

# Detection of Suicidal Ideation from Text using Artificial Intelligence

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Text	Label
I just break up with my girlfriend. If u hear any news concerning a suicide, then it's her	Non-Suicidal
I can't stand by and watch him die	Non-Suicidal
Fishing in stardew valley makes me want to kill myself	Non-Suicidal
Suicide is an option and the one that I wanna take	Suicidal
I want to die, I want to disappear, there's nothing let for me here. There's no more hope in a life like this	Suicidal
I should just kill myself and save everyone their headache	Suicidal

## Project Objectives:

This project aims to design a Natural Language Processing (NLP) model that could analyze social media text and detect any indicators of suicidal ideation. Specifically, machine learning algorithms and NLP techniques were used to identify patterns and keywords in social media posts that were associated with suicidal thoughts. The goal was to create a reliable and accurate tool that could be used to screen social media activity for signs of potential suicide risk and provide timely intervention and support to those in need.

## Methodology:

- 1) Text Representation:** Bag-of-Words (BoW), Term Frequency-Inverse Document Frequency (TF-IDF), GloVe Embedding
- 2) Machine Learning Models:** Naïve Bayes, Logistic Regression, Decision Tree, Random Forest, Support Vector Machine
- 3) Neural Network Models:** Multi-Layer Perceptron (MLP), Convolutional Neural Network (CNN), Recurrent Neural Network (RNN), Long Short-Term Memory (LSTM), Gated Recurrent Unit (GRU), Bidirectional Long Short-Term Memory (BiLSTM), Bidirectional Gated Recurrent Unit (BiGRU)
- 4) Transfer Learning:** Zero-Shot Learning, Fine-tuning Transformers
- 5) Ensemble Learning:** Majority Voting

## Twitter Bot Integration:



With the best performing model, a Twitter bot was developed to identify tweets with suicidal ideation and provide information about available resources.

### Steps taken by Twitter Bot:

- 1) Retrieval of Tweets
- 2) Classification of Tweets
- 3) Respond to Tweets that are classified as suicidal

### Advantages:

- 1) Proactive means of identifying suicidal individuals
- 2) Leverages widespread use of social media among adolescents