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Deep Learning-Based Virtual Assistant for Sinhala Speakers

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Abstract

Virtual assistance has become increasingly popular and used in various applications in recent years. The evolution of deep learning and natural language processing has introduced new techniques to surpass the limitations of the traditional virtual assistant, making it more productive for human life. While virtual assistants have gained popularity globally, they often fall short of accommodating non-English speakers. This challenge is evident in Sri Lanka, where Sinhala and Tamil languages predominate. In response to this problem, our solution aims to make virtual assistants accessible to those lacking English proficiency by providing a Sinhala-based virtual assistant that incorporates recent advancements in natural language processing and deep learning. The virtual assistant system introduced here operates through a comprehensive architecture involving key components. Data input and preprocessing, involving tasks such as data cleaning and formatting for deep learning model usage. A rule-based intelligent system guides decision-making, incorporating both deep learning and predefined rules to ensure accurate responses to diverse user queries. The General Transformer-based deep learning model addresses general user questions by understanding contextual nuances. Specialised hierarchical deep learning models tailor responses for specific domains like finance or healthcare, building upon the general model's output. The solution integrates a user interface facilitated through a web application and mobile assistant, which enables users to improve their day-to-day activities with the usage of the application.

Keywords: AI, Deep Learning, Machine Learning, NLP, Transformer Model

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