

Integrated Machine Learning Framework for At-Home Patients Personalized Risk Prediction Using Activities, Biometric, and Demographic Features

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Abstract : Hospitalizations account for one-third of the total health care spending in the US. Early risk detection and intervention can reduce this high cost and increase the satisfaction of both patients and physicians. Due to the lack of awareness of the potential arising risks in home environment, the opportunities for patients to seek early actions of clinical visits are dramatically reduced. This research aims to offer a highly personalized remote patients monitoring and risk assessment AI framework to identify the potentially preventable hospitalization for both acute as well as chronic diseases. A hybrid-AI framework is trained with data from clinical setting, patients surveys, as well as online databases. 20+ risk factors are analyzed ranging from activities, biometric info, demographic info, socio-economic info, hospitalization history, medication info, lifestyle info, etc. The AI model yields high performance of 87% accuracy and 88 sensitivity with 20+ features. This hybrid-AI framework is proven to be effective in identifying the potentially preventable hospitalization. Further, the high indicative features are identified by the models which guide us to a healthy lifestyle and early intervention suggestions.

Keywords : hospitalization prevention, machine learning, remote patient monitoring, risk prediction

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