Artificial Intelligence - Driven Mental Health Checkup Mobile App using Deep Learning Techniques for Inclusive Healthcare

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Abstract

Over 970 million people around the world struggle with some mental illness. 14.3% of deaths worldwide, or approximately 8 million deaths each year, are attributable to mental disorders that affect people of all ages and cultures. The absence of the required number of specialists in the mental health field has been posing a serious challenge. This problem can be solved using advanced technology. Therefore, an intelligent mental health checkup application is proposed using deep learning techniques to eliminate irregular psychological illnesses and expand access to psychological well-being services. An Artificial Intelligence (AI) enabled mobile application called AI-MHCheck was developed to address the challenges in mental health services. The application offers a user-friendly platform for self-assessment and potential early detection of mental health concerns. Predictive modeling was employed to extract meaningful patterns from users' input from each survey question. Convolution Neural Network (CNN) and Long Short-Term Memory (LSTM) were used for model building. The performance results show that CNN is the golden model with 83.61% accuracy, 0.3849 loss, 0.7780 precision, 0.9515 recall, 0.3449 RMSE, 0.1189 MSE, and 0.2312 MAE. The AI-MHCheck app can be used to reduce mental disorders for inclusive healthcare. Further studies can apply hyperparameter optimization for model fine-tuning.

Keywords

Artificial Intelligence, Deep learning, Depression, Healthcare, Health checkup, Mental health, Mobile application.