

# Who shot Mr.Burns?

An emotion detection project in The Simpsons

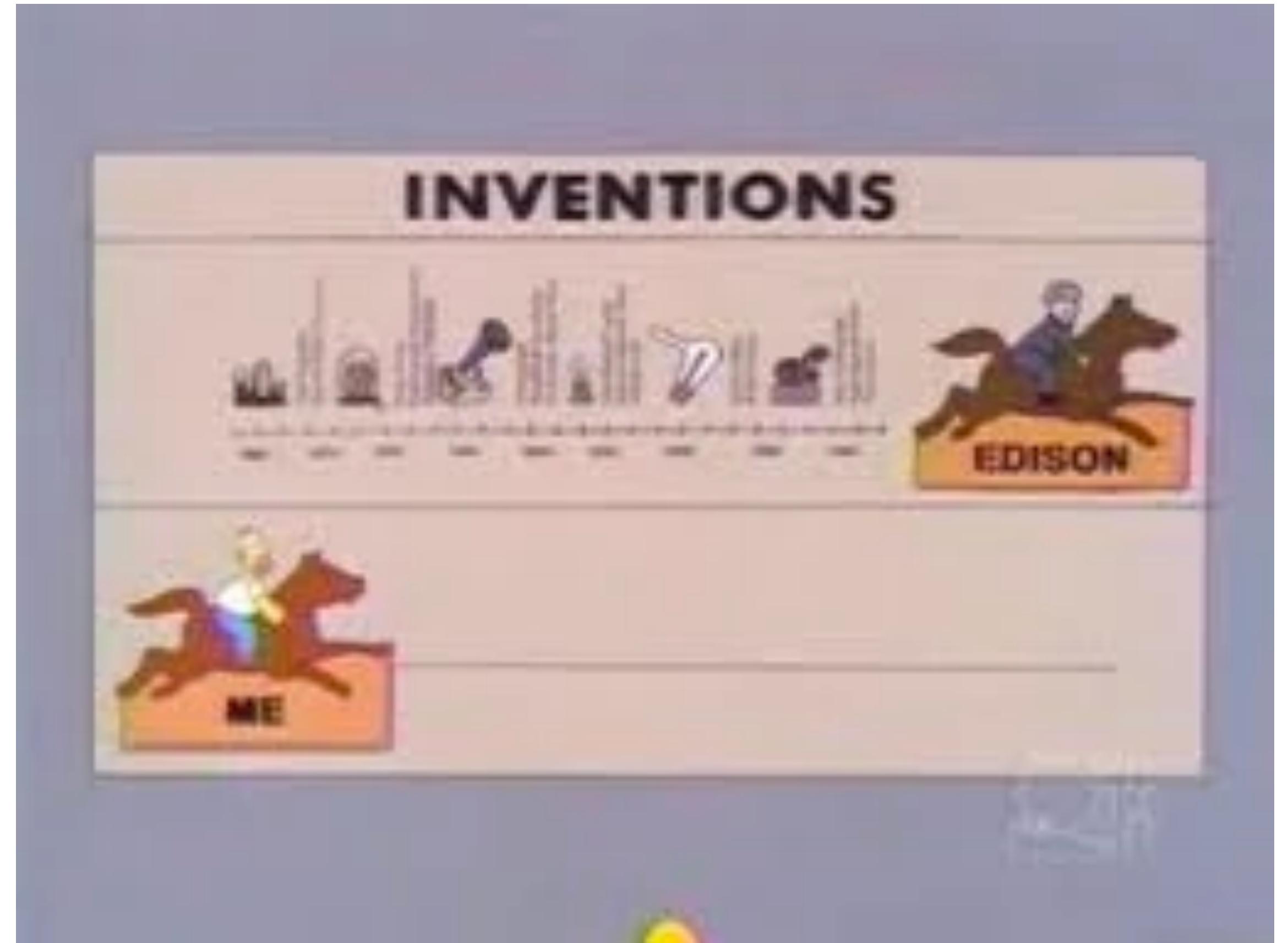
Project work for Text Mining and Sentiment Analysis course  
William Biondi



# Main Goals

Use Language Models to detect emotions from fiction textual data

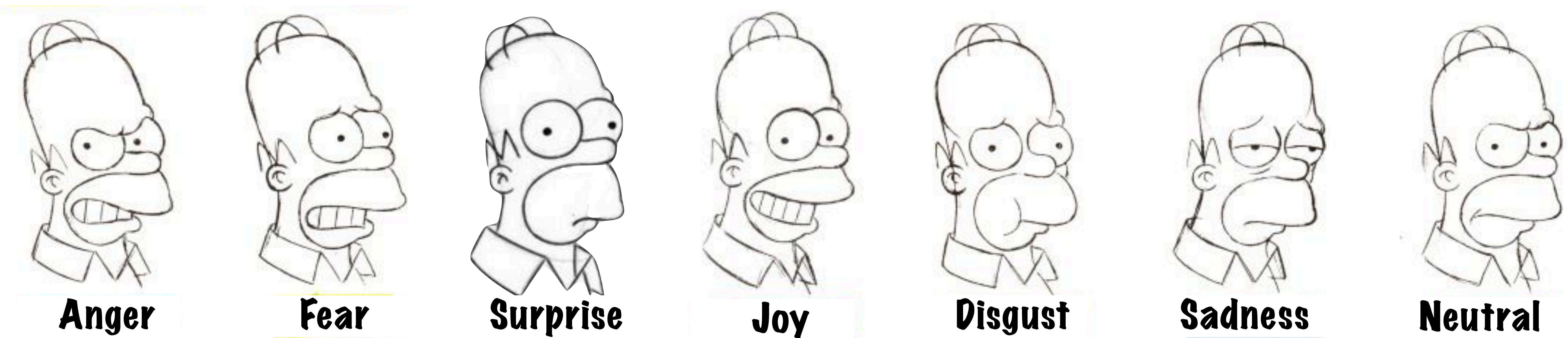
- Define an **emotional profile** for each character
- Study the **evolution** of the emotional profiles over the plot
- Study the **emotional interactions** between the characters



# Emotions

“An emotion is a complex psychological state triggered by stimuli, influencing our actions, behaviour, and decision-making”

- The study of emotion is considered crucial since they help in engagement with the spectators and identifies key moments in the story
- According to Paul Ekman's categorical model, there are six basic emotions
- If the valence or arousal of an emotion is diminishing we approach a neutral setting which is introduced in the James Russell's dimensional model



# Data

Script from episodes 128 and 129 of The Simpsons where each observation provides:

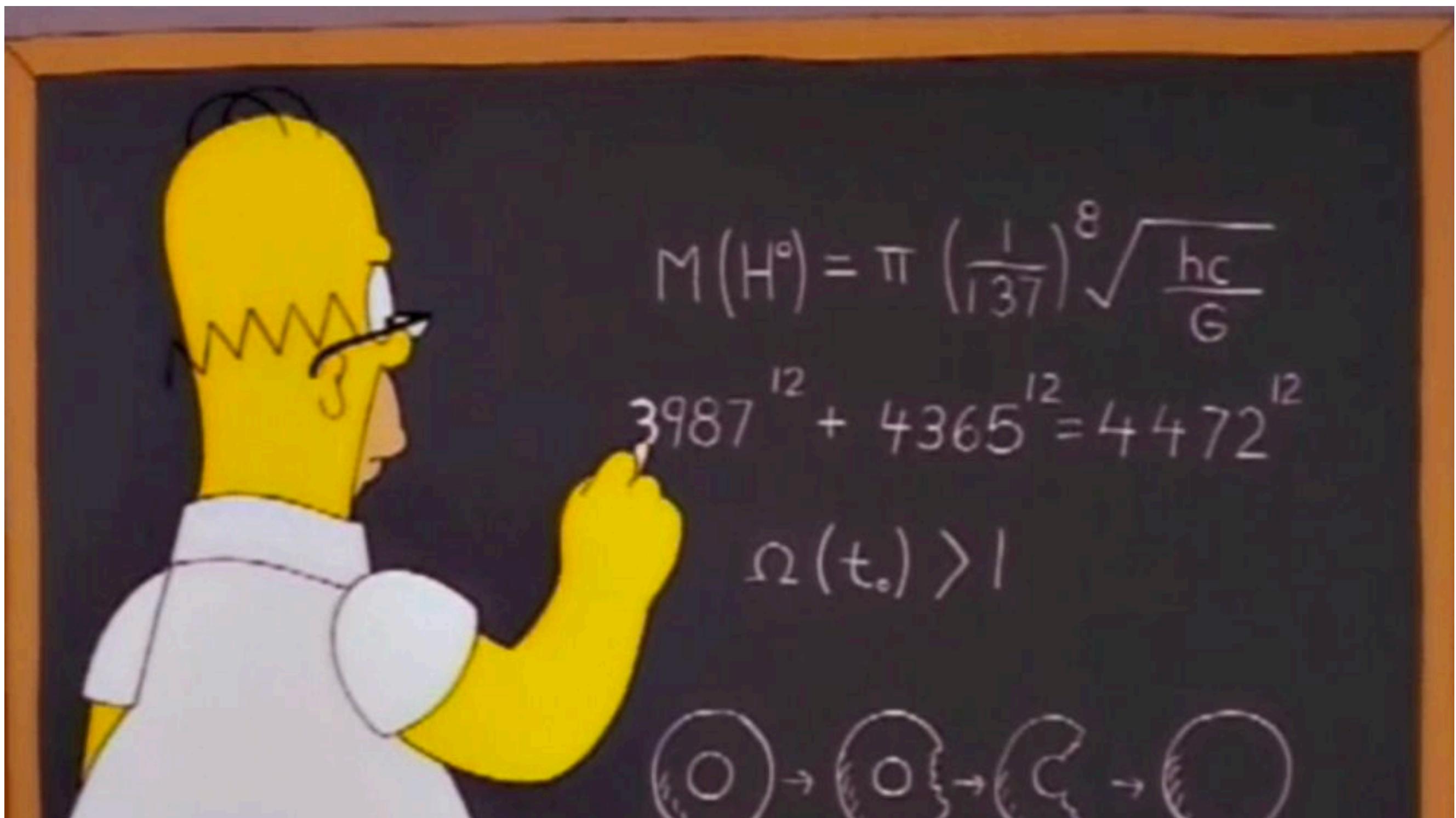
- Episode number
- Line number
- Character
- Spoken words
- Scene number (added later)
- Character referenced (added later)



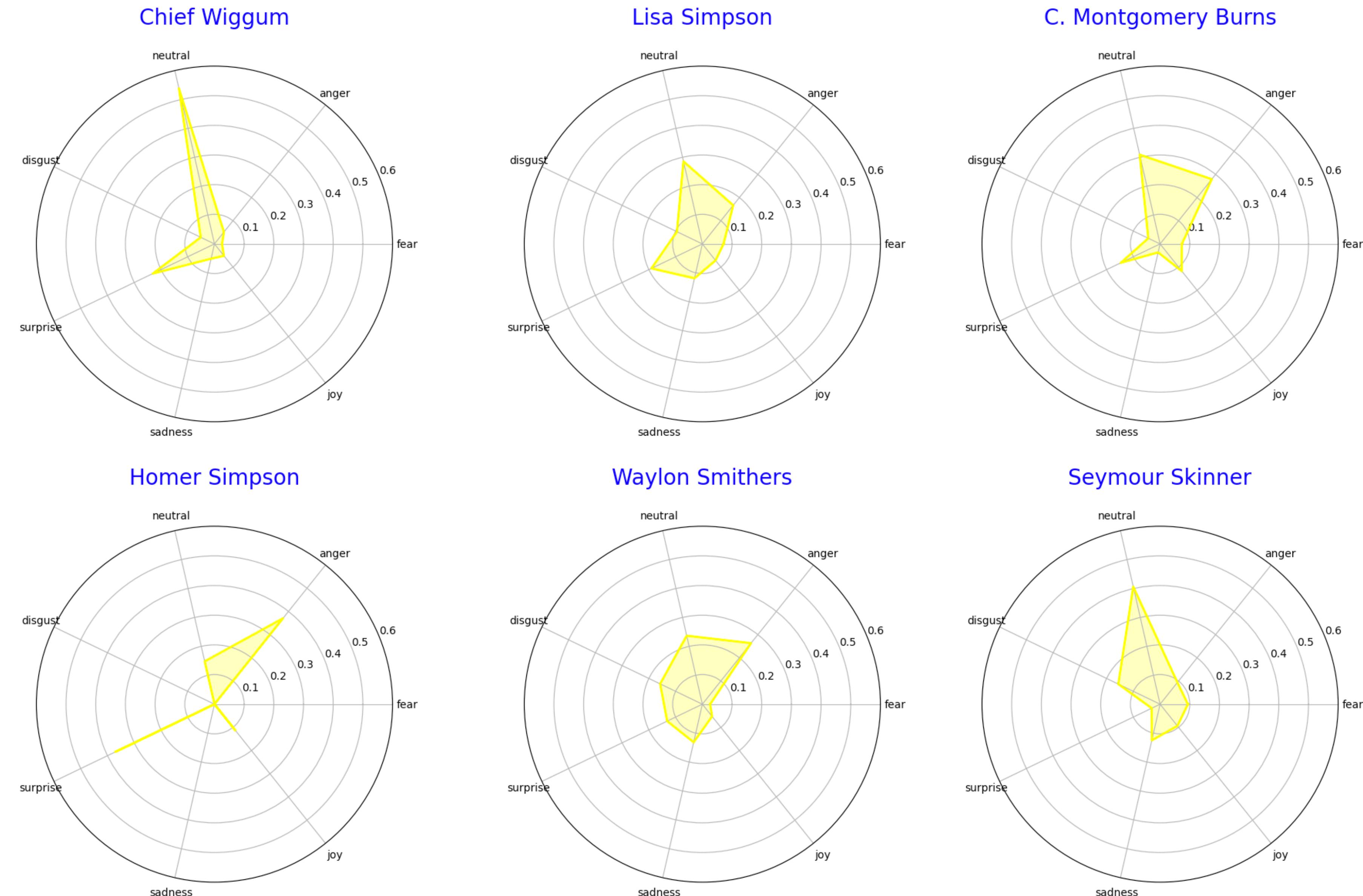
# Methodology

Emotion detection is performed by  
“emotion-english-roberta-large” made by  
J.Hartmann

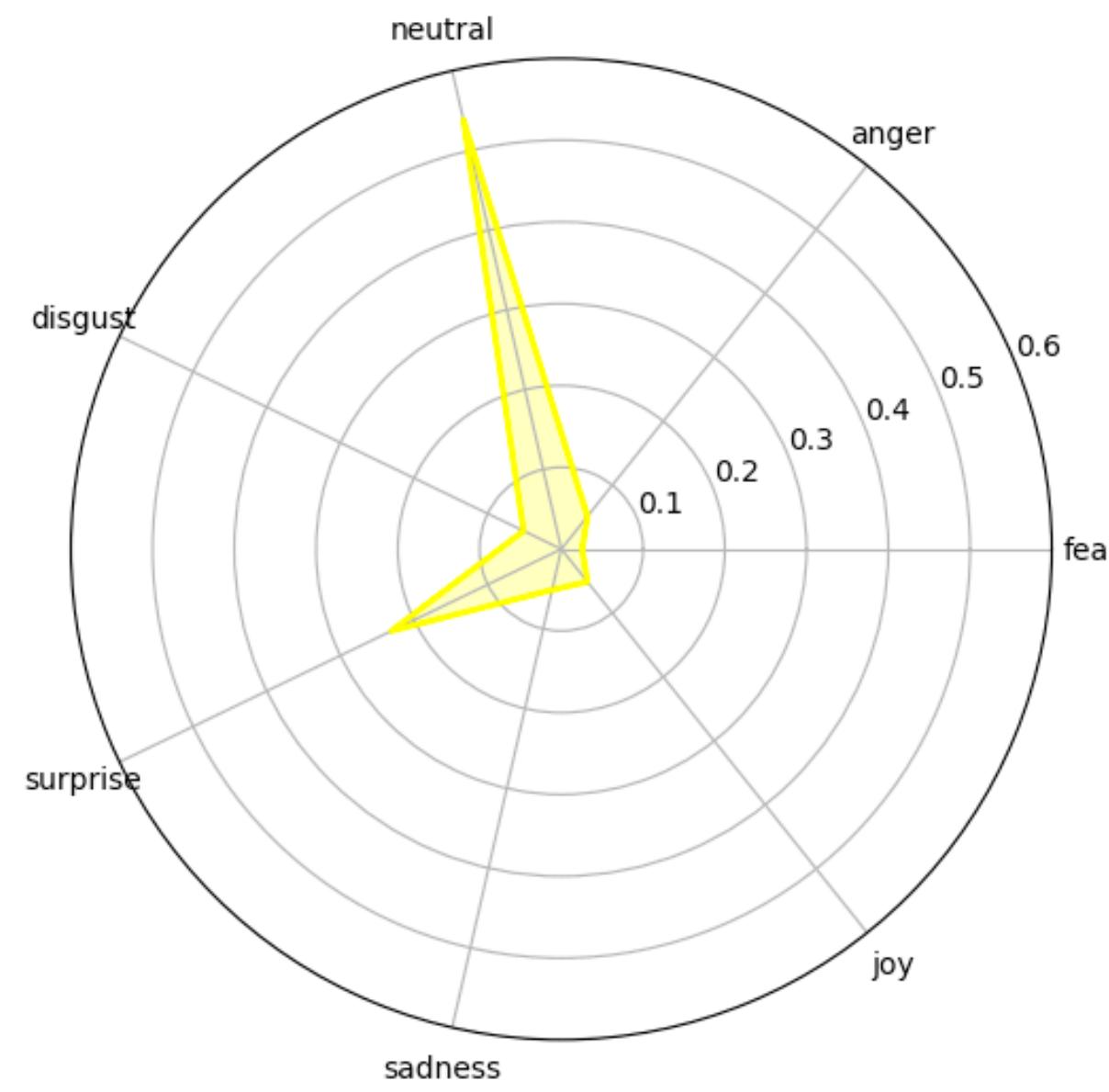
- This **transformer** given a text as input return the six basic emotions's **scores** plus a neutral
- To **enhance emotions** a score difference **threshold** is applied in every case where neutral emotion has the highest score



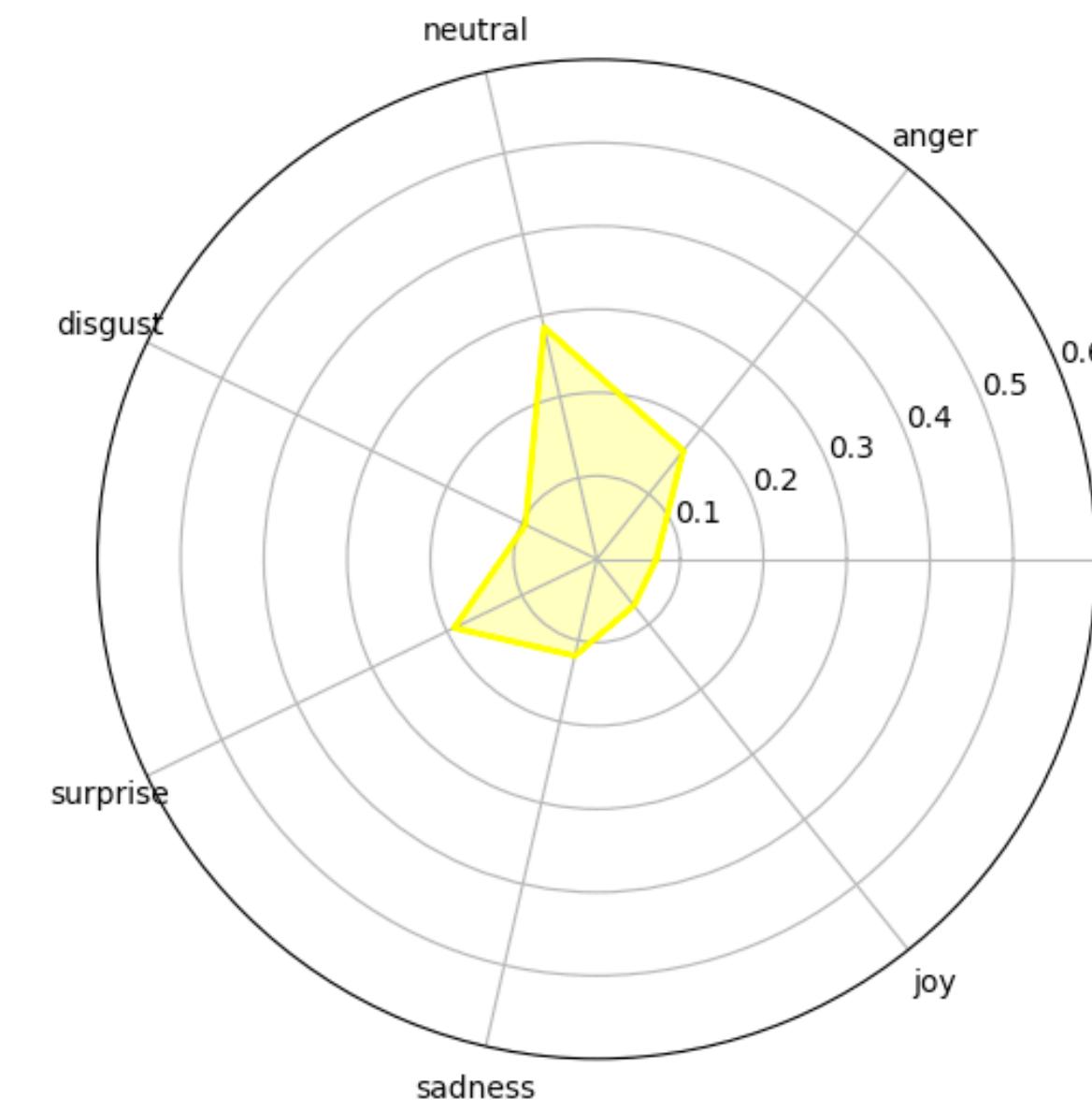
# Results - Emotional Profiles



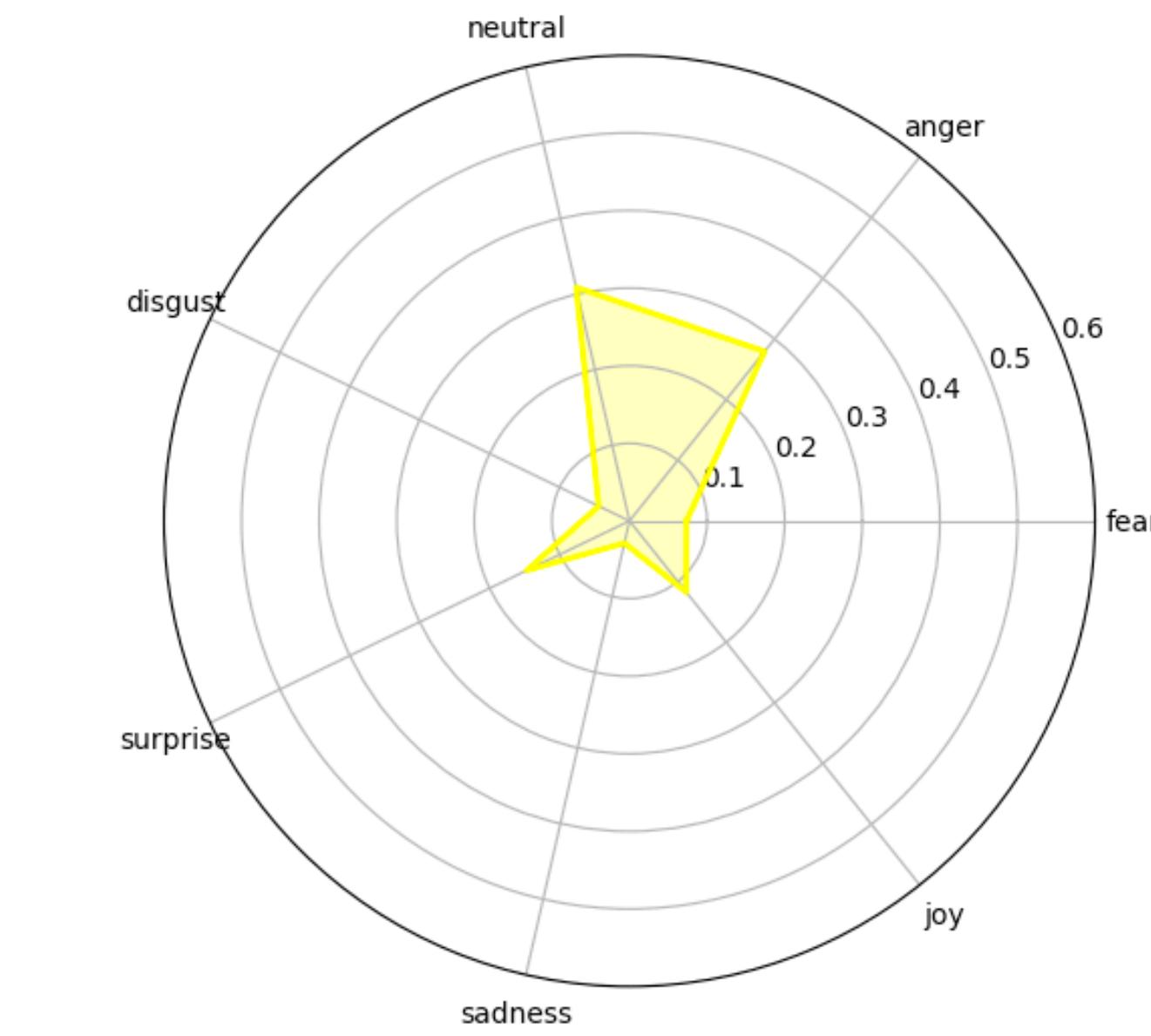
Chief Wiggum



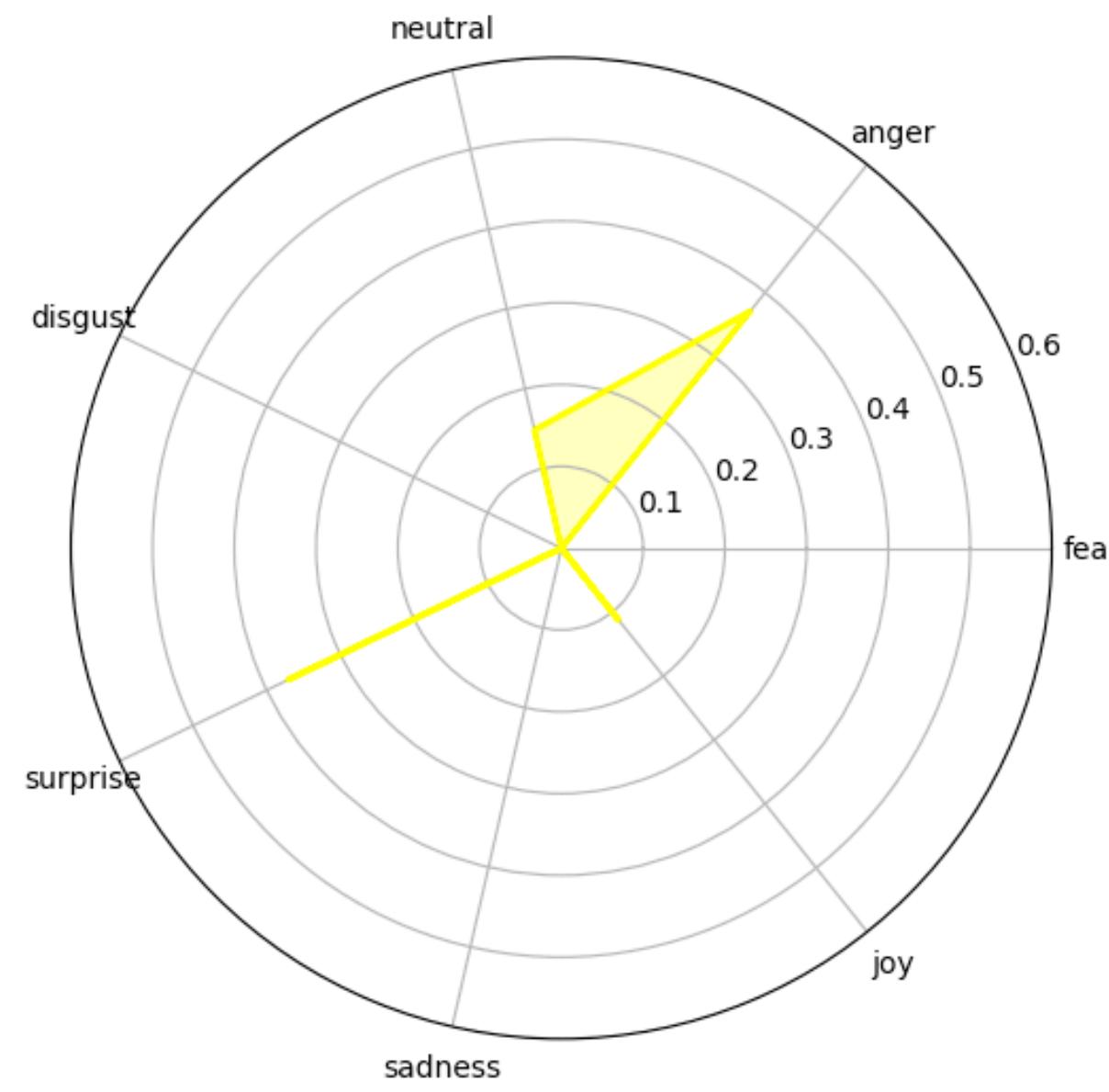
Lisa Simpson



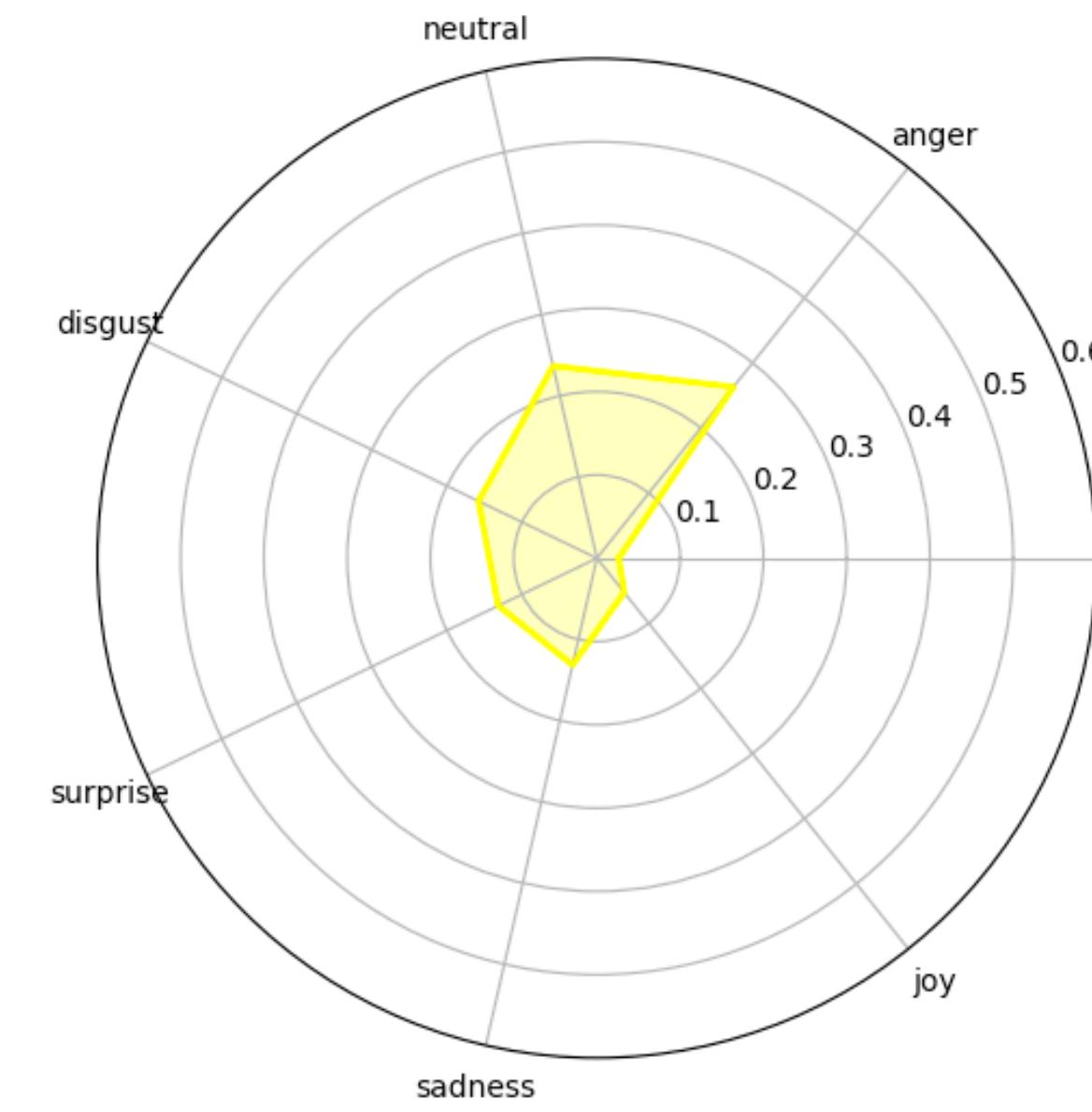
C. Montgomery Burns



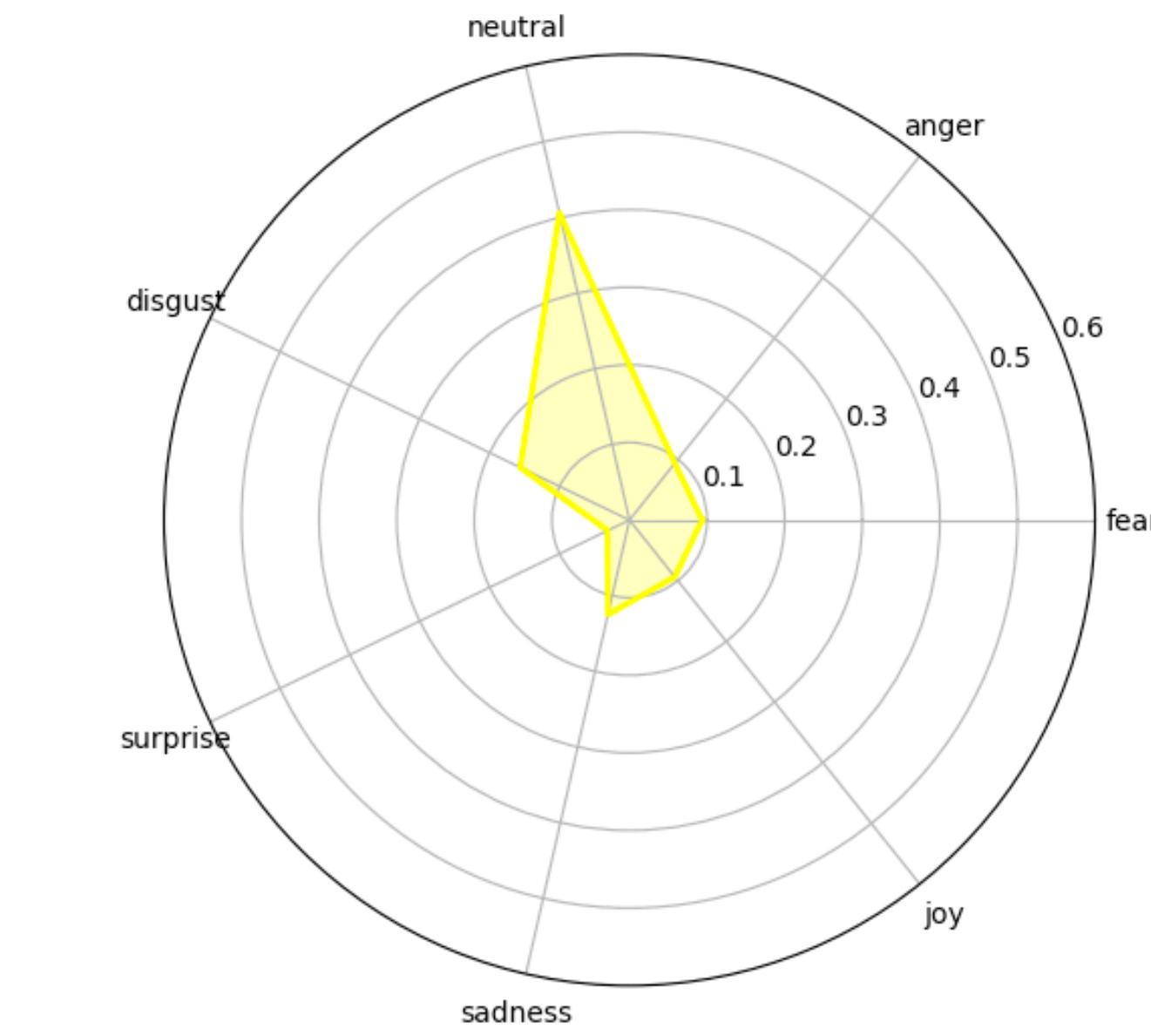
Homer Simpson



Waylon Smithers

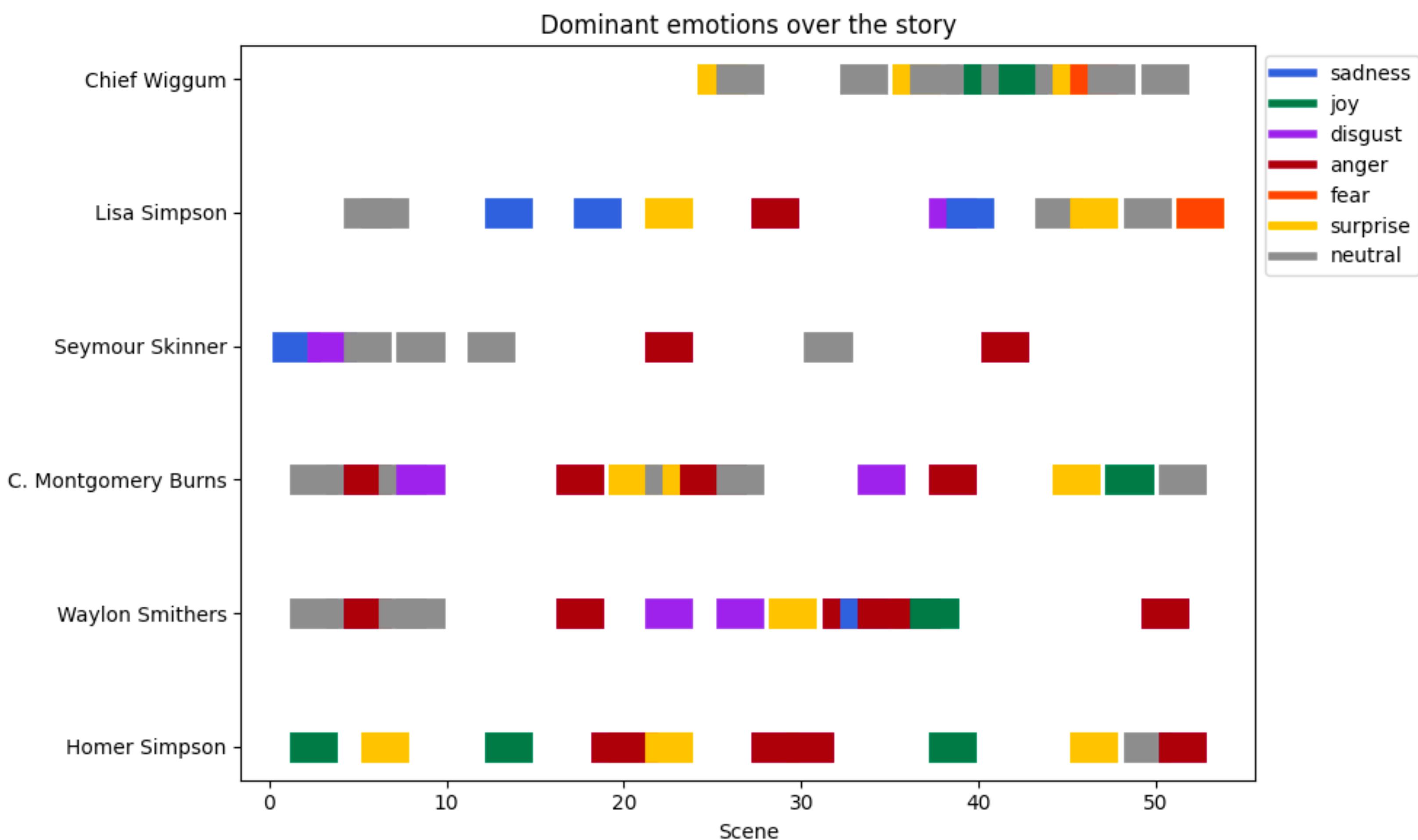


Seymour Skinner



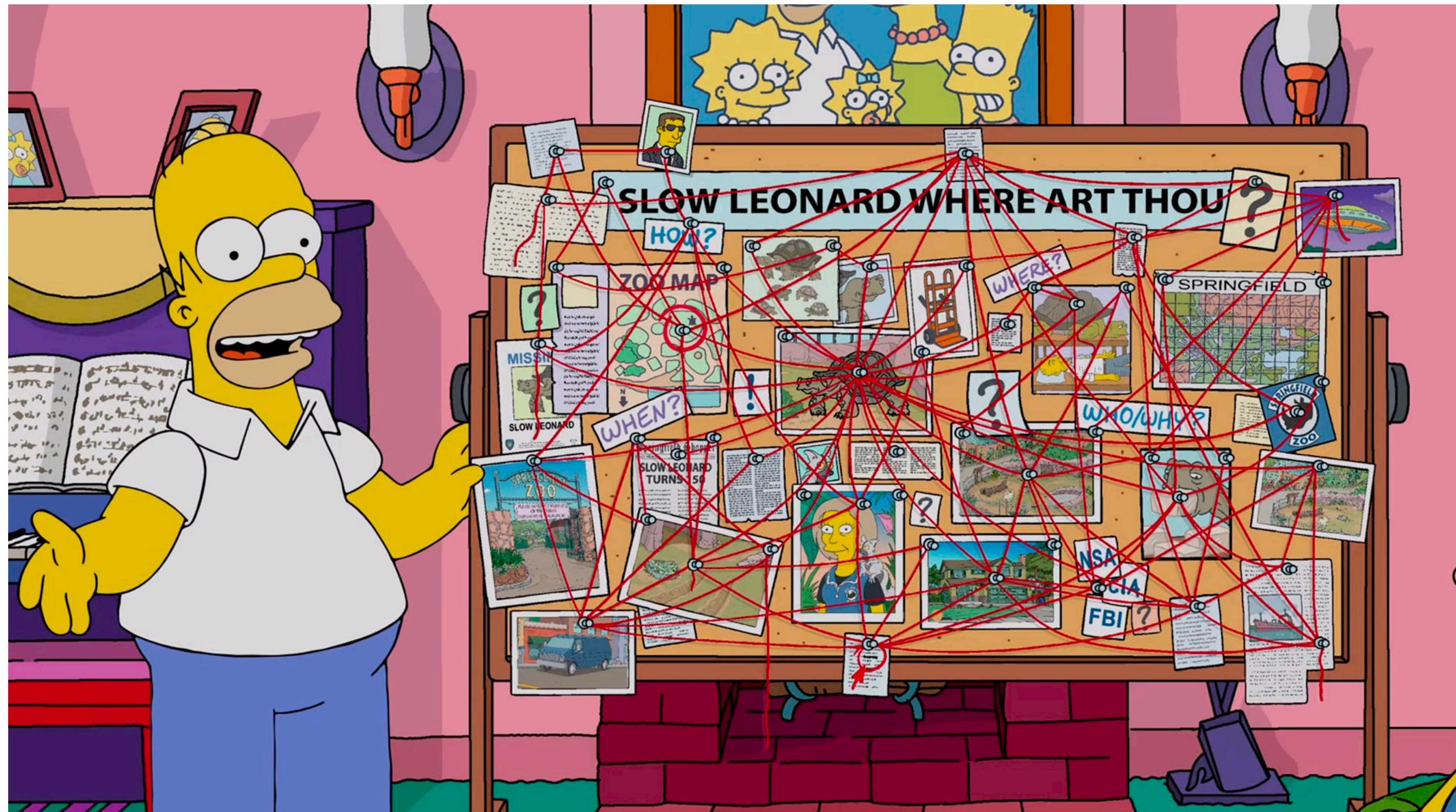
# Results - Emotional Profiles

# Evolution throughout the story



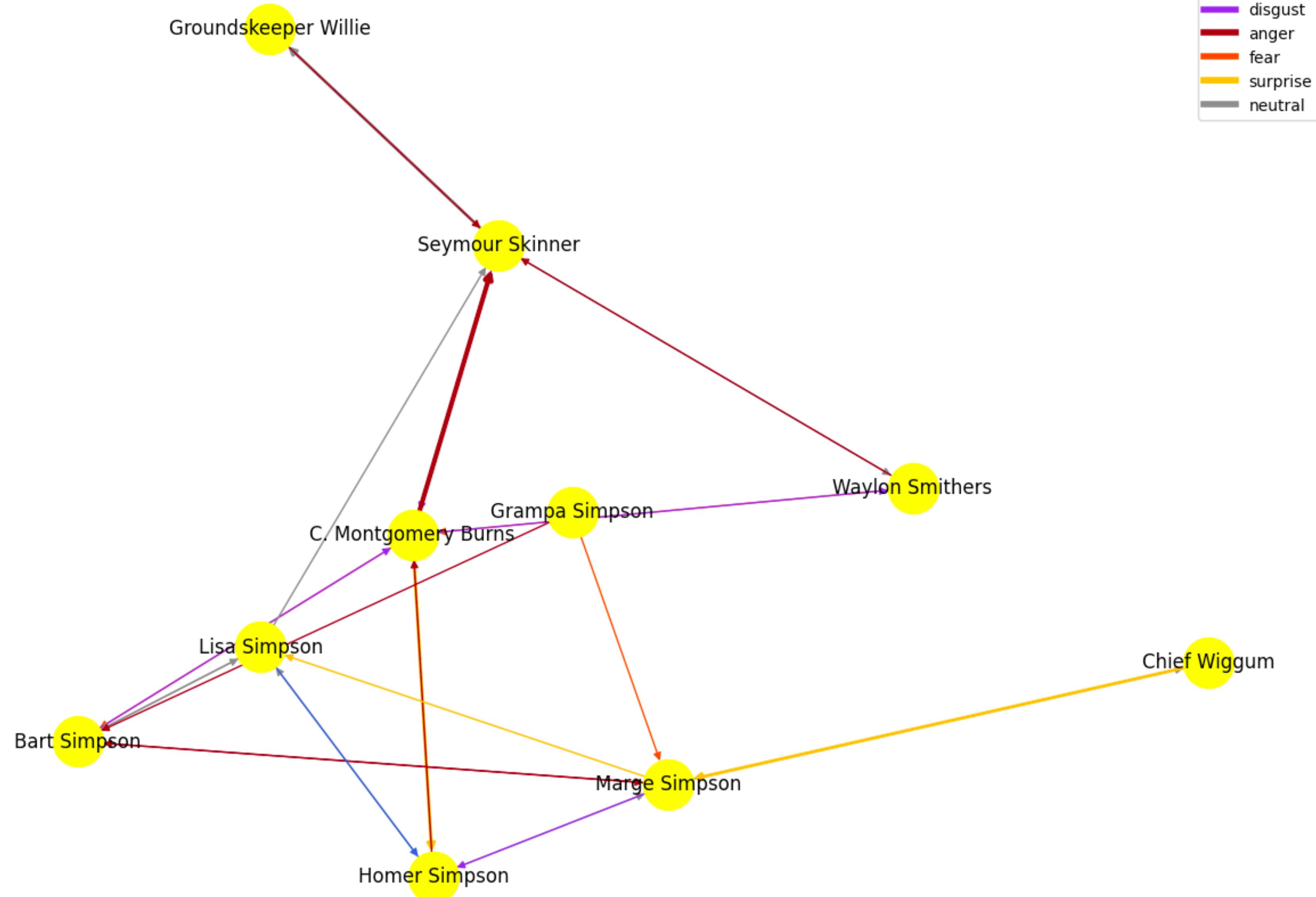
# Interactions

To study interactions between characters we consider them as **nodes** of a graph and as **edges** the lines spoken from characters which refers to another character, plus an **attribute** for the detected emotion



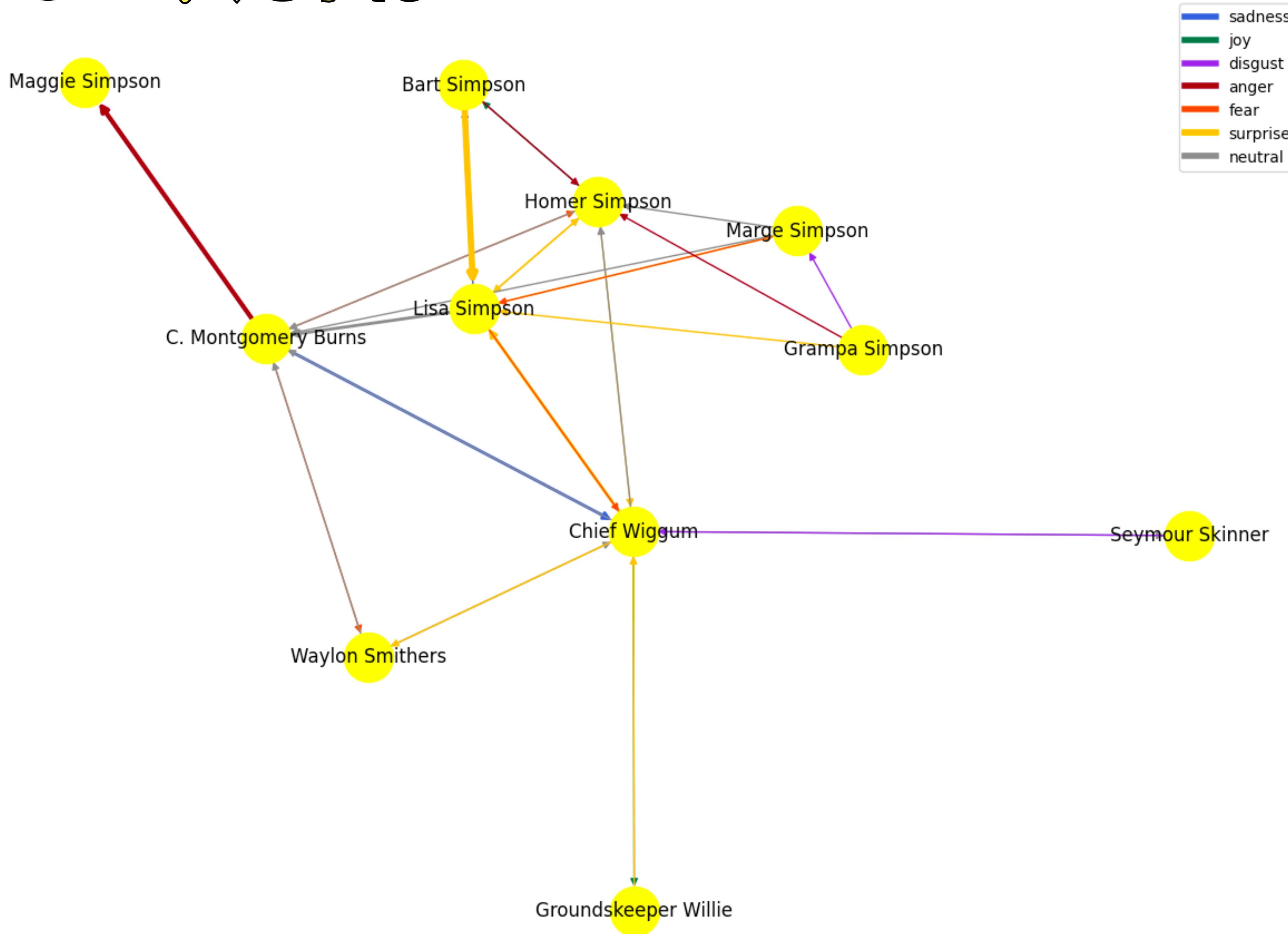
# Interactions

## Part 1



# Interactions

## Part 2



# Conclusions

- ◆ The emotion detector generally aligns with the story's anticipated plot.
- ◆ The series contains side gags, flashbacks, and other elements; detected emotions may not always relate to the main plot.
- ◆ Some emotions detected might stem from humorous side gags, which don't hold the same emotional gravity as primary events.

## Further Studies:

- ◆ Refine the language model to better recognize patterns in episodes, such as side gags and flashbacks.
- ◆ Collaborate with viewers to compare detected emotions with audience perceptions using annotated scripts.