Assessing Reliability of Annotations in the Context of Model Predictions and Explanations

ADS Grant Roadmap

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February 7, 2024

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Dataset

- EXIST
- SemEval 2023 - Task 10
- SemEval 2023 - Task 11

Dataset	Strengths	Weaknesses
EXIST	Multi annotators (data available) Other information about annotators (Gender/Age) Different levels of Sexism detection In Spanish and English	Not clear structure (we can ask)
SemEval 2023 - Task 10	Multi annotators (data not available) Clear structure and document (available)	Data of annotators is not public (we can ask)
SemEval 2023 - Task 11		

Table: Strengths and Weaknesses of Datasets

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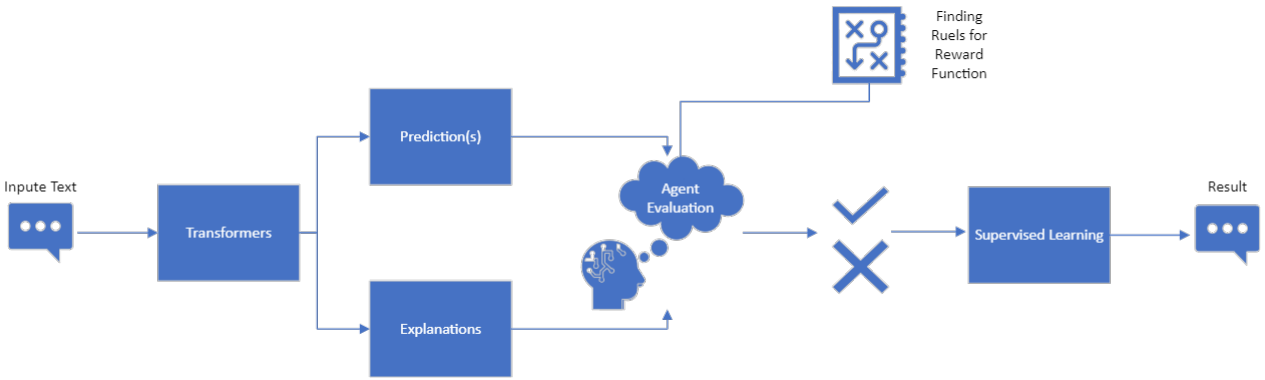
Proposed Model Structure

- The project will employ transformer models, such as BERT, for prediction.
- SHAP (SHapley Additive exPlanations) will be used to identify influential tokens or phrases for generating explanations.
- An A/B testing framework will be established to evaluate the impact of model explanations on annotator agreement.



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Phases (1)

1. **Data Preparation (Months 1-2):**
   - Access and preprocess the selected datasets (EXIST, SemEval Task 10/11). **[Assistant]**
   - Access and read the structure of Annotations. **[Assistant]**
   - Work on the model structure that provides both prediction and explanation.

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Phases (2)

2. **Annotation and Calibration (Months 3-4):**
   - Make a survey structure suitable for our model. **[Assistant/Consultant]**
   - Find a proper platform and create the survey. **[Assistant]**
   - Annotate a subset of data with multiple annotators.
   - Implement a structured training and calibration process for annotators.

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Phases (3)

3. **Model Integration and Prediction (Months 5-6):**
   - Utilize transformer models (e.g., BERT) for prediction on annotated data.
   - Generate explanations using SHAP for model predictions.

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Phases (4)

4. **Annotator Agreement Analysis (Months 7-8):**
   - Calculate Inter-rater Reliability (IRR) metrics (e.g., Cohen's Kappa) for annotator consensus.
   - Analyze confusion matrices to identify agreement patterns.

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Phases (5)

5. **A/B Testing (Months 7-8):**
   - Conduct A/B testing with two groups of annotators: one with model predictions and another with both predictions and explanations.

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Phases (6)

6. **Feedback Mechanism (Months 9-10):**
   - Implement a feedback mechanism for annotators to report ambiguous or unclear predictions and explanations.
   - Assess systematic bias and sensitivity to explanation types.

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Phases (7)

7. **Data Analysis and Reporting (Months 9-10):**
   - Perform statistical analysis of annotator responses. **[Assistant]**
   - Examine the impact of explanations on annotator agreement.
   - Prepare a research paper and final report.

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Metrics

- Metrics include Inter-rater Reliability (IRR) metrics (e.g., Cohen's Kappa, Fleiss' Kappa, Krippendorff's Unitizing Alpha) to measure annotator consensus.
- A confusion matrix will be used to identify agreement patterns, especially False-Positive and False-Negative cases.

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Output

1. Quantitative measure of annotator agreement.
2. Research paper reporting the influence of model explanations on annotator agreement.
3. Feedback analysis to improve model predictions and explanations.

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Next steps

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