Advanced NLP M25

Project Proposal

Title: Common Sense-Aware Sarcasm and Irony Detection in Text

Project Area(s)

- Interpretability/Explainability

- NLP Applications

- Document Understanding

Problem Statement

Sarcasm and irony frequently appear in online text communication, posing significant challenges for automated understanding due to their context-dependent, and often contradictory nature. Unlike literal expressions, sarcastic and ironic statements often require **common sense reasoning** and **pragmatic interpretation** to detect the intended meaning.

Simple sentiment analysis fails in these cases because surface-level lexical cues are often misleading; positive words may convey negative sentiment when used sarcastically, and vice versa. NLP methods can model the relationships between words, phrases, and context to infer the intended meaning, making them well-suited to address the **non-literal and context-rich** nature of sarcasm and irony.

This project aims to design a flexible sarcasm and irony detection framework that leverages **linguistic features**, **contextual cues**, and optionally **external knowledge sources** (e.g., common sense knowledge bases) to improve understanding of non-literal expressions. The approach will explore methods for

detecting semantic inconsistencies, capturing subtle sentiment reversals, and integrating broader discourse context. The architecture will remain open to multiple NLP paradigms, ranging from traditional machine learning to deep learning and transformer-based methods, allowing room for future extensions such as **multilingual adaptation**, **low-resource fine-tuning**, or **domain-specific customisation**.

Objectives

1. **Develop a robust sarcasm and irony detection framework** that effectively handles figurative language and context-dependent meaning in textual data.

2. **Incorporate contextual and discourse-level features** to improve detection accuracy beyond sentence-level analysis.

3. **Explore integration of external common sense knowledge sources** to capture implicit meaning not directly expressed in text.

4. **Ensure model flexibility** to allow adaptation to different domains (e.g., product reviews, social media) and multiple languages.

5. **Design for scalability and extensibility**, enabling future expansion to multimodal sarcasm and irony detection.