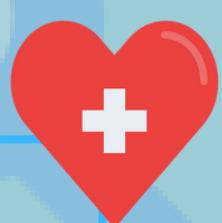# PS02 - AI-Powered Early Risk Prediction for Patient Health Conditions

Team Algoriots

This presents an AI-Based Health Disease Risk Prediction System that uses machine learning to analyze healthcare data and predict disease risk at an early stage. The system processes multiple disease datasets separately, trains individual ML models, and provides risk levels with personalized preventive care recommendations through a user-friendly web interface.

Data Collection

Collected multiple disease datasets from the UCI Machine Learning Repository, including liver disease, diabetes etc

Data Preprocessing & Feature Engineering

Each disease dataset is preprocessed separately, including data cleaning, handling missing values, normalization, encoding, and feature selectionto improve performance.

Disease-Specific Model Training

After data preprocessing, disease-specific machine learning and deep learning models, including XGBoost, and Deep Neural Networks (DNN), are trained and evaluated individually to ensure accurate disease risk prediction.

Model Evaluation & Validation

After training, the disease-specific machine learning and deep learning models are evaluated using performance metrics such as accuracy, precision, recall, F1-score, and ROC–AUC to ensure reliability.

Risk Prediction & Explainability Interface

A user-friendly web-based interface then allows users to input patient symptoms and clinical details. Based on this input, the validated models predict disease risk levels (Low, Medium, or High), provide probability scores, identify key contributing factors

Personalized Preventive Care Insights

Finally, the system delivers personalized preventive care insights, including lifestyle modification recommendations, health monitoring guidance, and early medical consultation alerts to support proactive healthcare management.

Applications

- Early disease risk screening
- Preventive healthcare planning
- Clinical decision support
- Personalized health monitoring

References

- UCI Machine Learning Repository
- WHO Health Reports
- Kaggle Healthcare Datasets
- SHAP – Explainable AI

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AI predicts risk before symptoms become disease