MAS12

AI-Driven Warfarin Dosing: Harnessing Reinforcement Learning for Optimal Patient Outcomes

Rishi Simhadri[1], Shantanu Awasthi[2]
[1]Basis Ahwatukee, Phoenix, AZ, USA. [2]Missouri Southern State University, Joplin, MO, USA

Abstract

Determining the optimal warfarin dose is complex due to multiple influencing factors, with incorrect dosing leading to serious health risks. This research applies Reinforcement Learning (RL) using the LinUCB algorithm to optimize warfarin dosage across three experiments. We tested various reward structures, identifying accuracy-focused dense rewards as the most effective. Hyperopt was utilized for alpha hyperparameter tuning, improving both accuracy and F1 score. Lasso regression was employed for feature selection, identifying key predictors. Using data from PharmGKB, our findings demonstrate RL's potential to enhance personalized warfarin dosing, representing a promising advancement in AI-driven healthcare optimization.

Conference Track

Modeling and Simulation