

Prediction of Relapse in Adolescent Depression using Fusion of Video and Speech Data

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A Introduction

- Depression is a leading cause of disability in adolescents aged 15-24 (11% of Canadian youth have been depressed in their lifetime)¹
- 40% of adolescents with depression experience relapse before adulthood²
- Depression remains undetected and untreated in most adolescents

Objective:

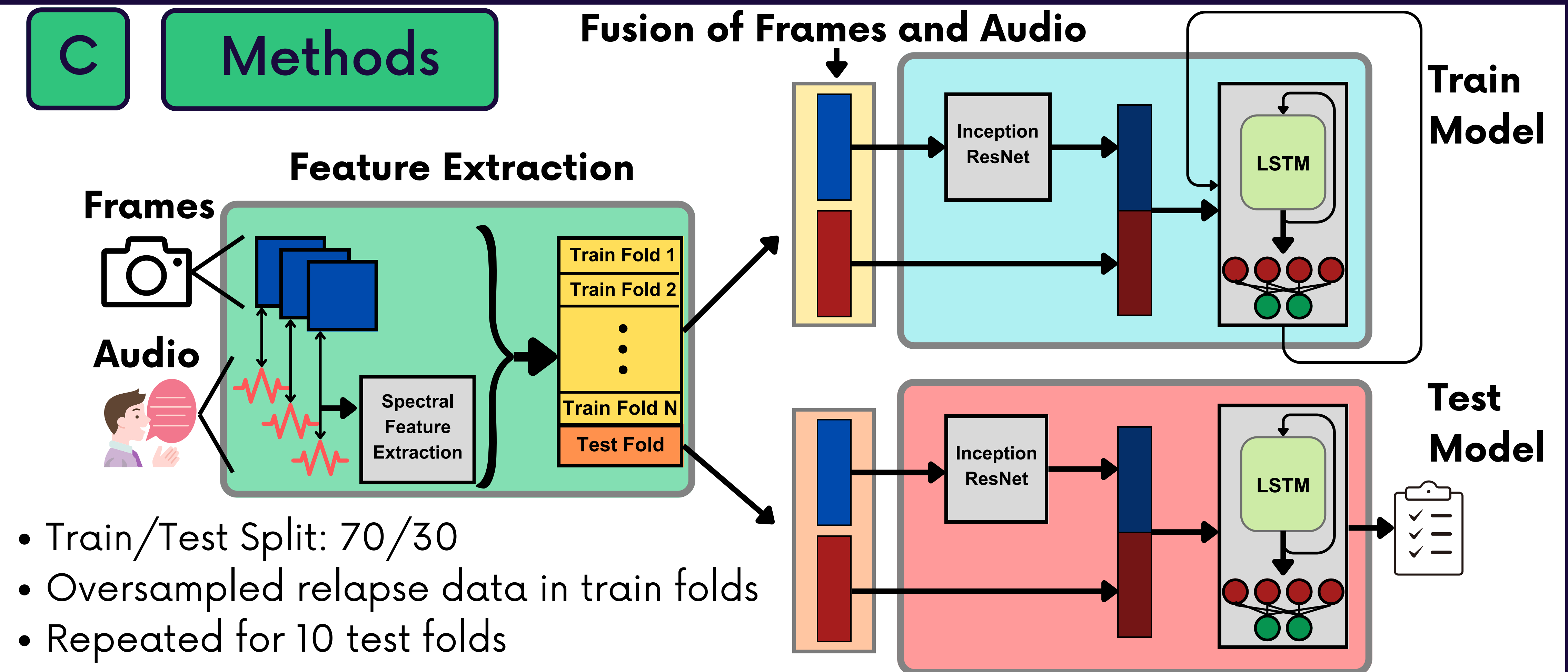
Use digital phenotypes (video and speech) to predict relapse events in adolescents diagnosed with Major Depressive Disorder.

B Datasets

- Depression Early Warning (DEW) is a longitudinal study conducted at CAMH aiming to investigate the use of digital tools for the prediction of depression relapse in adolescents
- Study participants include 52 adolescents aged 12-22 diagnosed with Major Depressive Disorder

Modality	Frequency	Method
80 mental health surveys	Follow-up visits (every 2-4 months)	Online interviews
80 video clips (each 2-10 minutes)	Follow-up visits (every 2-4 months)	Online interviews

C Methods



D Results

Test Fold	MAE	Accuracy
1	0.077	0.92
2	0.28	0.72
3	0.21	0.79
4	0.23	0.77
5	0.12	0.88
6	0.26	0.74
7	0.17	0.83
8	0.23	0.77
9	0.17	0.83
10	0.27	0.73
Average	0.21	0.80

E Discussion

- Predicting relapse of depression from audiovisual features encounters various challenges such as the difficulty in creating a universally applicable depression prediction model due to subjective labels and the heterogeneous nature of the condition
- Future directions include prioritizing gender and context-aware models, leveraging longitudinal data for tracking changes, and integrating wearable technologies for a more comprehensive understanding of the trajectories of depression prediction

[1] Depression and suicidal ideation among Canadians aged 15 to 24, <https://www150.statcan.gc.ca/n1/pub/82-003-x/2017001/article/14697-eng.htm>
[2] Korczak DJ, Westwell-Roper C, Sassi R. Diagnosis and management of depression in adolescents. CMAJ. 2023 May 29;195(21):E739-E746. doi: 10.1503/cmaj.220966.