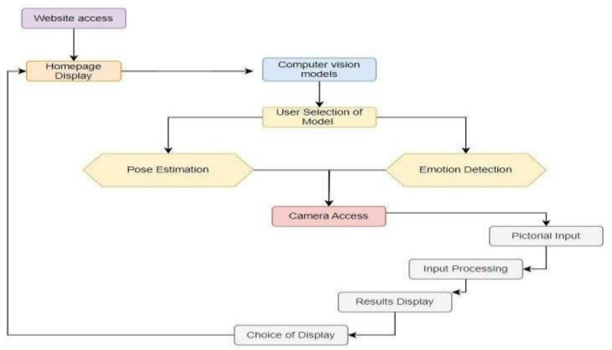


**Fig. 4.1: Architectural Design**

Retrieval Number: 100.1/ijitee.B978313020124
DOI: 10.35940/ijitee.B9783.13020124
Journal Website: www.ijitee.org



Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

### A. Frontend/UI Layer

- Live Camera Feed: Develop a real-time video feed interface using web technologies (HTML5, JavaScript) to capture live video from the user's device camera.
- UI Elements for Results: Create sections or overlays to display the analyzed results such as detectedposes and recognized emotions.

### B. Backend/API Layer

- Web Server and WebSocket Integration: Employ a backend (Flask) using WebSocket communication to handle the continuous live video stream from the frontend to the backend for analysis.
- Real-time Image Processing: Implement real-time image preprocessing on the server, optimizing the live feed frames for pose estimation and emotion detection.
- Pose Estimation Model Integration: Connect the backend with the pose estimation model's API to continuously analyze the live video frames, extracting and annotating human poses in real time.
- Emotion Detection Model Integration: Similarly, interface the backend with the emotion detection model to detect emotions portrayed by individuals within the live video stream.

### C. Pose Estimation Model Layer

Model Server for Pose Estimation: Host the pose estimation model on a dedicated server or cloud platform ensuring high-speed and real-time processing of video frames.

### D. Emotion Detection Model Layer

Model Server for Emotion Detection: Host the emotion detection model on a dedicated server or cloudplatform to swiftly process and recognize emotions from the video frames.

### E. Feedback and Visualization

Real-time Feedback to UI: Send the analyzed results back to the frontend/UI via WebSocket for immediate visualization and user interaction.

### F. Security and Authentication

Secure Data Streaming: Implement security protocols to secure the live video stream between the frontend and backend, ensuring data privacy during transmission.

## V. INTEGRATION

The integration of live feed analysis for pose estimation and emotion detection within a website involved orchestrating a seamless synergy between the frontend and backend layers. Through the frontend/UI, a live camera feed interface is crafted, enabling users to stream video directly from their devices. This continuous video feed is transmitted to the backend via WebSocket communication, where real-time image preprocessing optimizes frames for efficient analysis. Here, specialized computer vision models for pose estimation, such as Open Pose, and emotion detection models, like CNN-based classifiers, are integrated. These models, hosted on dedicated servers or cloud platforms, work harmoniously to extract intricate human poses and discern emotional cues from the live video stream. The backend then promptly relays the analyzed results back to thefrontend, empowering users with immediate insights into detected poses and recognized emotions, thereby providing a fluid and responsive user experience.

## VI. RESULT AND ANALYSIS

### A. Pose Estimation

After selecting the model for the Pose detection, the website asks permission for the camera, once permission is granted then the user can press the start button and make use of the Pose Detection model.

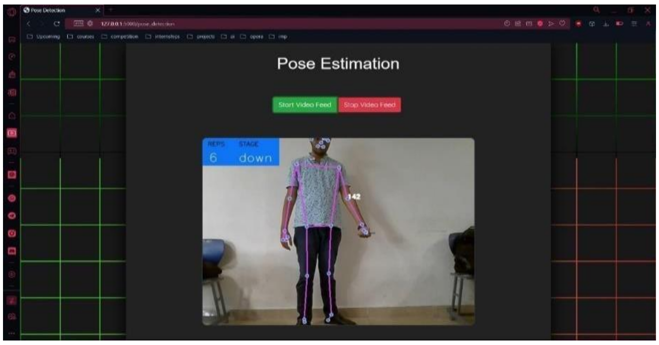


**Fig. 6.1: Successfully Detected Body Pose**

As seen in the above image, the Pose Emotion model detects the person's body landmarks and the reps.

### B. Emotion Detection

The trained model exhibited promising performance in emotion prediction from images. During training, the model achieved a validation accuracy of approximately 80% after 30 epochs, indicating good generalization to unseen data. Evaluation on the test dataset further confirmed the model's effectiveness, yielding a test accuracy of 78%. The precision, recall, and F1-score for each emotion class were computed, showing balanced performance across various emotions. Notably, the model demonstrated robustness in recognizing basic emotions like happiness, sadness, and anger. Moreover, the live camera feed integration successfully captured real-time images, where the model accurately predicted emotions within captured frames. Face detection capabilities using OpenCV further enhanced the model's applicability, enabling identification and prediction of emotions from detected faces. Continuous improvements, such as fine-tuning and expanding the dataset for more nuanced emotions, can enhance the model's accuracy and applicability in diverse scenarios. Overall, the model showcased promising results, offering a solid foundation for emotion prediction in images, particularly in real-time applications and human-computer interaction scenarios. In the study by, the analysis involved evaluating four SVM kernels for classifying seven face emotions, with the Quadratic function kernel demonstrating superior performance in accuracy compared to the other three kernels.

*Retrieval Number: 100.1/ijitee.B978313020124*
*DOI: 10.35940/ijitee.B9783.13020124*
*Journal Website: www.ijitee.org*



*Published By:*
*Blue Eyes Intelligence Engineering*
*and Sciences Publication (BEIESP)*

Additionally, they observed an increase in average accuracy correlating with higher image feature dimensions. However, it's worth noting that the current model being presented generally outperforms many existing approaches in terms of overall performance. The figures showcase the processed datasets.

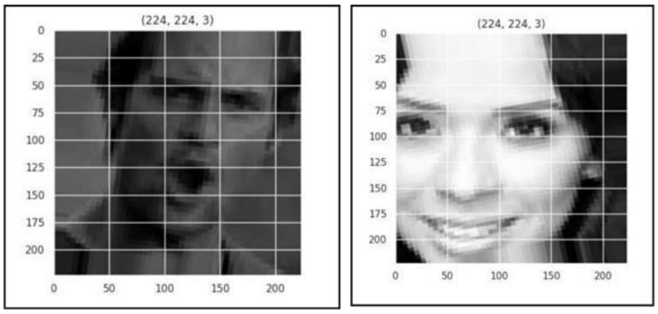


**Fig. 6.2: Dataset Showing the Face Emotions (Surprised and Happy)**

The model was set for thirty epochs and the accuracy score was not the best but the basic emotions were predicted without a problem. Once the user selects the Face Emotion Detection model, then the web page will ask permission for using the camera. The user should grant permission and press the start button for the model to start identifying the Emotions

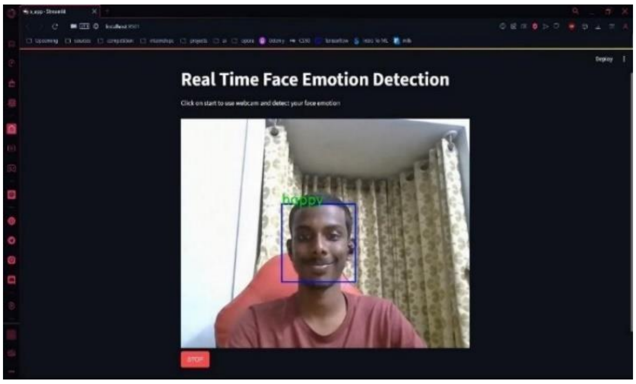


**Fig. 6.3: Showing the Face Emotion**

As seen in the above image, the Face Emotion model detects the person's emotion as happy.

## VII. CONCLUSION AND FUTURE ENHANCEMENT

The paper holds the potential to expand and grow significantly, given the abundance of readily available computer vision models. The goals were achieved by implementing two models, but the paper can be expanded by integrating additional models, exploring new techniques, enhancing APIs, discovering more efficient libraries and datasets, and even switching to a cloud platform like Amazon AWS for faster and more dependable output. Optimizing the API to boost the speed of data processing would ensure that the paper performs optimally, allowing users to receive results in real time. Overall, there are countless opportunities to enhance the paper and make it even more efficient and powerful. By continuing to explore new, innovative approaches and different computer vision models, we can take the paper to a completely new level.

## DECLARATION STATEMENT


| Funding | No, I did not receive. |
|---|---|
| Conflicts of Interest | No conflicts of interest to the best of our knowledge. |
| Ethical Approval and Consent to Participate | No, the article does not require ethical approval and consent to participate with evidence. |
| Availability of Data and Material/ Data Access Statement | Not relevant. |
| Authors Contributions | All authors have equal participation in this article. |


## REFERENCES


1. Liangchen Song, Gang Yu, Junsong Yuan and Zicheng Liu / Human Pose Estimation and Its Application to Action Recognition: A Survey - Journalof Visual Communication and Image Representation - (2021)
2. Jinbao Wang, Shujie Tan, Xiantong Zhen, Shuo Xu, Feng Zheng, Zhenyu He and Ling Shao / Deep 3D human pose estimation: A review - Computer Vision and Image Understanding Volume 210 - September 2021 https://doi.org/10.1016/j.cviu.2021.103225
3. Viha Upadhyay and Prof. Devangi Kotak / A Review on Different Facial Feature Extraction Methods for Face Emotions Recognition System - Pro- ceedings of the Fourth International Conference on Inventive Systems and Control - (ICISC 2020) https://doi.org/10.1109/ICISC47916.2020.9171172
4. Boris Knyazev, Roman Shvetsov, Natalia Efremova and Artem Kuharenko / Leveraging large face recognition data for emotion classification - 13th IEEE International Conference on Automatic Face & Gesture Recognition - [2018]
5. Maryam Imani and Gholam Ali Montazer / GLCM Features and Fuzzy Nearest Neighbor Classifier for Emotion Recognition from Face - 7th In- ternational Conference on Computer and Knowledge Engineering (ICCKE2017) - [October 26-27 2017] https://doi.org/10.1109/ICCKE.2017.8167879
6. Ibrahim A. Adeyanju, Elijah O. Omidiora and Omobolaji F. Oyedokun / Performance Evaluation of Different Support Vector Machine Kernels for Face Emotion Recognition - SAI Intelligent Systems Conference - [2015 November 10-11]
7. Michael B. Holte, Cuong Tran, Mohan M. Trivedi and Thomas B. Moeslund / Human Pose Estimation and Activity Recognition From Multi- View Videos:Comparative Explorations of Recent Developments - IEEE JOURNAL OF SELECTED TOPICS IN SIGNAL PROCESSING, VOL.6, NO. 5, - SEPTEMBER 2012 https://doi.org/10.1109/JSTSP.2012.2196975
8. Guyue Zhang, Jun Liu, Hengduo Li, Yan Qiu Chen and Larry S. Davis / Joint Human Detection and Head Pose Estimation via Multi-Stream Net- works for RGB-D Videos - IEEE Signal Processing Letters
9. Bhushan, Dr. U. (2022). Review of Literature on the Media Uses and Gratifications Derived by Students of Higher Education in India. In Indian Journal of Mass Communication and Journalism (Vol. 2, Issue 1, pp. 1–5). https://doi.org/10.54105/ijmcj.a1020.092122
10. Storozhenko, L., & Petkun, S. (2019). Electronic Communications as an Element of Management. In International Journal of Innovative Technology and Exploring Engineering (Vol. 8, Issue 11, pp. 459–466). https://doi.org/10.35940/ijitee.k1401.0981119
11. Dogra, A., & Dr. Taqdir. (2019). Detecting Intrusion with High Accuracy: using Hybrid K-Multi Layer Perceptron. In International Journal of Recent Technology and Engineering (IJRTE) (Vol. 8, Issue 3, pp. 4994–4999). https://doi.org/10.35940/ijrte.c5645.098319
12. Karanje, P., & Eklarker, Dr. R. (2019). Efficient Multipath Routing to Increase QoS by Link Estimation and Minimum Interference path in MANET'S. In International Journal of Engineering and Advanced Technology (Vol. 9, Issue 2, pp. 4806–4811). https://doi.org/10.35940/ijeat.b2840.129219

13. Proença, M. da C. (2022). On the Need of Quick Monitoring for Wildfire Response from City Halls. In Indian Journal of Image Processing and Recognition (Vol. 2, Issue 3, pp. 1–4). https://doi.org/10.54105/ijipr.c1014.042322

## AUTHORS PROFILE

**Patrick,** currently pursuing a specialized BTech in Artificial Intelligence and Machine Learning, is driven by a profound passion for the convergence of technology and human potential. He finds immense fascination in the eloquence of analogies when articulating intricate technological concepts, alongside nurturing a penchant for creative crafting pursuits. Engaged actively in diverse learning events, he is motivated by the belief that innovation and continuous learning serve as pivotal keys to unlocking technology's vast potential. His journey involves exploring technological frontiers and seeking innovative solutions dedicated to the betterment of society.

**Pulya Satya Sri Rama Asrith,** currently pursuing a Bachelor's degree in Computer Science Engineering with a specialization in Artificial Intelligence and Machine Learning. Throughout my academic journey, I have engaged in numerous projects encompassing a wide array of machine learning algorithms, ranging from Linear Regression and Naïve Bayes to Convolutional Neural Networks. The hands-on experience and research involvement with these algorithms have fueled my enthusiasm for delving deeper into the realm of Computer Vision. Collaborating with my peers, I actively participated in the development of a project titled "Computer Vision Integrated Website." I played a crucial role in implementing a Facial Emotion Recognition model within this project. To ensure optimal functionality, I conducted an extensive comparison of various Computer Vision algorithms, ultimately selecting the one that demonstrated the most promising results for our specific application. This immersive experience has not only enhanced my comprehension of Computer Vision but has also intensified my passion for the field, motivating me to explore and contribute more extensively to this dynamic domain.

**Kaushik,** a dedicated and enthusiastic third-year student pursuing a B.Tech degree in Computer Science Engineering with a specialization in Artificial Intelligence and Machine Learning at Dayananda Sagar University in Bangalore. At the age of 20, I have already immersed myself in the fields of Machine Learning and Full Stack Web Development. As a Machine Learning Engineer and Full Stack Web Developer, I bring a unique blend of theoretical knowledge and practical skills to the table. My academic journey has equipped me with a strong foundation in cutting-edge technologies, enabling me to contribute meaningfully to the intersection of AI and web development. I am passionate about exploring the vast potential of artificial intelligence to solve real-world challenges. My experiences in machine learning projects and web development have honed my problem-solving abilities and fostered a keen interest in creating innovative solutions.

**Prathit Panda,** presently enrolled in the pursuit of a Bachelor's degree in Computer Science Engineering with a focus on Artificial Intelligence and Machine Learning. Throughout my academic journey, I have undertaken several projects involving diverse machine learning algorithms, including Linear Regression, Naïve Bayes, and Convolutional Neural Networks. Motivated by my research and practical experience with these algorithms, I developed a keen interest in specializing further in Computer Vision. In collaboration with my classmates, I actively contributed to the creation of a project titled "Computer Vision Integrated Website." Within this project, I played a pivotal role in implementing a Pose Detection model. To ensure optimal performance, I conducted a thorough comparison of various Computer Vision algorithms and selected the one that yielded the best results for our specific application. This experience has deepened my understanding and passion for the field of Computer Vision, driving my desire to explore and contribute further to this exciting domain.

**Prof. Ayain John** is currently working as an Assistant Professor in the Department of Computer Science & Engineering (AIML) at DSU. Prior to this, she served as an Assistant Professor in the Department of Information Science and Engineering at AMC Engineering College. She completed her undergraduate and postgraduate studies at Anna University Chennai. Ayain is a dedicated and passionate professional with one year of extensive experience in Quality Analysis, Quality Engineering, and 16 years of experience in academia. She has presented and published several papers on Machine Learning and Deep Learning in peer-reviewed journals and conferences. Ayain received the Selfless Service Award in 2023, the Teaching Excellence Award in 2019, and the Best Teacher Award in 2006. She is currently pursuing research on Cognitive Machine Learning at Amrita University, with a focus on machine learning, deep learning, and computer vision.