Leveraging AI for automated handling Grievance handling in railways

Introduction:

Going through the current Rail Madad platform a person facing grievance has to go through a lengthy form to be filled up, even after filling up the form the situation is not being identified yet resolved in the current manual system.

HOW CAN WE IMPROVE THIS??. The platform could benefit from an AI driven solution that automates the identification of the problem through video, image, audio and description.

Key goals of a project include streamlining Grievance redressal and improving the efficiency in responding to incidents on trains.

Related Works :

Recent advancements in AI and ML have found extensive applications in automating processes and enhancing operational efficiency. In Indian railways AI driven system for Grievance management are emerging previously just focusing in automated chat bot systems for resolving complaints such as the work of "MISHRA". However, the specific applications of AI for identifying railway personal responsible for addressing grievances remains underexplored current systems either only focus on automating complaint registration process or analysing the nature of grievance, but none are able to do the real time personnel identification.

This where our project stands out by combing image classification with automated personnel identification thus alerting the system. Through this project we wish to improve response time and overall efficiency in grievance resolution within Indian railway.

Methodology:

1) **Data Preprocessing :** As it is known the system started with collecting all the required images for various situations that we had identified from sources like Rail Mittra and times of India. Further these images will be processed as in to meet the requirements for training our CNN model like resizing , standard input value and normalising the pixel values.

2) **Model Deployment :** Through the TensorFlow and Kera's we designed a CNN model to classify the images into the predefined categories. The model was trained to be able to classify them based on the visual input given to it. The model was validated based on test data. This model was saved and later loaded to classify images in real time.

3) **Flask Based Back End:** Python was used for the further logics required to take the actions once the situation was identified and then through Flask module the uploaded images were passed to the trained CNN model for classification, identifying the type of grievance

4) **Personnel Identification :** We used a simulation based PNR data that was linked to certain TTs, CRPFs and Route In-charges. Thus the backend logic would identify the required personnel for the situation based on the PNR number input and the classification of the image.

5) **Frontend User Interface :** A web based frontend was designed using HTML and CSS allowing the user to submit a grievance details. The system would then display that the relevant personnel were informed depending on the classification alongside their IDs.

6) **Flask Messaging and Notification :** the system used flash messaging in flask to inform users about the successful identification of the responsible personnel.

Challenges Faced:

a) One of the major challenges that we faced was the collection of data since there are very less images available on the internet regarding issues related to the train thus web scrapping took up a lot of time. Processing and refining this data further were also one of the major challenges that we did face.

b) Another major issue with working on such models is the False positives or simply put misclassification of the image by the model thus affecting the overall accuracy for it.

c) One small yet significant issue was related to the TensorFlow library since it does not have the support for the latest python version we had to work a new python environment with an older version of python.

Conclusion:

Overall, we came to a particular point where we could find the best way to automate the grievance reporting process and assign the particular personnel for the situation accordingly. Keping users need and satisfaction in mind we are doing it in the simplest way possible to not consume high data for loading the interface and provide an easy and seamless way to register the grievance report.

While building the AI Automated system the main issue we faced was collecting of the dataset, even after surfing through the internet we could only find a few hundreds of images which is not sufficient for the accuracy of the AI model. To tackle this issue we used data augmentation methods to overcome this in the prototype.

We went through the current Rail Madad website and noted down the problems that, we came up with a way to troubleshoot the problem with AI – Driven solution.