

Analyzing Public Sentiment on Controversial Sports Events in YouTube Comments

1 Annotation Pipeline and Fine Tuning Details

1.1 Algorithm Details and Rationale

The following outlines the overall pipeline and reasoning behind our stance detection approach:

- **Pipeline Design:** The pipeline starts with data extraction and preprocessing to ensure the quality of the input comments. Given the noisy nature of social media data, thorough cleaning was essential.
- **Model Selection:** For the Underarm Incident, the fine-tuned LLaMA-3.1 (Instruct) family of models were chosen for its ability to process long sequences (up to 2048 tokens) and follow the given instructions (as a few shot prompts) to generate coherent responses, making it suitable for detailed stance detection.
- **Structured Prompts:** We used structured prompts to guide the model in classifying comments. This method provided consistent JSON responses, ensuring ease of parsing and reliable extraction of stance labels and reasons.
- **OLLAMA Framework:** For Jonny Bairstow's and Ashwin's events, the OLLAMA framework allowed for scalable and concurrent processing of comments via API calls. This was critical in handling larger datasets and ensuring a rapid turnaround in analysis.
- **Evaluation Metrics:** In addition to the stance labels, we compute evaluation metrics such as accuracy, precision, recall, and F1-score to assess model performance.

Figure 1 presents a flowchart summarizing the stance detection pipeline. For clarity, the pseudocode in Algorithm 1 summarizes the pipeline:

Algorithm 1 Stance Detection Pipeline

- 1: **Input:** YouTube comments dataset
 - 2: **Preprocessing:** Clean comments by removing noise and duplicated data
 - 3: **if** Incident is Underarm **then**
 - 4: Use the Unsloth LLaMA-3(Instruct) family of models with a structured prompt
 - 5: Parse JSON response to extract stance label and reason
 - 6: **else**
 - 7: Use the OLLAMA framework with API requests and detailed prompts
 - 8: Parse JSON response to extract stance label and reason
 - 9: **end if**
 - 10: **Output:** Stance labels and evaluation metrics (accuracy, precision, recall, F1-score)
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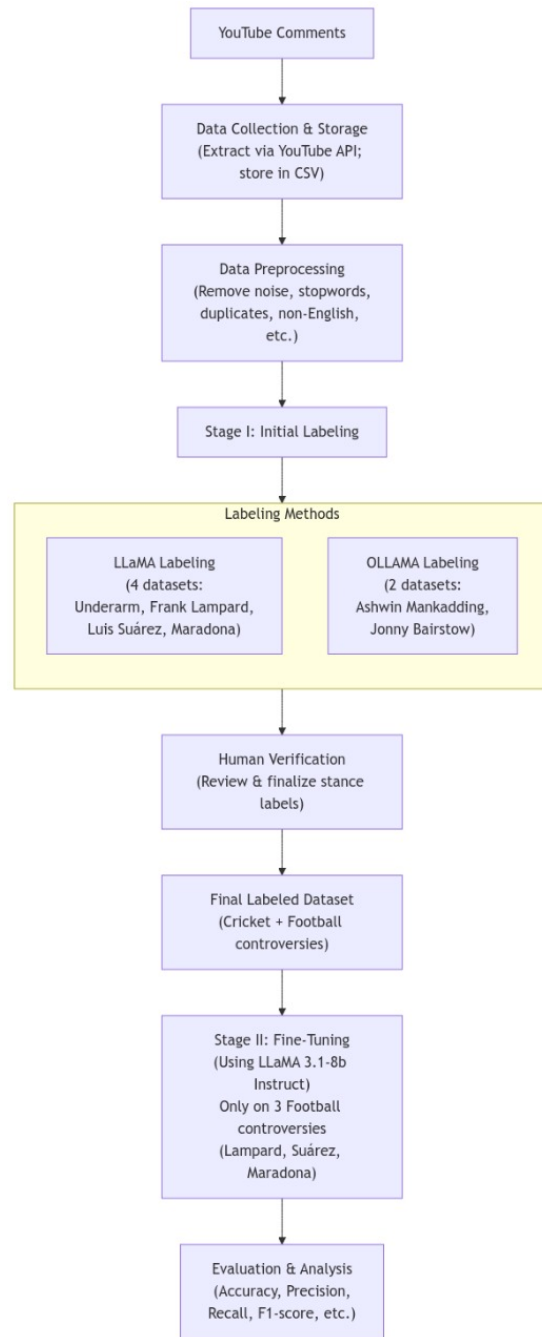


Figure 1: Opinion Mining Pipeline Flowchart