

# **Emotion Classification of Learners Using E-Learning Platform based on Facial Expressions**

تصنيف المشاعر للمتعلمين باستخدام منصة التعلم الإلكتروني القائمة على تعبيرات الوجه

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## **Abstract**

Our study focused on this aspect of research that can be developed by classifying these emotions more accurately, at a lower cost, and without problems in terms of privacy, by training an artificial neural network, and using machine learning and deep learning techniques to reach high accuracy in classifying the emotions that they experience. It is used by students during electronic lessons through our reliance on virtual facial expressions on the grounds that they result from the reflection of the internal emotions of humans. Where we applied the use of cameras installed on students' computers to collect and classify images without the need for sensors that may be inflexible in use, as the importance of recognizing students' feelings during the electronic lecture is followed up in particular to support the communication process between students and teachers, as the aim of developing this aspect is controlling the quality of education by improving the methods of delivering electronic lectures and transforming negative emotions into positive ones by alerting the teacher during the lesson about the emotions experienced by students. Three Convolutional Neural Networks (Standard Convolutional Neural Networks, GoogleNet Convolutional Neural Networks, and SqueezeNet Convolutional Neural Networks) were trained using two datasets (CK +, JAFFE). This is to classify the data using (vector support machine and fine-tuning). Then test were conducted on them and compared in terms of accuracy in classification and discrimination of human feelings experienced by the student during the electronic lecture. The results of the tests showed the structures of the previously trained convolutional neural networks that they are superior to the structure of the convolutional neural network built in a standard, and the reason is that the modifications that were made to the special classification layers with pre-trained convolutional neural networks, the accuracy improved from 66.67% to 95% in the classification process.