Leveraging Context for Multimodal Fallacy Classification in Political Debates

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Scan for the full paper!

Motivation

- Not all persuasive techniques rely on false facts
- Fallacies rely on misleading reasoning
- Text + audio = **deeper understanding**

Task setup

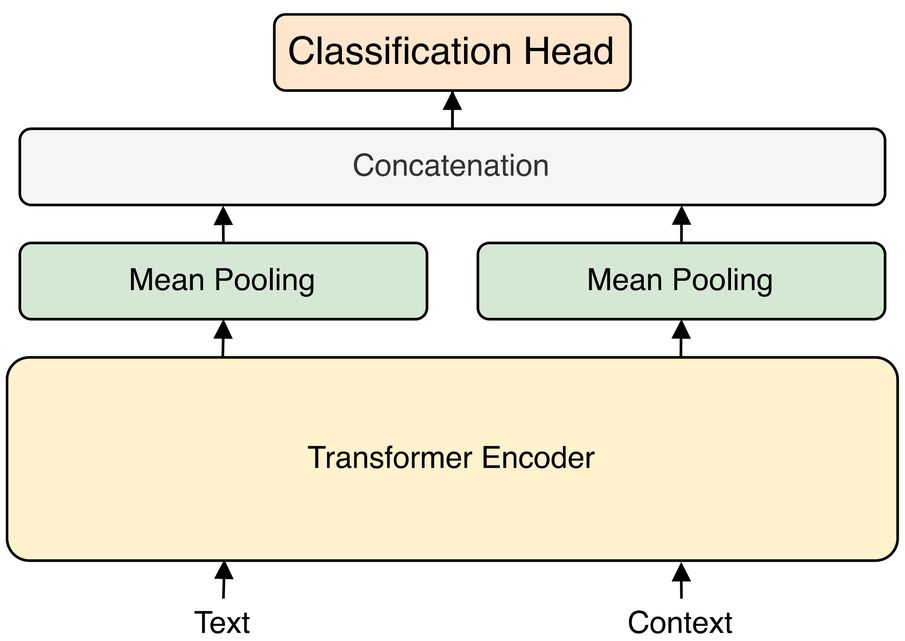
- **Goal**: Classify fallacies in political debates
- **Input types**: Text, Audio, or Multimodal
- **Dataset**: MM-USED-fallacy
- **My focus**: Incorporating **context information**

Text setting

Backbones: RoBERTa-large, ModernBERT, DeBERTaV3
Context strategies

- *Concat*: `[text] [SEP] [context]`
- *ContextPool*: Shared encoder + mean pooling
- *CrossAttn*: Encoder with gated fusion and attentive pooling

Best: ContextPool + RoBERTa-large



ContextPool

Audio setting

Backbones: HuBERT-Base, WavLM, Wav2Vec2
Approaches:

- Fine-tuned HuBERT
- TemporalaAvg (with context, less effective)

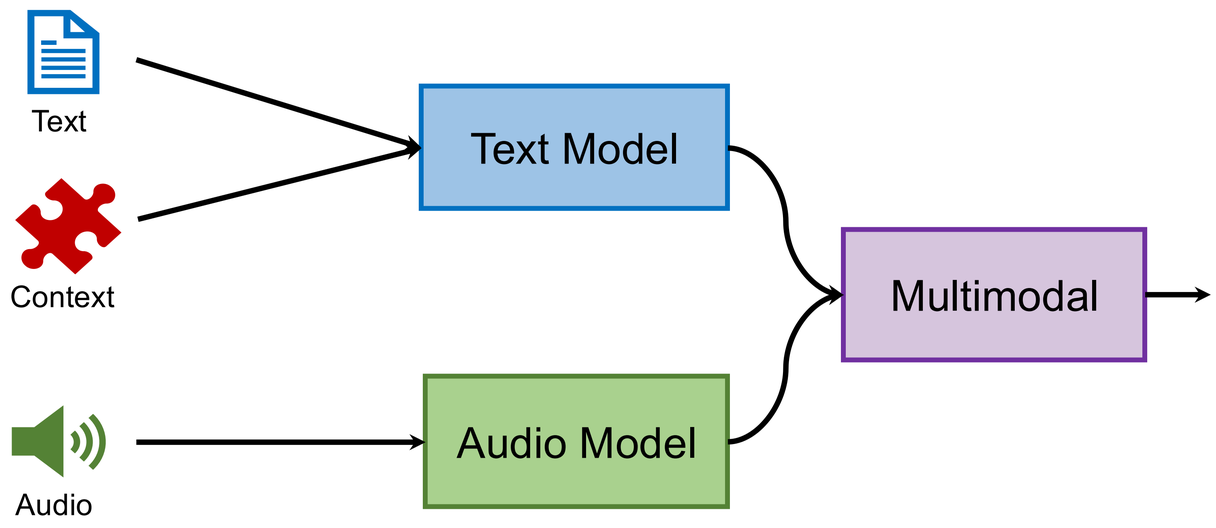
Audio truncated to 15s due to OOM limitations.

Fusion strategy

Late Fusion:

- **Weighted average of logits** via Bayesian optimization
- **Majority Voting** (Text, Audio, Fusion) used in final submission

Result: *"faded" version* of text-only
Hypothesis: Need **better modality interaction** (cross-modal attention, etc.)



Result

Input	Team	F1
Text-Only	Team NUST	0.4856
	Baseline BiLSTM	0.4721
	My team	**0.4444**
Audio-Only	**My team**	**0.3559**
	Team EvaAdriana	0.1858
	Team Nust	0.1588
Text-Audio	Team Nust	0.4611
	My team	**0.4403**
	Baseline RoBERTa + WavLM	0.3816

Key takeaways

1. **Text context** is critical; best results at $N = 5$ window.
2. **Audio-only model (HuBERT)** demonstrates the value of audio for fallacy classification.
3. **Multimodal late fusion** underperforms, needs more **cross-modal learning**.
4. **Dataset challenges**: class imbalance, audio truncation.