EMOJIFY: Create Your Own Emoji with Deep Learning

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Abstract*—In this paper, we use the FER2013 dataset to feed a convolutional neural network (CNN) architecture that can differentiate emotion from pictures. The CNN model is built using Kera's layers, and the facial expressions are classified using a deep learning model. After that, the emotion will be assigned to an emoji or an avatar. We put our models to the test by creating a real-time vision machine that employs our proposed CNN architecture to do face recognition, emotion classification, and emoji mapping all in one combined phase. In this review paper, we give a complete study of the current body of work on emoji, looking at how they've evolved, how they're used differently, what purposes they have, and what research has been done on them.

Keywords*—Convolution Neural Network (CNN), face detection, emotion classification, emoji mapping, CNN architecture.

I. INTRODUCTION

Emoji are becoming increasingly widely employed in network communication. The ways in which they are used are diversifying as well. They are tightly linked to marketing, legislation, health care, edibles, and a variety of other fields. Emoticons have become a necessary component of modern digital communication.

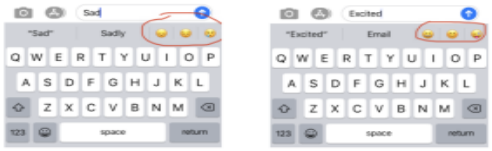

Fig 1: Examples of emoji prediction in android keyboards.

Emoji prediction is a fun variant of sentiment analysis. The goal of this project is to build a deep learning model that can categorise face emotions from photographs. The labelled emotion can then be mapped to an emoji or an avatar. A depressed individual, for example, may send a sad face emoji so that others could understand his or her situation.

II. LITERATURE SURVEY

A literature review contains all investigations on a particular topic that have been undertaken by various researchers. We began our work by carefully studying the project and research papers in order to expand our knowledge on the subject. After much thought about the main ideas, pros and cons of our project, and the possibility of successful completion of the project, we began our work by carefully studying the project and research papers in order to expand our knowledge on the subject. Our basic ideas and projects are similar.

III. PROPOSED SYSTEM

3.1 Details of Hardware & Software:

●Hardware Requirements: Laptop (64-bit) architecture, 4-8 GB RAM), Camera(8 MP)

● Software Requirements:

Operating System: Windows 10
Framework and tools: Opencv, Tensorflow
Language: Python
Technology used: Image pre-processing, TensorFlow, Keras, OpenCv, Deep Learning.

3.2 Steps for Proposed System:

In preparation for educational data, we'll capture video via webcam with a python script that includes OpenCV and Imutils, as well as apply the HAAR cascade classifier and construct an image dataset by capturing the frames of a specific emotion as a face expression. Another option is to get images from Kaggle that have previously been used to characterize an emotion dataset, such as the FER2013 dataset.

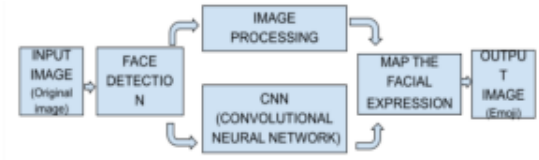

Fig 2: Block Diagram

A. Input the dataset

Images from the FER 2013 dataset that were used to classify emotions are shown below. These images are divided into categories based on the emotion expressed in the facial expressions: happiness, neutral, sadness, anger, surprise, disgust, fear.

B. Data pre-processing and applying augmentation Strategies.

Image data augmentation is used to increase the size of the training dataset in order to improve the model's performance and generalization capacity. The Image Data Generator python module is used to rescale images from [0,255] to [0,1].

The following are some of the advantages:

● All photos are created the same way - some have a large pixel range, while others have a small pixel range. The high range picture tends to cause more loss, whilst the low range image causes less loss. However, the aggregate of the two will contribute to the back propagation update.

● Using a typical learning rate, we can directly reference the learning rate from another's work if both works execute the scaling preprocessing over the same data set of images. Otherwise, a higher pixel range image will result in more loss and will require a lower learning rate.

C. Neural Network architecture.

The next stage is to create a convolutional neural network after preprocessing the data. The input layers, hidden layers, and output layers make up the convolution layer. We add convolutional layers with filters depending on the design of the neural network.

D. Accuracy and loss.

On training data, we achieved a precision of 77 percent with a loss of 0.36, while on validation data, we achieved a precision of 62 percent with a loss of 0.36.

IV. CONCLUSIONS

Emojis are symbols used to represent nonverbal cues. With advancements in computer vision and deep learning, it's now possible to detect human emotions in images. We were able to classify human face expressions in order to filter out and map relevant emojis in this research.

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REFERENCES

[1]. Shreyasee Das and others, Emojis: The Language of the future?ISSN Research India Publication(2017)

[2]. Ankur Ankit, Dhananjay Narayan & Others,Transformation of Facial Expression into corresponding Emoticons, Blue Eyes Intelligence Engineering Sciences Publication(2019).

[3]. S. Chairunnisa and B.A.S. Analysis of Emoji and Emoticon Usage in Interpersonal Communication of Blackberry Messenger and WhatsApp Application User International Journal of Social Science and Management(2017)

[4]. Linda K. Kaye How emotional are Emoji?: Exploring the effect of emotional valence on the processing of Emoji by ELSEVIER(2021)

[5]. Mohd Zuwiri bin Mat Saad and others Analysis of The Use of Interpersonal Communication Emoji on Whatsapp Use Among Students Published by Atlantis Press (2018)

[6]. Qiyu Bai and others A Systematic Review of Emoji: Current Research and Future Perspectives Published byFront Psychol(2019)

[7]. Julia Sick and others The Meaning of Emoji to Describe Food Experiences in Pre-Adolescents Licensee by MDPI(2020)

[8]. Elsi Kaiser & Patrick G. GroszAnaphoricity in Emoji: An experimental investigation of face and non-face Emoji by the LSA (2021)

[9]. Hannah Miller, Jacob Thebault-Spieker, Shuo Chang, Isaac Johnson, Loren Terveen, and Brent Hecht. 2016. "blissfully happy" or "ready to fight": Varying interpretations of emoji. In Proc. ICWSM 2016. AAAI press, 259–26

[10]. Petra Kralj Novak, Jasmina Smailovi´c, Borut Sluban,and Igor Mozeti˘c. 2015. Sentiment of Emojis. PLOSONE 10, 12 (12 2015), 1–22.

[11]. Garreth W. Tigwell and David R. Flatla. 2016. Oh That's What You Meant!: Reducing Emoji Misunder-standing. In Proc. MobileHCI 16. ACM, New York, NY, USA, 859–866.

[12]. Channary Tauch and Eiman Kanjo. 2016. The Role Of Emojis in Mobile Phone Notifications. In Proceed-ings of the 2016 ACM International Joint Conferenceon Pervasive and Ubiquitous Computing: Adjunct (Ubi-Comp'16).ACM, New York, NY, USA, 1560–1565.

[13]. Jackson Feijó Filho, Thiago Valle, and Wilson Prata. 2014. Non-verbal Communications in Mobile Text Chat: Emotion-enhanced Mobile Chat. In Proc.MobileHCI '14. ACM, New York, NY, USA, 443–446.

[14]. B. Anand, B. B. Navathe, S. Velusamy, H. Kannan, A. Sharma, and V. Gopalakrishnan. 2012. Beyond touch: Natural interactions using facial expressions. In proc. CCNC ' 12. 255–259.

[15]. M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.