DS605- Low resource NLP

Dynamic Demonstration Retrieval and Cognitive Understanding for Emotional Support Conversation

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Problem Overview:

Emotional support conversation (ESC) models struggle with contextual coherence and personalization, often selecting demonstrations independently and ignoring emotional dependencies. Key Challenges:

• Ineffective Demonstration Selection: Models retrieve examples independently, ignoring emotional context.

• Lack of Emotional Dependency Awareness: Selected demonstrations fail to capture nuanced emotional shifts.

• Limited Adaptability in Low-Resource Settings: Insufficient data leads to inconsistent response quality.

Objectives

1. Develop an emotion-aware demonstration ranking framework that optimizes in context learning for ESC.

2. Implement a ranking-based selection mechanism to prioritize emotionally relevant demonstrations.

3. Enhance contextual coherence and personalization in ESC using retrieval augmented generation (RAG).

4. Improve low-resource NLP adaptability by refining demonstration selection for better model performance.

Proposed Solution

➔ **1. Hybrid Retrieval-Augmented Response Generator**

• Leverages retrieval-augmented generation (RAG) for fact-based, emotionally intelligent responses.

• Combines retrieved memory with GPT-based fine-tuned generation for con textual coherence.

➔ **2. Emotion-Aware Demonstration Ranking Module**

• Ranks retrieved demonstrations based on emotional relevance rather than static similarity.

• Uses dependency-aware ranking techniques inspired by DemoRank to optimize ICL.

➔ **3. Memory-Augmented Personalization**

• Stores user-specific emotional contexts to personalize future responses.

• Prevents repetitive or inconsistent emotional support by recalling past interactions.

Thanks