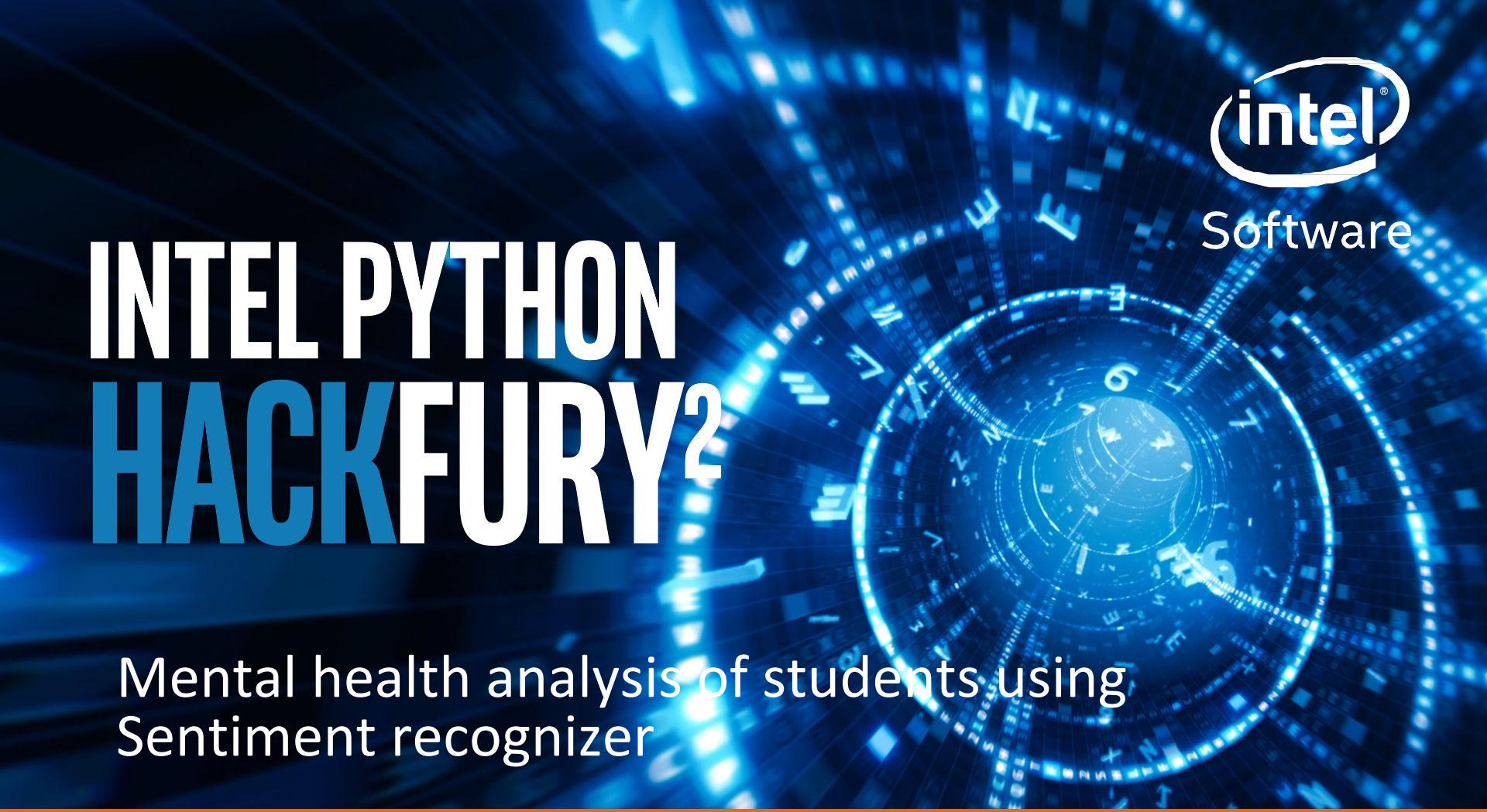

intel
Software
INTEL PYTHON
HACKFURY2
Mental health analysis of students using
Sentiment recognizer

Contents

Introduction

- Stress is the physical and mental response of the body to demands made upon it. It is the result of our reaction to outside events, not necessarily the events themselves.

- Numerous dead lines,multiple examinations and peer pressure can push students into a vicious cycle of severe stress.

The Problem

- Stress in students many times leads to psychological effects like problems with cognitive functioning, anxiety and depression.
- In a few cases, students may even take drastic steps.
- Cigna 360 Well-Being survey revealed that 95 percent of Indian millennials between the age group of 18-34 are stressed. One in eight Indians has serious trouble in dealing with stress. This is even worse in youngsters as they are not used to it.

Proposed Idea

- Consequences can be avoided by early detection of stress and assessment of mental health.
- Social media activity provides an insight into the mental state of the student
- Classroom behavior is also a valuable tool as students spend significant amount of their time in classes.
- We use the data generated by them for early detection of symptoms and offer assistance at the right time.

Our Solution

Functional Modules:

1. **Sentiment Analysis Model** - To understand the sentiment in the posts.

1. **Behaviour Analysis Model** - To understand the classroom behaviour of students.

1. **Chatbot** - To enable continuous emotional support and evaluation of students mental health.

Sentiment Analysis Module

- A deep learning based module which can classify sentences into categories ie. Negative and Positive(prototype)
- Uses transformer architecture(BERT) for classification task.
- Trained on twitter data on Intel NLP architect.

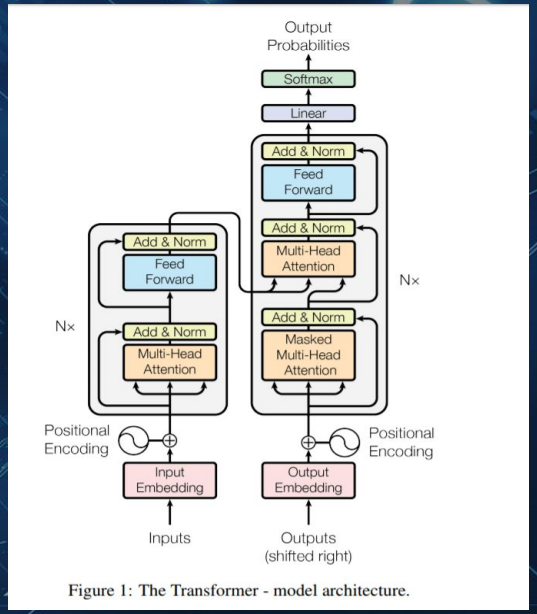


Figure 1: The Transformer - model architecture.

Behavioral Analysis Module

- A computer vision based module which can detect the attentiveness, emotion and drowsiness of students.

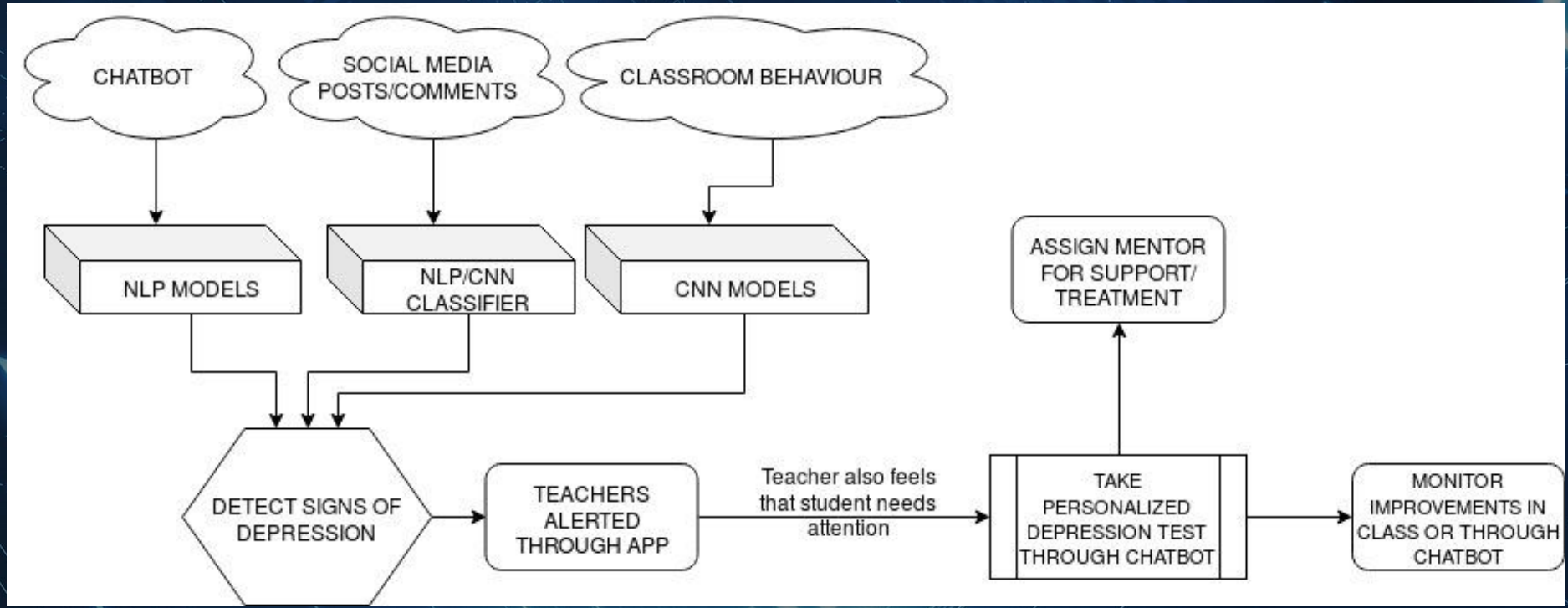
- Built using Intel OpenVINO toolkit. Standard models taken from Intel-OpenVINO model zoo.

Chatbot

- Conversational agent which provides emotional support during distress by thought provoking activities and administers standard tests for analyzing mental state of student.

- Uses sentiment analysis model for understanding students responses, later aggregates them to generate a final risk score.

Control flow



Advantages of Intel tools

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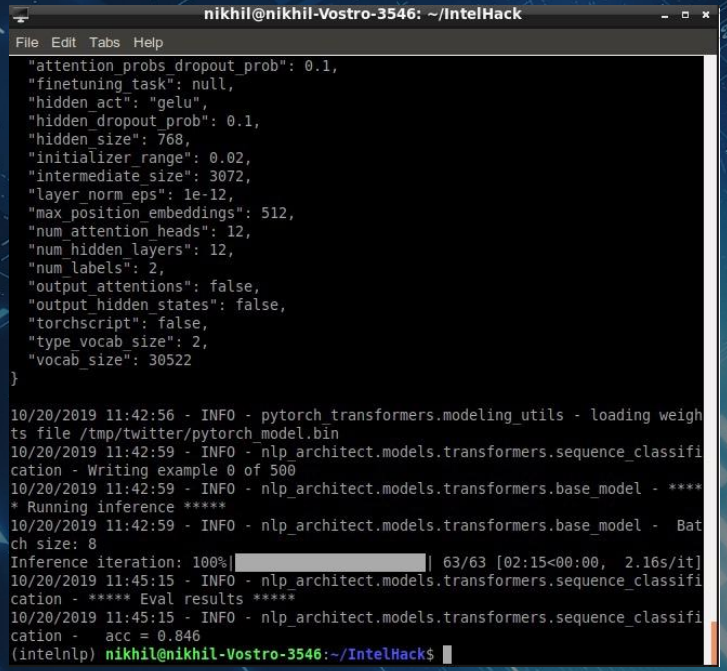
1. NLP architect provides a quick and easy way for prototyping state of the art architectures.

   LSTM based architecture - Training set - , Training time and accuracy.

   Bert based architecture implemented using NLP architect - Training set - , Training time and accuracy.

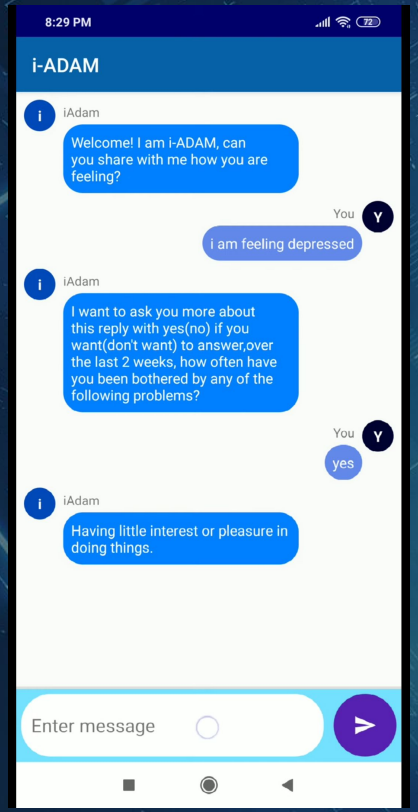
1. Open Vino has a plethora of pretrained models, openvino provides high throughput along with quick inference on heterogeneous platforms like cpu, intel-stick etc..
2. Openvino can be deployed on edge ie in mobiles . reduces privacy risk and inference time.

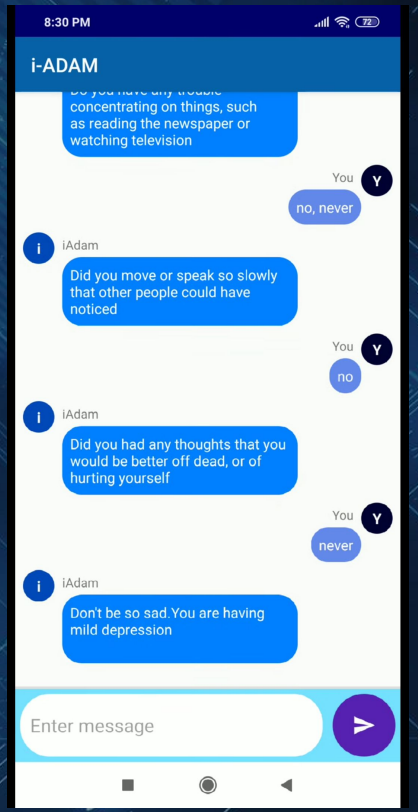
Demo - 1 Sentiment Analyser



Demo -2: OPENVINO Behaviour Analysis

Demo-3 Chatbot





Further Improvements

- Adding finer classes into sentiment recognizer model. Ie Anger, guilt, suicidal etc.
- Likes, comments and images can also be used for sentiment analysis.
- Behavioural model can be used for live feedback of class for teachers.
- Reports of psychologists can be analyzed and a machine learning based solution can be built for administering tests.
- Integration of study planners into chatbot for further ease of stress.