

CONVERSATIONAL AI (S2-24-AIMLCZG521) ASSIGNMENT
- INDIVIDUAL REPORT

1. Preliminary Content

- BITS Student ID - 2023AC05540
- NAME - LAKSHMISRINIVAS PERAKAM
- GROUP NO - 43
- TITLE OF RESEARCH PAPER -

CONVERSATIONAL GROUNDING: ANNOTATION AND
ANALYSIS OF GROUNDING ACTS AND GROUNDING
UNITS.

AUTHORS:
BISWESH MOHAPATRA, SEEMAB HASAN, LAURENT
ROMARY, JUSTINE CASSEL

PUBLISHED:
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SOURCE:
<https://arxiv.org/pdf/2403.16609>.

2. Report - Core analysis of Research Paper.

2.1 Problem addressed & key findings:

- Problem:-

The study investigates the deficiency of conversational grounding in current dialog systems particularly those biased on LLMs. It emphasizes the need of systems to establish a mutual understanding, known as "common ground", to facilitate effective communication.

- Key findings & contributions:

. Annotated two dialogue corpora using a new framework based on grounding acts and grounding units.

- Found a significant lack of grounding in many human-computer interactions. Introduced a baseline model to evaluate how well LLMs can detect grounding behaviours.
- Provides groundwork for better training and evaluation of AI systems for grounded dialogue.

2.2 - methodology and Architecture:

- Annotation Framework:

- Dialogues were annotated using grounding acts like acknowledgement, clarification and repair along with units forming mutual understanding.

- Steps in methodology:

- Dialogue Collection
- Annotation
- Analysis
- Baseline model evaluation.

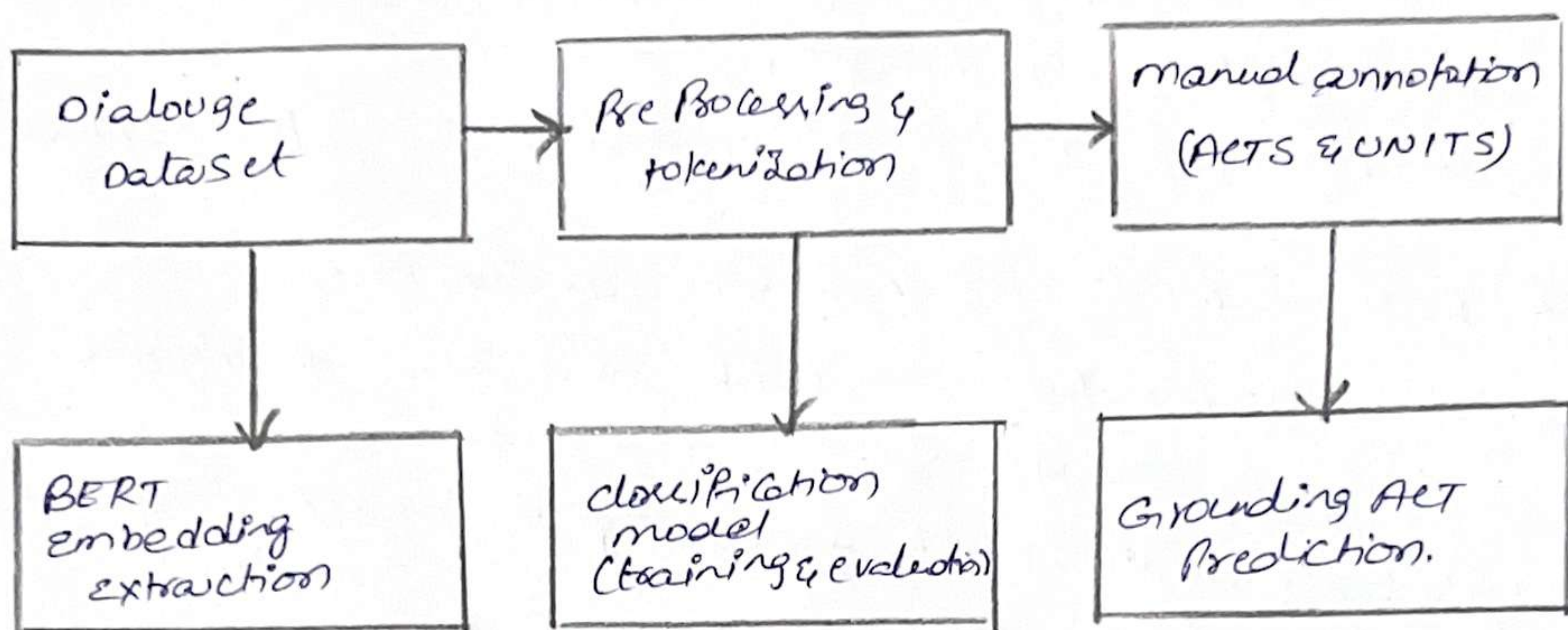
Note: No deep learning architecture was introduced. Focus is on linguistic analysis.

- Dataset Construction:

• The authors curated a set of multimodal dialogues from publicly available sources like 'DailyDialog' and 'switchboard'.

• A set of annotation guidelines was developed and trained linguists manually annotated each utterance for the presence and type of grounding.

2.3 Visual Component



GROUNDING DETECTION AND ANAMOLY PIPELINE

ACTS - Acknowledge, clarify, confirm request
units - segments of shared understanding.

2.4. Critical evaluation:-

(a) Strengths:-

- First paper to propose structured annotation for grounding behaviour
- useful taxonomy for training and evaluation
- Baseline model initiates a LLM learning of grounding behaviour.

(b) Weaknesses:

- No complete dialog system proposed.
- Baseline model is simplistic
- limited real time evaluation

(c) Assumptions:-

- Dialogues used are assumed to be representative
- Annotation interpretation is assumed to be consistent

6) Limitations & Potential biases:-

- Subjective annotation could bias results
- limited diversity in corpora
- complexity of real world grounding not fully captured.

2.5 - Future work and research opportunities:

Future work can take multiple directions to improve grounding-aware AI.

- Integrate multi-modal grounding by incorporating audio-visual cues
- Extend benchmarks to include other languages & cultures.
- Develop dialog policies that adapt grounding strategies based on user profiles or interaction context.
- Investigate the effect of grounding on long-term user engagement and trust in dialogue systems.
- Apply grounding aware models in domains such as education healthcare and assistive robotics
- Explore reinforcement learning approaches to simulate natural human-grounding behaviours

Incorporating grounding into large scale pretrained conversational agents (e.g. GPT type models) could significantly boost their alignment with human communicative norms.

2.6 - Conclusion:

- Grounding plays a foundational role in human dialogue and its lack in current AI systems leads to brittle or awkward instructions. The study through the GRAEF dataset and extensive baseline evaluation, highlights both the difficulties and potential in grounding detection. The findings advocate the shift in the development of conversational agents - treating grounding not as a secondary feature but as a core, objective, moving forward AI systems that can accurately identify & respond to grounding behaviours will enable more engaging interactions across applications.