Multi-Dimensional Sentiment Analysis

Jenna, Roger, Rudy, Aniket

Research Question

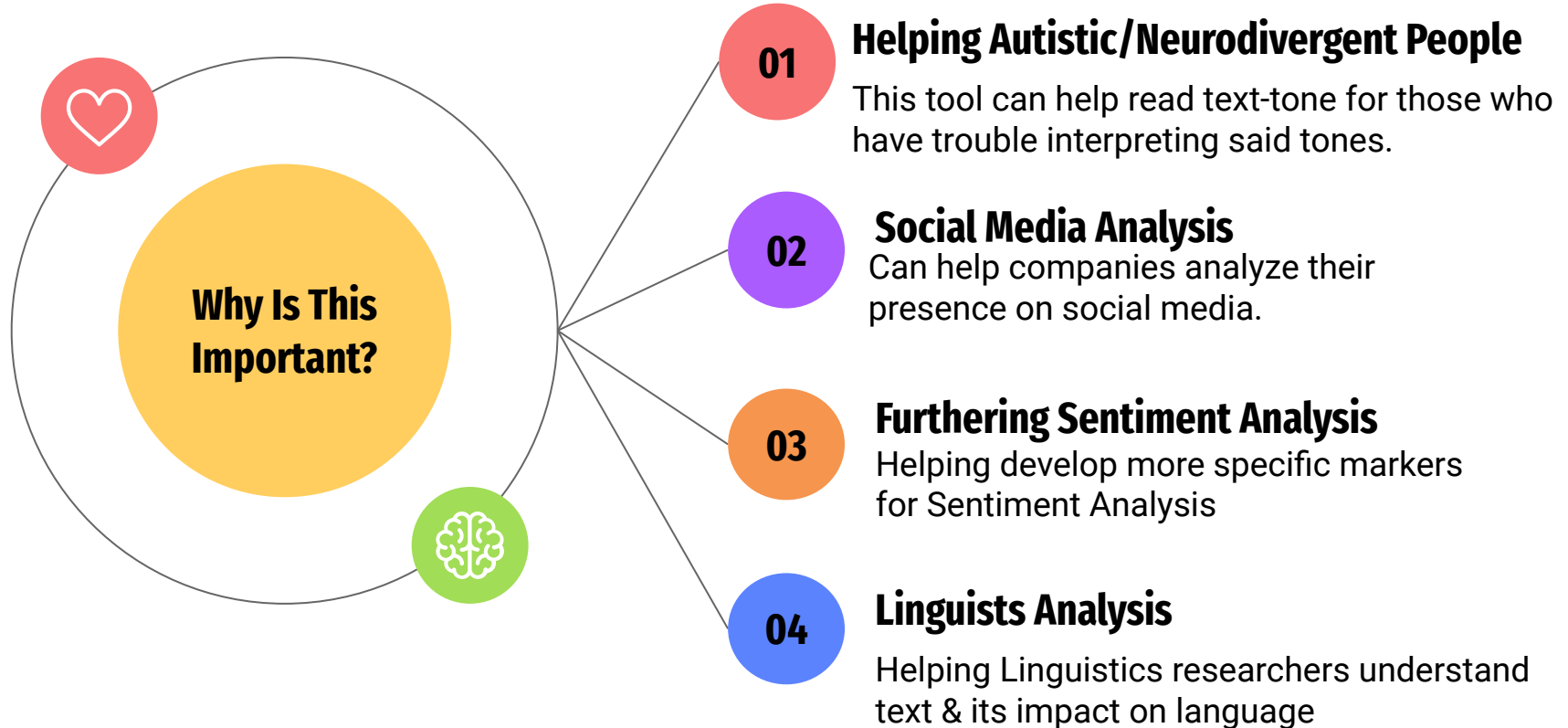**Happy**

Fear

Positive

Research Question:

How much more can sentiment analysis infer to predict emotions (rather than positive/negative) within a given English text, regardless of their background and level of education?

Negative

Sad

Angry

Importance

Why Is This Important?

01 Helping Autistic/Neurodivergent People
This tool can help read text-tone for those who have trouble interpreting said tones.

02 Social Media Analysis
Can help companies analyze their presence on social media.

03 Furthering Sentiment Analysis
Helping develop more specific markers for Sentiment Analysis

04 Linguists Analysis
Helping Linguistics researchers understand text & its impact on language

Datasets

Datasets:

Our goal is to be able to predict a tone based on a given text.

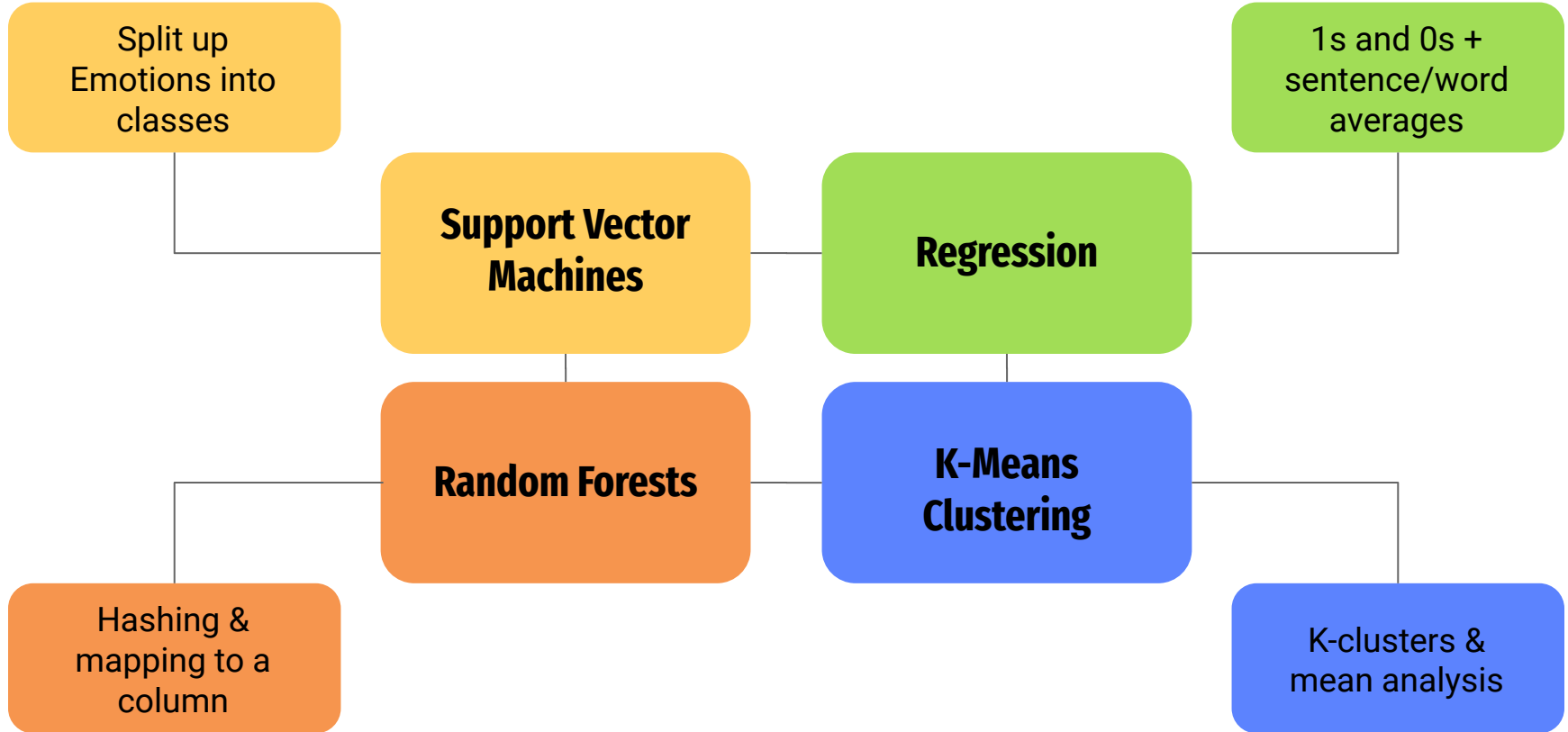**"Sentiment Analysis Word Lists Dataset"**
By PRAJWAL KANADE

This kaggle database contains 2 files: a list of negative words and a list of positive words.

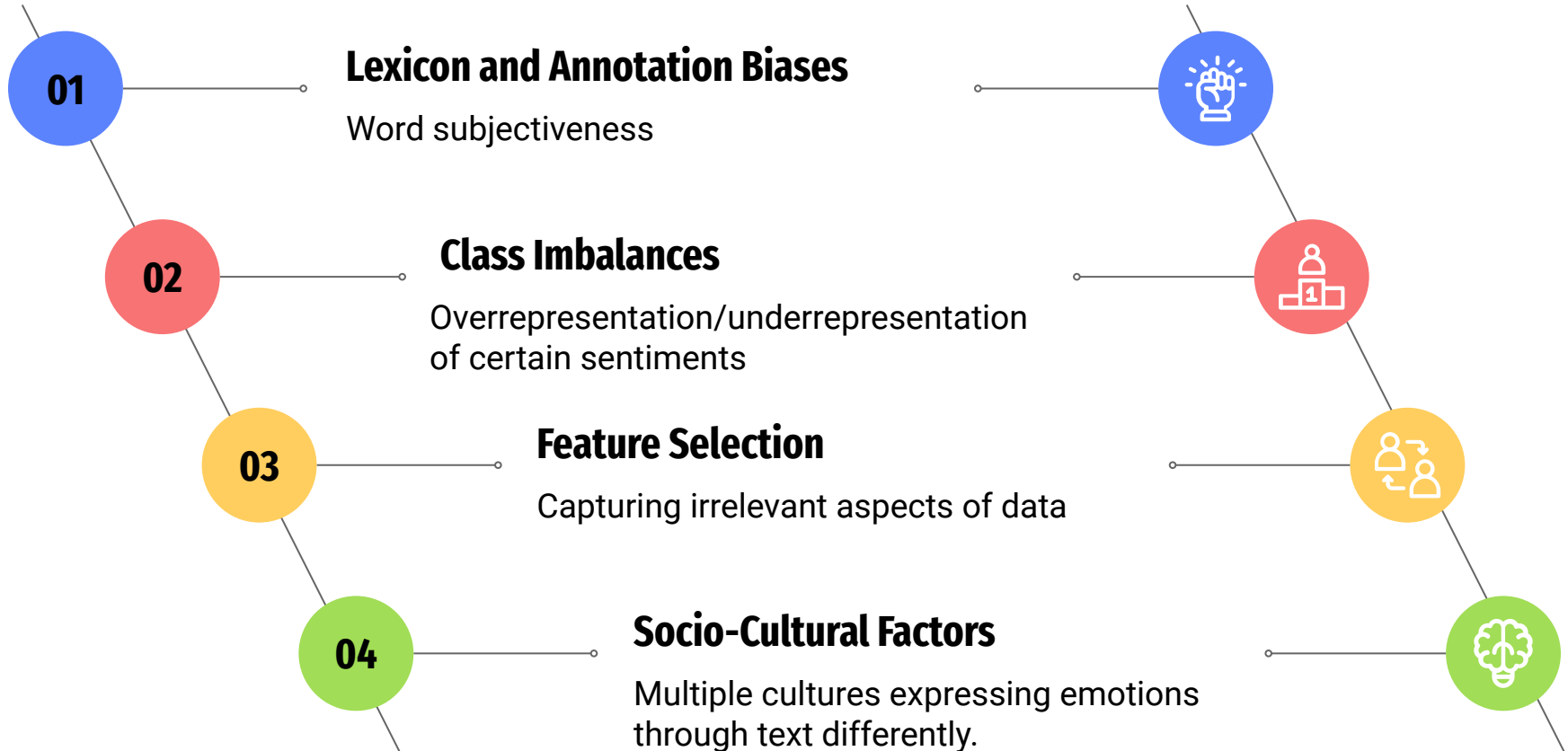**"Emotion Dataset for Emotion Recognition Tasks"**
By PARUL PANDEY

This kaggle database contains one file with text & an emotion associated with the text; there are 6 emotions to be identified.

Machine Learning Algorithms

Split up Emotions into classes

1s and 0s + sentence/word averages

Support Vector Machines

Regression

Random Forests

K-Means Clustering

Hashing & mapping to a column

K-clusters & mean analysis

Sources of Bias

01 — **Lexicon and Annotation Biases**

Word subjectiveness

02 — **Class Imbalances**

Overrepresentation/underrepresentation of certain sentiments

03 — **Feature Selection**

Capturing irrelevant aspects of data

04 — **Socio-Cultural Factors**

Multiple cultures expressing emotions through text differently.

AI Impact/Ethics

Good Impact
✓ Helping Neurodivergent People
✓ Accessible AI for all

Bad Impact
✓ Can be inaccurate and thus cause a rift between people.

✓ Business side: being able to interpret if customers are happy or not

✓ On the business side, could cause stocks to go down, etcetera.

Summary

01

Text & Tone

It's important to explore text & tone.

02

Sentiment Analysis

Supervised M.L. Algorithms.

03

Bias

Unavoidable, unfortunately.

04

Good Impact (hopefully)

It was made with good intent.

Sources!

01 — A Survey of Sentiment Analysis: Approaches, Datasets, and Future Research

02 — Emotion Detection and Sentiment Analysis in Text Corpus: A Differential Study with Informal and Formal Writing Styles

03 — Multi-Dimensional Sentiment Analysis with Learned Representations

04 — Current State of Text Sentiment Analysis from Opinion to Emotion Mining

05 — A review on sentiment analysis and emotion detection from text

06 — Sentiment Analysis vs Emotion Detection: what is the difference?

07 — Beyond Sentiment Analysis: A Review of Recent Trends in Text Based Sentiment Analysis and Emotion Detection