GE Healthcare

Early Prediction of Sepsis

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Team Pymetrics

Disclaimer: This project is developed as a part of Smart India Hackathon 2020 conducted at IIIT Nagpur.

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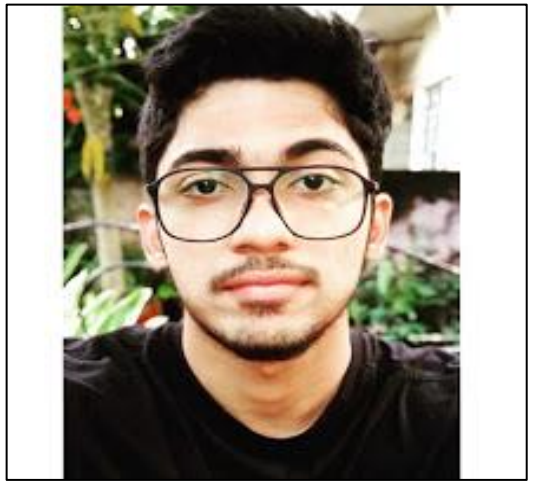

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Introduction

Sepsis is a potentially life-threatening condition caused by the body's response to an infection.

The goal of our team is-

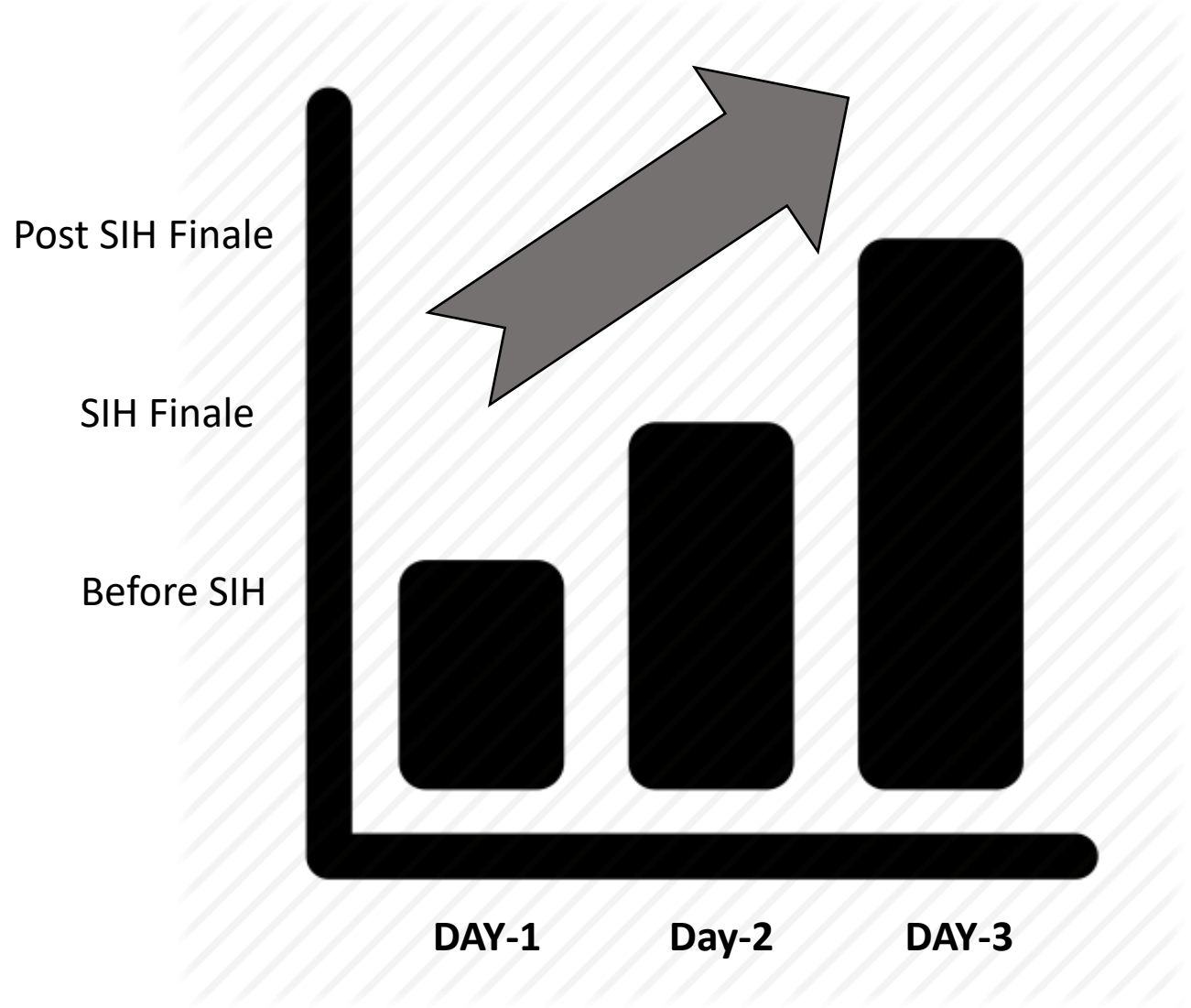
- Early detection of sepsis using physiological data
- Create awareness about this syndrome in our society

Product Development

Features Introduced

Feature Name	Description
ShockIndex	Ratio of heart rate to systolic blood pressure (HR/SBP)
BUN/CR	Bilirubin / creatinine ratio
qSOFA	Partial recreation of the SOFA score
SOFA Deterioration	Binary marker of deterioration
SOFA	Min value each vital sign takes over some look-back window
ShockIndexMin	Max value each vital sign takes over some look-back window
ShockIndexMax	The number of measurements taken of each lab value over some lookback window
MAPMax	
MAPMin	

Performance Journey



Solution Progress

Features	Our solution Model	Physionet 2019 Winner's Model	Advantages
Data Imputation Method	MICE + Mean Imputation	XG Boost + Predictive Mean Matching	Deduce values much closer to real values
Data Imputation Accuracy	88.23 %	83.77 %	Better training accuracy
Training Classifier	Bi-LSTM + Regression	XGB + Regression	Overcome overfitting issue
Training Time	4.5 hours with GPU Support (Google Colab)	20 hours	More features can be included in lesser time
Model Validation	GE Healthcare	Physionet	-
Accuracy	94%(Day-2)	87%	Better Prediction

Unique Selling Points

Quality of Clinical Research

Monitoring, Tracking and Reliability

Questions ?