1. Comprehensive Exploration of FER using CML and TL Models

* ***IMP*** – SVMs aren’t considered Deep Learning Techniques so be wary of implementing them, they are just machine learning techniques.
* **SVM**, CNNs, Res-Net, EfficientNet & MobileNet
* MUG Facial Dataset (anger, disgust, fear, happiness, neutral, sadness, and surprise)
* Model accuracy evaluated using precision, recall, accuracy, and F1 score.
* Face Detection done using **Haar Cascade** -> Face region converted to grayscale.
* Facial landmarks identified using **dlib library’s shape predictor**, a regression tree-based ensemble learning tool -> landmarks undergo a normalization process, involving scaling and translation to align them in a standard coordinate frame -> normalized landmarks are then flattened into a one-dimensional array.
* Emotion labels are numerical encoded.

2. Comprehensive Review and Analysis on FER: Performance Insights into Deep and Traditional Learning with Current Updates and Challenges

* Mentions Machine Learning, Deep Learning & Hybrid Techniques
* MobileNetV2 – (speed and accuracy)
* A-MobileNet
* InceptionV3, VGG19, ResnET-50, **DenseNet-161**
* KDEF, SFEW, RAF-DB, FERPlus, CK+, JAFFE, and FER2013 facial expression datasets
* Propose improvements for the VGG16 network.
* accuracy, precision, recall, and F1-score

3. ResEmoteNet

Paper outlines how the model works and so on

CHATGPT LINK: <https://chatgpt.com/share/67b9aa98-0360-8004-b16e-12a7cd3d539e>

<https://github.com/av-savchenko/face-emotion-recognition?tab=readme-ov-file>

<https://github.com/tomas-gajarsky/facetorch>

<https://github.com/ArnabKumarRoy02/ResEmoteNet/tree/main?tab=readme-ov-file#checkpoints>

4. Generalizable Facial Expression Recognition

* Code - <https://github.com/zyh-uaiaaaa/Generalizable-FER>
* The paper aims to allow models to be trained on a singular dataset but generalise to a greater degree on unseen data (Tackles the problem of generalisability)
* The paper aims to improve the generalisation ability of Facial Expression Recognition (FER) models when faced with unseen test samples that have domain gaps from the training set. It addresses the limitation of existing FER methods that rely on labelled or unlabelled target samples for fine-tuning, which is often infeasible in real-world scenarios. The goal is to develop a FER model that can effectively recognise expressions using only a single training dataset without prior knowledge of the target domain distribution.
* The paper proposes a method that combines a sigmoid mask and a channel-separation module to enhance the accuracy of emotion recognition models. It utilises a learning rate scheduler (ExponentialLR) and demonstrates the effectiveness of different backbones, particularly ResNet-18, to improve performance. The method emphasises the integration of various components to achieve superior results across multiple FER datasets.
* This paper tackles the classification of 7-main emotions
* Datasets mentioned: RAF-DB, AffectNet
* This method might be tested by having the base FER models, first you get their metrics on various datasets without any training and then you integrate this method and see if they generalise better on the un-seen data and if they still perform well on the trained dataset
* Important parts highlighted in .pdf file

5. Enhancing Zero-Shot Facial Expression Recognition by LLM Knowledge Transfer

* FaRL model similar to CLIP but focuses on face-image-text pairs

6. FER using Landmark coordinate features

* Doesn’t have code but seems easy enough to implement
* Uses 3D representations of the 2d faces with python library to extract features and derive emotion mapping. Doesn’t seem to be reliant on facial dataset thus could be quite good to generalise.

Lack of emtion datasets since they only seem to have 7 emotions is there a way to deal with this?