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पेटेंट कार्यालय का एक प्रकाशन
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(54) Title of the invention : PREDICTING SUICIDE ATTEMPTS IN ADOLESCENCE OR YOUNG ADULTHOOD: AN EARLY LIFE FACTORS ASSESSMENT USING TRIBRANCH CNN

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(57) Abstract :

The present invention relates to the development of a new Convolutional Neural Network (CNN), named TriBranch CNN, to evaluate various complexities of early-life factors-influences, including family environment, socio-economic factors, trauma exposure, and neurodevelopment. The proposed model consists of three branches to model temporal information using one-dimensional convolution layers, spatial information using two-dimensional convolution layers to process images of biomarkers, and finally relational learning for factors including social determinants. The model is trained on data collected from 5,000 individuals aged between 12 and 25 years who were monitored over a period of 10 years. The model is able to deliver 92% accuracy and 88% sensitivity in predicting suicidal attempts in two years with an Area Under ROC Curve (AUROC) of 0.95, which is 15-20% better than conventional ML models. The feature importance plot emphasizes childhood adversity as the most significant predictor. The model promises to be useful in early interventions with accurate prediction of suicidal attempts through targeted interventions. FIG.1

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