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Doctor, AI, or Hybrid? An Explainable and Risk-Aware Neural Network for Response Classification in Health Consultations

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Abstract: *More patients now utilize online healthcare services through various channels like chatbots, virtual assistants, traditional physicians, or combinations thereof for their consultations. Drawing upon the MedXNet framework ("Is it Doctor or Algorithm? "),. We introduce an innovative medical artificial intelligence system called X-MedXNet, capable of distinguishing between responses originating from doctors, AI systems, and hybrids:*
1. Highlighting influential elements through an attentive approach for better understanding in classifications is explained.
2. An index quantifying the perceived hazard level of a healthcare intervention's potential danger.
This architecture integrates Bidirectional LSTM, Transformer blocks, and 1-D CNNs (similar to those used in MedXNet), along with supplementary components focused on explainability and risk assessment. Our evaluation involves assessing X-MedXNet using data derived from the MEDIC dialogue corpus found in arXiv along with additional human-annotated (mixed-methods) and potentially hazardous clinical statements gathered specifically for this purpose. Through trials, X-MedXNet exhibits superior classification precision for origins compared to MedXNet, while also showing robust alignment of its predictive metrics against medical professionals' judgments. This module provides understandable visual representations of where neural networks focus their processing, which corresponds closely to how humans reason about tasks. This project aims to improve accessibility, credibility, and security within healthcare consultations facilitated by artificial intelligence tools.

Keywords: Neural Network, MedXNet, Explainable AI, Risk Scoring, Response Classification, Health Consultation, BiLSTM, Transformer, CNN

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