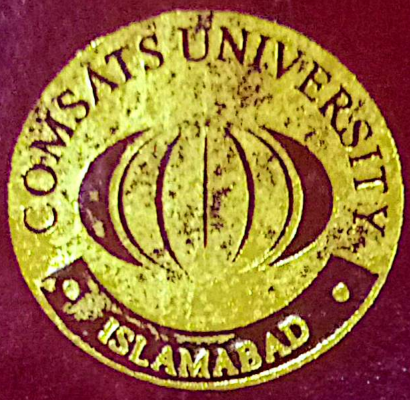
A Comparative Study of DeepSeek R1 (Reasoning) and GPT-4.0 (Non-Reasoning) Agentic AI Models for Irony and Sarcasm Detection between Urdu and English



MS Thesis

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Fall 2025

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A thesis submitted to
COMSATS University Islamabad
In partial fulfilment
of the requirements for the degree of

Master of Science
in
English Linguistics
By

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Abstract

A Comparative Study of DeepSeek R1 (Reasoning) and GPT-4.0 (Non-Reasoning) Agentic AI Models for Irony and Sarcasm Detection Between Urdu and English

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This research paper looks into the problem of Artificial intelligence (AI) models which are struggling two identify irony and sarcasm accurately, because such forms of figurative language do not deliver their literal meaning, as they have meanings that are not in line with their words. Effective execution of such statements needs AI models to have a background of contextual knowledge, culture and ability to read accurate linguistic signals. English is a high-resource language; it has many training data; therefore, AI systems can process language much better than Urdu, which has a small amount of resources. The AI models exhibit disparaging sarcasm and irony recognition across the two languages of English and Urdu since Urdu presents difficulties in the aspects of culture and language. The current analysis of the variations between the non-reasoning ChatGPT 4.0 and the reasoning DeepSeek R1, which is addressed in this study, is lacking.

The present study comparatively analyzes ChatGPT 4.0, which is an agentic AI model that is not reasoning, and DeepSeek R1, which is a reasoning model to assess the efficiency of the two in identifying irony and sarcasm in English and Urdu texts. The study uses the mixed methodology in the form of the quantitative performance assessment and the qualitative error analysis. Two sets of data were used, and 10, 000 samples were used (5, 000 in English and 5, 000 in Urdu). The English dataset includes sarcastic and non-sarcastic twitter and Reddit content, whereas the Urdu dataset is based on Urdu Sarcastic Tweets (UST) and the data gathered with the usage of the