A Unified Framework for Predicting Drugs, Infections, and Side Effects Using Deep Learning

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Abstract:

Understanding disease inquiry has an indispensable role in public health, enabling individuals to catch on to basic health knowledge. As diseases evolve rapidly and new treatments emerge, communication to both drug criteria and medical conditions is becoming critical. This research presents, for development of an AI-driven system aimed at intensifying disease perception. To strong and reliable data, a custom dataset was curated by assimilating three trusted sources: The National Institute of Health (NIH) pill box retired, The Food and Drug Administration (FDA), and Druglib. For disease exploration, four deep learning models were accomplished: Multi-task Dense Neural Network, Multi-task Feed forward neural network, Multi-task Gated Recurrent Unit, and Multi-task Hierarchical Attention Network. These models were trained to anticipate the drug name, type of infection, and side effects in conformity with disease input. Among them, the Multi-task Gated Recurrent Unit model achieved the slight maximum performance, with an accuracy of 91.84%. Other, performance metrics such as precision, recall, and confusion matrix were utilized. The overall objective of this research is to develop an artificial intelligence-based unified framework for making healthcare decisions for practitioners based on simplifying knowledge of diseases and drugs, speeding up their diagnosis, and streamlining clinical procedures, thereby ultimately creating better health outcomes.

Keywords:

Multi-task Dense Neural Network, Multi-task Feed Forward Neural Network, Multi-task Gated Recurrent Unit.