EMPATHY AND EMOTION ANALYSIS

- HIT-SCIR at WASSA 2023: Empathy and Emotion Analysis
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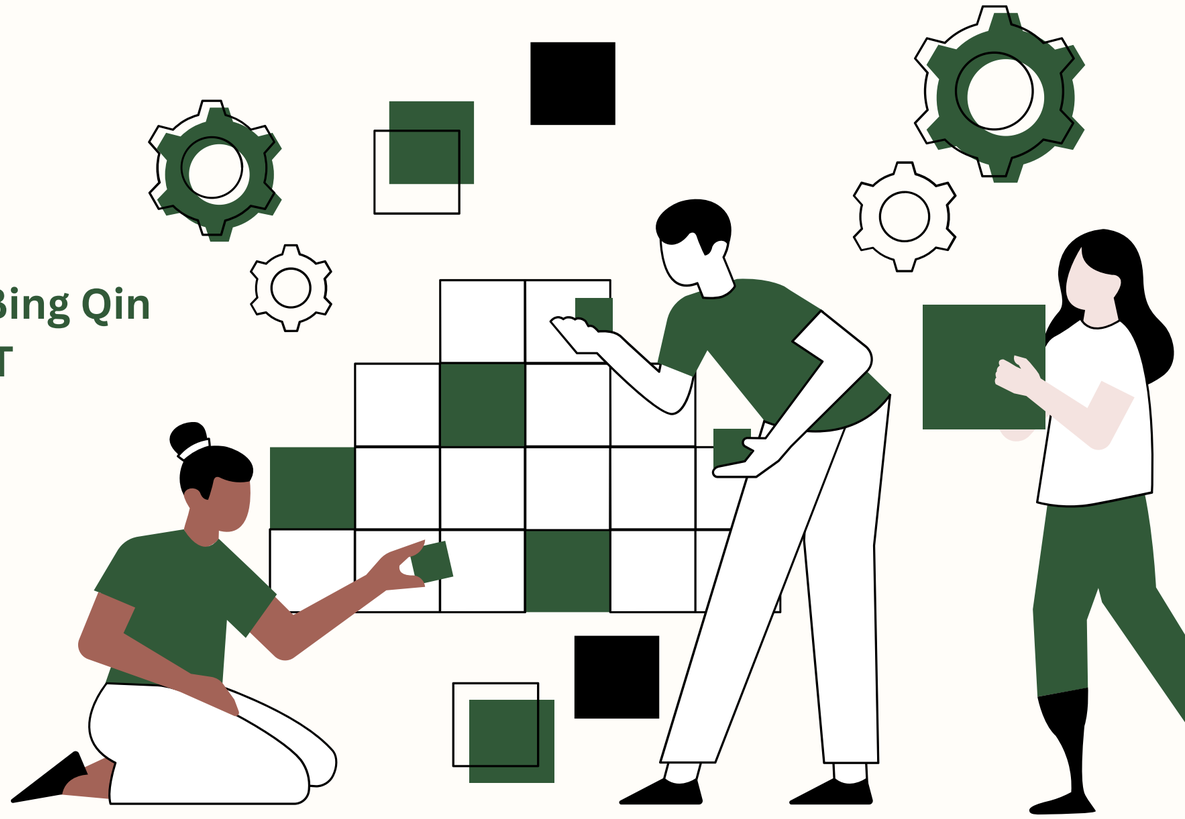
- Venue: WASSA 2023, July 14, 2023



Presented By:

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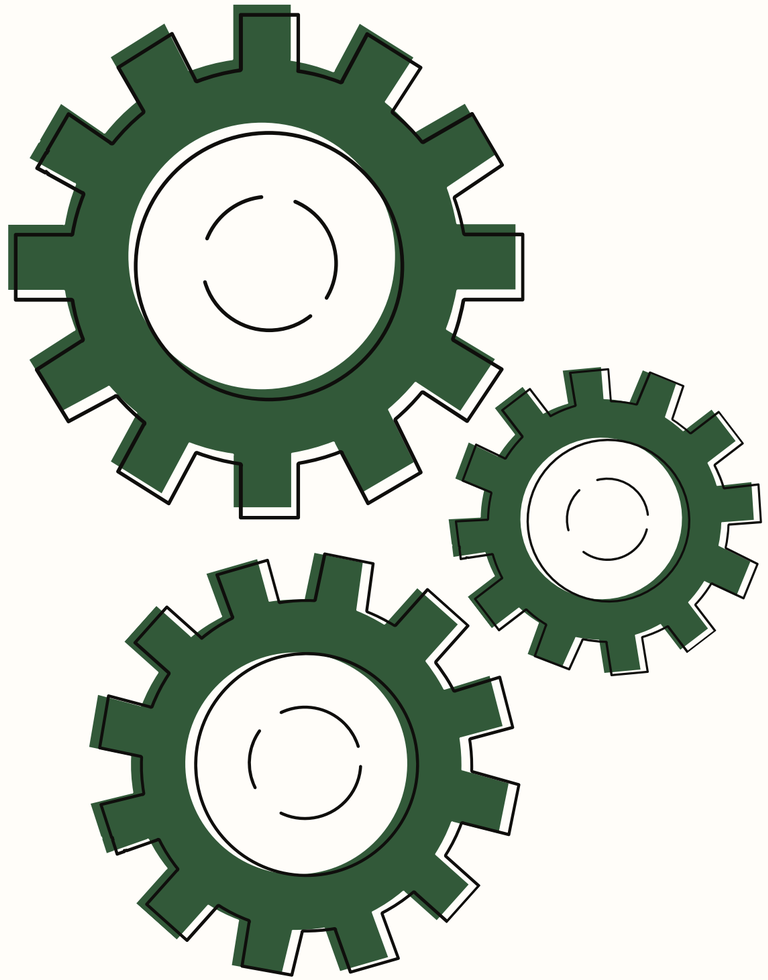
Introduction

- Rise of empathy & emotion analysis in conversational AI
- Importance: improves HCI and user satisfaction
- Paper participates in 3 tracks (CONV, EMP, EMO)



Background & Problem

- Tasks: empathy prediction, emotion detection, distress prediction
- Why it matters: emotional understanding improves AI
- Challenges: context modeling, imbalance, correlation

Literature Review

- Past: BERT, RoBERTa, manual features.
- Limitations: weak context modeling, poor generalization
- Research gap: multi-task learning & augmentation

Research Tracks Overview

Track 1

Utterance-level regression (DeBERTa)

Track 2

Essay-level empathy/distress (RoBERTa MTL)

Track 3

Emotion classification (RoBERTa + BiLSTM + augmentation)

Track 1 Methodology

- DeBERTa-xl/xxl fine-tuning
- Uses context windows for dialogue representation
- Regression outputs for polarity, intensity, empathy

Track 1
Architecture

- Input formatting with context windows
- Encoder → CLS pooling → MLP
- Window size selection based on dev performance

Track 2
Methodology

- Empathy & distress highly correlated (0.63)
- Multi-task learning with shared RoBERTa
- Two MLP heads for separate predictions

Track 2 Architecture

- Shared encoder → task-specific heads
- CLS token representation
- Equal-weighted loss training

Track 3 Methodology

- Small, imbalanced dataset
- ChatGPT-based data augmentation
- RoBERTa-large + BiLSTM classifier

Track 3 Architecture

- RoBERTa encoding → BiLSTM → pooling → MLP
- Sigmoid for multi-label classification

Results Summary

- Track 1: Best performer (Avg Pearson 0.758)
- Track 2: Moderate performance (0.3416)
- Track 3: Macro F1 = 0.644

Evaluation Discussion

- Strengths: strong context modeling, MTL success, augmentation helpful
- Weaknesses: test-set shift, rare-label difficulty
- High computation requirements

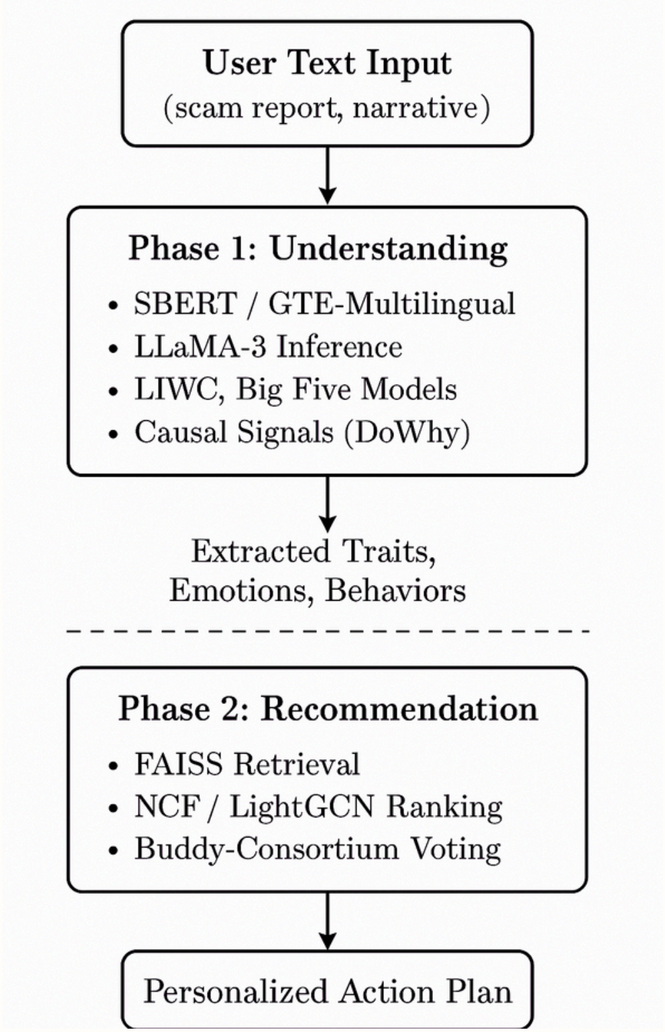
Critical Analysis

- Strengths: systematic design, ensemble filtering
- Weaknesses: large-model dependency
- Impact: improved benchmarks & modeling strategies

Future Work & Conclusion

- Future: domain adaptation, improved augmentation
- Lightweight models for deployment
- Conclusion: effective multi-model, multi-level approach

Model


User Text Input
(scam report, narrative)
Phase 1: Understanding
• SBERT / GTE-Multilingual
• LLaMA-3 Inference
• LIWC, Big Five Models
• Causal Signals (DoWhy)
Extracted Traits,
Emotions, Behaviors
Phase 2: Recommendation
• FAISS Retrieval
• NCF / LightGCN Ranking
• Buddy-Consortium Voting
Personalized Action Plan

References

CORE MODELS & EMBEDDINGS

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9. CAUSALNEX TEAM. (2020). CAUSALNEX: BAYESIAN NETWORKS FOR CAUSAL MODELING.

RECOMMENDATION MODELS

10. HE, X., ET AL. (2017). NEURAL COLLABORATIVE FILTERING (NCF).

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Dataset

A. SCAM / FRAUD NARRATIVE DATASETS

Dataset	Description	Use
IC3 FBI Public Complaint Dataset	Annual text summaries about fraud incidents	Realistic fraud scenarios
ScamWatcher.org Dataset	User-submitted online scam reports	Scenario understanding
Reddit r/scams Dataset (Pushshift)	Large narratives about scam experiences	Emotion & behavior extraction

B. PERSONALITY / PSYCHOLOGICAL DATASETS

Dataset	Use
Essays Dataset (Big Five Personality Texts)	Grounding text → personality trait mapping
myPersonality Facebook Dataset (legacy)	Linguistic markers + Big Five (used in research)
LIWC Dictionaries	Emotional & cognitive linguistic markers

Thank you!