



# Healthy Heart

A HEART DISEASE PREDICTION APP

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Capstone Presentation  
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# Problem Statement

Heart disease is a major public health concern, affecting millions of people worldwide. It is crucial to develop effective solutions for early detection and prevention.



“The greatest  
wealth is health”

—VIRGIL



# THE SOLUTION

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# HEALTHY HEART

- Backed by Machine Learning
- Precision Heart Disease Predictions
- Empowered Patient Recommendations

# ABOUT HEALTHY HEART



## USER FRIENDLY

INTERFACE FOR EASY  
INPUT OF HEALTH  
PARAMETERS



## BACKED BY MACHINE LEARNING

PREDICTIONS BASED ON  
TRAINED RANDOM  
FOREST MODEL



## REAL-TIME

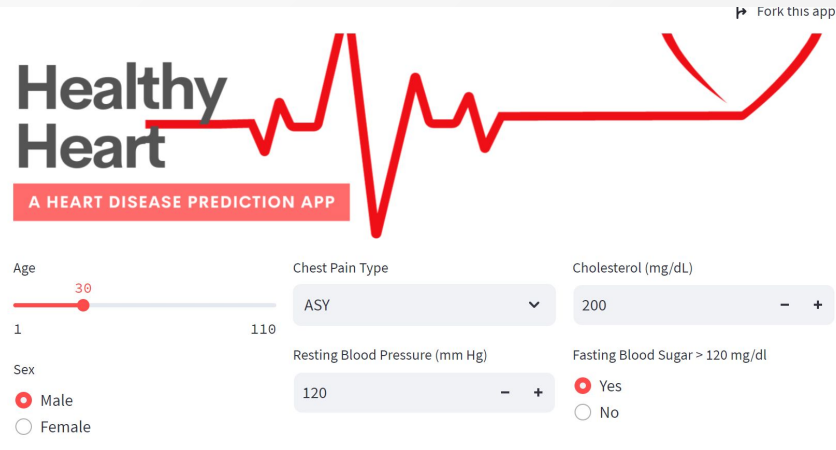
FEEDBACK ON HEART  
DISEASE RISK

# HOW TO USE HEALTHY HEART

## Launch

To view the app go to: <https://healthy-heart.streamlit.app/>

## Input Health Parameters



The screenshot shows the 'Healthy Heart' app interface. At the top, there's a red ECG line graphic. Below it, the title 'Healthy Heart' is displayed in large black font, followed by a red banner that says 'A HEART DISEASE PREDICTION APP'. To the right of the title, there's a link 'Fork this app'. The input section contains several fields: 'Age' is a slider set to 30; 'Chest Pain Type' is a dropdown menu set to 'ASY'; 'Cholesterol (mg/dL)' is a numeric input set to 200; 'Sex' has radio buttons for 'Male' (selected) and 'Female'; 'Resting Blood Pressure (mm Hg)' is a numeric input set to 120; and 'Fasting Blood Sugar > 120 mg/dl' has radio buttons for 'Yes' (selected) and 'No'.

## Click Predict

## Review Results

Predict

The person has no heart disease

# Healthy Heart Development



**Train Models**

**Choose Best Model**



 **Tune Parameters**

**Integrate Model in App**

# Model Summary



**01**

**Final Success Metric**

Recall ~ 89%

**02**

**ALGORITHM**

Random Forest

**03**

**Web App**

Streamlit app  
Healthy Heart





# SNEAK PEEK

Here is a prototype of the webapp

# Future Work



## LAYOUT

Implement additional features like personalized recommendations



## AUDIENCE

Enhance user interface for improved user experience



## DATA

Incorporate more data sources to enhance background model performance



## TESTING

Train models on larger datasets, refine app structure based on feedback and success metrics.



# OUR RECOMMENDATIONS



## MODEL

Use the machine learning model that performs the best:  
Random Forest

## FEATURE

Create modular web app with main page, personalized recommendations

## FEEDBACK

Create a feedback mechanism to address user needs

## DATA

Train models with larger datasets

## GPU

Optimize background model to leverage GPU available through Colab

## TEST

Test the app performance against ground truth generated by expert created larger datasets.



# THANKS!

Do you have any questions?

You can find out more at:

Repo:

[https://github.com/dataeducator/healthy\\_heart](https://github.com/dataeducator/healthy_heart)

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# Additional Credits

- [1] Detrano, R., Jánosi, A., Steinbrunn, W., Pfisterer, M., Schmid, J., Sandhu, S., Guppy, K., Lee, S., & Froelicher, V. (1989). International application of a new probability algorithm for the diagnosis of coronary artery disease. American Journal of Cardiology.
- [2] Jánosi, A., Steinbrunn, W., Pfisterer, M., & Detrano, R. (1988). Heart Disease. UCI Machine Learning Repository. <https://doi.org/10.24432/C52P4X>.
- [3] Fedesoriano. (September 2021). Heart Failure Prediction Dataset. Retrieved September 17, 2023, from <https://www.kaggle.com/fedesoriano/heart-failure-prediction>.
- [4] Rajpurkar, P., et al. (2017). Deep learning for chest radiograph diagnosis: A retrospective comparison of the CheXNeXt algorithm to practicing radiologists. PLOS Medicine, 15(11), e1002686. <https://doi.org/10.1371/journal.pmed.1002686>.