

# **Configuration Manual**

MSc Research Project MSCAI1

Caner OZHAN Student ID: x23199253

School of Computing National College of Ireland

Supervisor: Devanshu Anand

### National College of Ireland

#### **MSc Project Submission Sheet**

National College of

Ireland

Year: 2024

School of Computing

Student Caner OZHAN Name:

**Student ID:** x23199253

Programme: MSCAI1

Module: Practicum

Supervisor: Devanshu Anand

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Project	Emotion Recognition with Deep Learning-Based Facial
Title:	Expressions: Comparative Analysis of Algorithms

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I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

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Signature: Caner OZHAN

**Date:** 15/11/2024

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## **Configuration Manual**

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# **Facial Expression Recognition Project**

This project is a machine learning pipeline for Facial Expression Recognition (FER), including various model training scripts and pre-trained models. The application was developed in Python 3.12.4 on macOS (MacBook Pro M1, 16GB).

### **Project Structure**

- data\_process.ipynb: Preprocesses data for model training.
- cnn\_training.ipynb: Convolutional Neural Network (CNN) training script.
- knn\_training.ipynb: K-Nearest Neighbors (KNN) training script.
- logistic\_regression\_training.ipynb: Logistic Regression training script.
- randomforest\_training.ipynb: Random Forest training script.
- svm\_training.ipynb: Support Vector Machine (SVM) training script.

### Installation

- 1. Opened the zip file and extracted its contents.
- 2. cd Facial-Expression-Recognition
- 3. Create and activate a virtual environment (recommended): python3 -m venv .venv
- 4. source .venv/bin/activate
- 5. Install the required packages: pip install -r requirements.txt

### Usage

- **Run Data Processing Script**: Start by running the data\_process.ipynb notebook to preprocess the datasets. This step is essential before training any models.
- **Train Models**: After data preprocessing, use any of the model training notebooks to train specific models. Available options include:
  - 1. cnn\_training.ipynb
  - 2. knn\_training.ipynb

- 3. logistic\_regression\_training.ipynb
- 4. randomforest\_training.ipynb
- 5. svm\_training.ipynb

### Notes

- Ensure fer2013.tar.gz is unzipped and data\_process.ipynb is completed before training.
- Ensure data\_process.ipynb is completed before training.
- This project was developed on an M1 MacBook Pro, Python 3.12.4. Compatibility may vary on different systems.