

Automated Mental Disorders Prediction from Textual/Audio Data: A BiLSTM and 2D CNN Approach

Premathilaka, K. K. R. R.^{1,*}, Soyza, E. P. N.¹, Dissanayaka, H. M. M. K.¹, Padmasiri K.M.P.U.¹

¹*Department of Information and Communication Technology,
Faculty of Technology, Rajarata University of Sri Lanka.*

**rukshika10@gmail.com*

Social and economic inequality in today's world adds to the widespread problem of mental health conditions that impact many people. Although clinical interviews are a widely recognized diagnostic procedure, there are questions about its accuracy and efficiency. Social stigma frequently discourages people from getting the right care, which can have fatal results like suicide. To solve these issues, we suggest an automated technique for diagnosing psychological disorders. Our research prioritizes the detection of depression and suicidality and using automated prediction to intervene before serious problems occur. We use an embedded layer Bidirectional Long Short-Term Memory (BiLSTM) model to extract statement labels from textual input. Furthermore, severity scores are extracted from audio data using a Two-Dimensional Convolutional Neural Network (2D-CNN) model. Our models are trained and validated using the Suicide and Depression Detection (DAIC-WOZ) dataset and the Suicide and Depression Detection dataset from Kaggle. The finalized methodology yielded the best classification accuracy, with a range of 90% to 99%. Our study has practical consequences for mental health treatment that go beyond scholarly discourse. Our automated technique can potentially save lives and reduce the workload of mental health practitioners by facilitating early detection and intervention. Through our emphasis on early intervention and prevention techniques, we raise awareness of the significance of diagnosing suicidality and depression. The uniqueness of our approach is in its capacity to transform the provision of mental healthcare and lessen the detrimental consequences that social and economic disparities have on psychological health.

Keywords: *Automated mental disorders prediction; Two-dimensional convolutional neural network; Machine learning; Suicide and depression*