# Sentiment Analysis of Social Media Posts for Mental Health Assessments

Bathsheba Farrow and Sampath Jayarathna  
Department of Computer Science, Old Dominion University

## Introduction

- 40% of U.S. adults reported struggles with mental illness or substance abuse in 2020 [1]
- DSM–5 remains the standard for mental health assessments
- Surveys are reliant a subject’s honesty and ability to accurately verbalize symptoms
- Surveys are subject to doctor bias [2]
- Natural language processing (NLP) and sentiment analysis of written expressions provide clues for mental health state
- Research now includes social media posts

## Purpose

- Automate NLP and sentiment analysis of daily Facebook posts to:
  - Provide rapid mental health assessments
  - Generate reproducible results
  - Reduce or eliminate doctor bias
  - Support continuous monitoring
- Use pretrained models and transfer learning

## Methodology

- Downloaded two years of Facebook posts in JSON format.
- Custom Python code developed includes use of:
  - Natural Language Toolkit (NLTK), was written for text preprocessing.
  - DistilBERT used to perform sentiment analysis on the posts from each day [4]
  - Valence Aware Dictionary and sEntiment Reasoner (VADER) used to compute sentiment polarity scores [3].

## Results

<table>
<thead>
<tr>
<th>Activity</th>
<th>VADER</th>
<th>DistilBERT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events causing negative feelings</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Time spent alone</td>
<td>Negative</td>
<td>No trend</td>
</tr>
<tr>
<td>Event resulting in a loss</td>
<td>Neutral</td>
<td>Negative</td>
</tr>
</tbody>
</table>

- VADER & DistilBERT showed a correlation between a surge in negative sentiments and events causing negative feelings (e.g., arguments).
- Only VADER classified more posts as negative during time spent alone

## Future Work

- Expansion of the study with a larger group
- Model fine-tuning & extensive data analysis
- Examine subjects’ posting frequency, emoji and symbol use, “likes” & expression methods

## References