

Project Proposal: Facial Emotion Recognition Using PySpark

Abdullah, *22L-7764*, Tahmooras Khan, *22L-7484*

BSDS-4C

FAST-Lahore

## **Introduction**

In the rapidly evolving field of technology, the integration of artificial intelligence (AI) and machine learning (ML) has revolutionized various sectors, including healthcare, entertainment, and security. One such application that has gained significant attention is Facial Emotion Recognition (FER). This project aims to develop a system capable of recognizing human emotions through facial express

## **Background**

Facial emotion recognition is a subfield of computer vision that focuses on identifying human emotions based on facial expressions. It has wide-ranging applications, from enhancing user experience in interactive systems to aiding in psychological research and healthcare. Traditional methods of FER often rely on deep learning models trained on large datasets, which can be computationally expensive

## **Objectives**

- To design and implement a facial emotion recognition system using PySpark and big data analytics.
- To train the model on a large dataset of facial images annotated with corresponding emotions.
- To evaluate the performance of the model in terms of accuracy, precision, recall, and F1 score.
- To explore the potential of integrating the developed system into real-world applications, such as interactive gaming, mental health monitoring, and security surveillance.

## **Methodology**

# Facial Emotion Recognition

## Data Collection and Preprocessing

The project will commence with the collection of a large dataset comprising facial images labeled with different emotions. The dataset will be preprocessed to ensure uniformity in image quality and size. This step is crucial for training a robust ML model.

## Model Development

Using PySpark, the project will develop a scalable and efficient ML pipeline. The pipeline will include feature extraction from the facial images, followed by the training of a deep learning model. PySpark's distributed computing capabilities will enable the processing of large datasets efficiently, facilitating the training of the model without compromising on performance.

## Evaluation

The performance of the model will be evaluated using standard metrics such as accuracy, precision, recall, and F1 score. Additionally, the model's ability to generalize across different datasets will be assessed to ensure its applicability in real-world scenarios.

## Expected Outcomes

Upon successful completion of the project, the expected outcomes include:

- A scalable and efficient facial emotion recognition system capable of processing large datasets.
- A model with high accuracy in recognizing human emotions based on facial expressions.
- Insights into the potential applications of FER in various domains, including healthcare, entertainment, and security.

## Conclusion

## Facial Emotion Recognition

This project represents a significant step forward in leveraging big data analytics and PySpark for developing advanced AI applications. By focusing on facial emotion recognition, we aim to contribute to the growing field of computer vision and its practical applications. We look forward to the opportunity to present our findings and discuss the potential impact of our work on the broader technological landscape.

## Facial Emotion Recognition

### References

[PySpark Documentation](#)

[Big Data Analytics: Concepts, Techniques, and Applications](#)

[Facial Emotion Recognition: A Survey](#)