PrediMed: Predicting Health with a Custom-Built Machine Learning Ensemble

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Although we know how to prevent numerous diseases, existing literature on determining who is at risk of developing a given medical condition continues to use simple logistic regressions rather than more advanced machine-learning methods. I created PrediMed, a novel artificial intelligence system that uses a person's current information to predict his/her chances of becoming affected by diabetes, depression, stroke, high blood pressure, and six other medical issues over the next decade. To implement a novel combination of more powerful algorithms, I coded several artificial intelligence models from the ground up. Each model was tuned with a specialized genetic algorithm before being stacked together into a final custom blend. This ensemble was trained and tested using cross-validation on the data of thousands of people in the National Health and Nutrition Examination Survey, comparing the model's predictions to the actual health of subjects as recorded in a ten-year follow-up study. The PrediMed ensemble significantly outperformed a traditional logistic regression across all ten diseases tested, proving the real-world applicability of machine learning in improving predictive risk assessment of diseases. To demonstrate its accessibility, PrediMed was implemented as a JSP web application, where a user can enter their current health information to obtain crucial foresight into their medical future as well as relevant disease prevention information. With its significantly improved accuracy and comprehensiveness over previous work, this research enables more accurate diagnoses, more effective disease prevention programs, lower healthcare costs, and ultimately a widespread positive impact on public health.

Awards Won:

Second Award of $2,000

REDDS Venture Investment Partners : Award of $5000

GoDaddy: $1,500 Web Innovator Award