OFFICIAL ABSTRACT and CERTIFICATION

Using Artificial Intelligence to Deterine Facial Emotions

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This year I wished to do something that involved artificial intelligence because I want to learn how it works and know how to use it in the future. The idea of an AI that can recognize facial emotions could be helpful to people with autism or in virtual assistants like Siri. The first step in this project is to find images for the AI model to learn from. I found the FDEF Stimulus Database and used these pictures to train the model. The database contained around 5,000 pictures for the model to look at. From there these pictures must be separated into two categories, a train folder with roughly 80% of the images and a test folder with the rest. The reason for this is because the model first looks at the train images and then when the model has finished training it uses the test folder to make final adjustments. The script to create the AI can be found in the report. I came up with this script by making adjustments to an image recognition script. The results proved that the project was not successful. The model was very effective at recognizing images it had trained on however on images it had never seen before it failed, often guessing the wrong emotion. The model suffered from overfitting. Instead of making generalizations from the data it started to memorize the data. This can be changed in the future by having a lower learning rate.

Category

Pick one only — mark an "X" in box at right

Animal Sciences

Behavioral & Social Sciences

Biochemistry

Biomedical & Health Sciences

Biomedical Engineering

Cellular & Molecular Biology

Chemistry

Computational Biology & Bioinformatics

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Energy: Sustainable Materials and Design

Engineering Mechanics

Environmental Engineering

Materials Science

Mathematics

Microbiology

Physics & Astronomy

Plant Sciences

Robotics & Intelligent Machines ■

Systems Software

Translational Medical Sciences

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply):

   ☐ human participants   ☐ potentially hazardous biological agents

   ☐ vertebrate animals   ☐ microorganisms   ☐ rDNA   ☐ tissue

2. I/we worked or used equipment in a regulated research institution ☐ Yes ■ No or industrial setting:

3. This project is a continuation of previous research.   ☐ Yes ■ No

4. My display board includes non-published photographs/visual ☐ Yes ■ No depictions of humans (other than myself):

5. This abstract describes only procedures performed by me/us, ■ Yes ☐ No reflects my/our own independent research, and represents one year's work only

6. I/we hereby certify that the abstract and responses to the ■ Yes ☐ No above statements are correct and properly reflect my/our own work.

This stamp or embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Scientific Review Committee.