

Master Thesis/ Semester Thesis

Machine Learning based User Intent/Rhetoric Detection in User Messages [Symptom Checker Chatbots]

Background:

Conversational agents in healthcare need to respond not only to user symptoms, but also to how users communicate. User messages may contain signals of **ethos** (credibility/authority), **pathos** (emotion/distress), **logos** (reasoning/information structure), or **neutral** communication. A rule-based rhetoric analysis framework for this purpose already exists and has been applied to earlier chatbot study data. The next step is to investigate whether this framework can be translated into a **machine learning / neural network classifier**.

Objective:

The goal of this thesis is to develop and evaluate an ML-based approach for automatic classification of user messages into **ethos, pathos, logos, and neutral**, using a **hybrid dataset** consisting of:

- user messages from earlier chatbot studies
- doctor–patient / health-related conversation open-source dataset

The thesis should compare the new ML-based approach against the existing rule-based baseline and assess whether hybrid or learned models improve robustness and generalization.

Tasks:

- Review relevant work on rhetorical analysis, text classification, and medical dialogue datasets
- Refine the label schema for **ethos, pathos, logos, neutral**
- Prepare/annotate and harmonize a hybrid training dataset from existing study data and medical dialogue data
- Implement and compare two to three classifiers
- Evaluate performance quantitatively and qualitatively
- Analyze error patterns and implications for adaptive healthcare chatbots

Requirements:

- Interest in NLP / machine learning / conversational AI
- Programming experience in Python (strong proficiency)
- Experience with model training and experiment design
- Experience with text classification or data annotation is advantageous

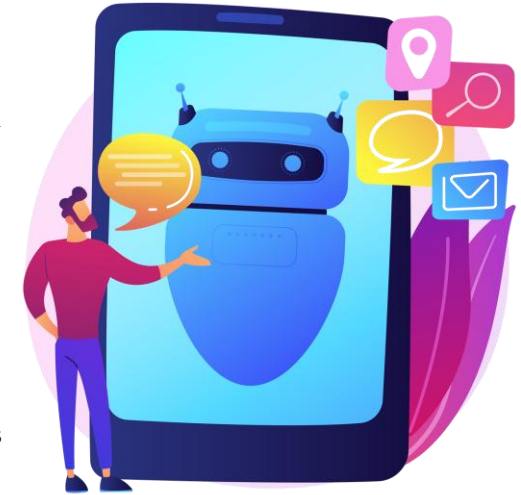


Image designed by Freepik

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