

Employee Stress Identification in the IT Industry Using Deep Learning Models

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Abstract:

Stress is uncertain, physiological, and psychological constituents that impact human attainment and decrease an individual's lifespan. Accurate detection of stress through facial expressions is unavoidable, otherwise, it leads to severe health problems including cardiovascular problems, shortening immune system, and premature mortality. Stress detection was implemented using facial expressions through image processing, data augmentation, and deep-learning classification techniques. In this research, a Real-world Affective Database (RAF-DB) is an image dataset from Kaggle that was utilized. Three deep learning models: Convolutional Neural Network, Densenet, and a combination of Efficient Net and Squeeze-and-Excitation were used for transfer learning from the pre-trained initial weights and were trained and tested for classifying facial emotions. The accuracy, precision, recall, f1-score, and support for best-performing models. Convolutional Neural Networks in the detection of stress outperformed apart from the other deep learning models; the accuracy for CNN was 85.43%. This paper also used visualizations to analyze and understand the image data, resulting in improved accuracy.

Keywords:

Convolutional Neural Network, Data Visualizations, Deep Learning, Efficient Net, Squeeze and Excitation.