MUSTANG METRICS

QUANTIFY YOUR SLEEP HEALTH

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PRIORITIZE SLEEP HEALTH

MUSTANG METRICS

GOALS for Mustang Metrics

The NHT (NightHorse Tracker)

Track & Display User's Heart Rate, Stress Level, Sleep Duration, & More.

User and Provider Benefits of Cloud Data

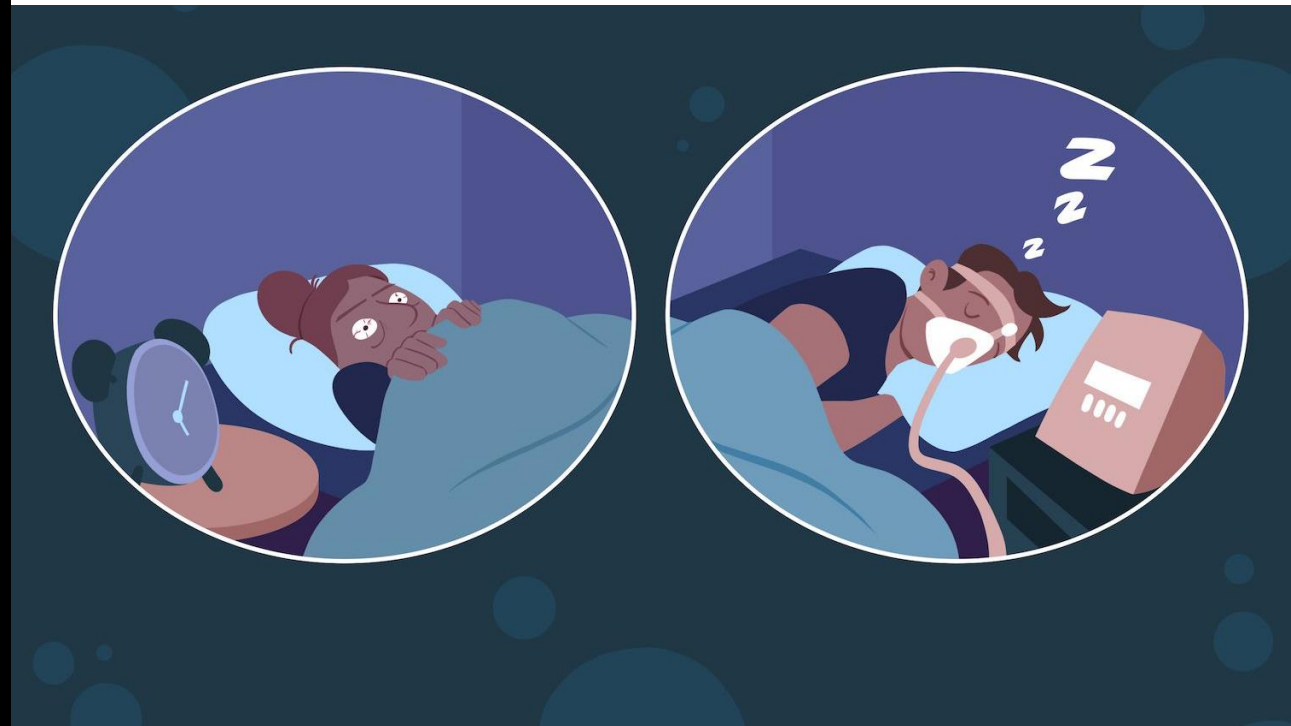
Supervised ML & Cloud to predict Users Sleeping Disorders

Unsupervised ML and Cloud to Raise Users Heart Health Concerns

Personalized Health Plan

PREDICTING PRESENCE OF SLEEP DISORDERS

1. Calorie Intake
2. Quality of Sleep
3. Physical Activity
4. Heart Rate
5. Stress Level
6. Sleep Duration



GRADIENT BOOSTING

- Supervised Learning (labeled data)
- F1 Score, Recall, Precision
- Building Profiles through inputs
- Sample Size: 374

SUPERVISED LEARNING

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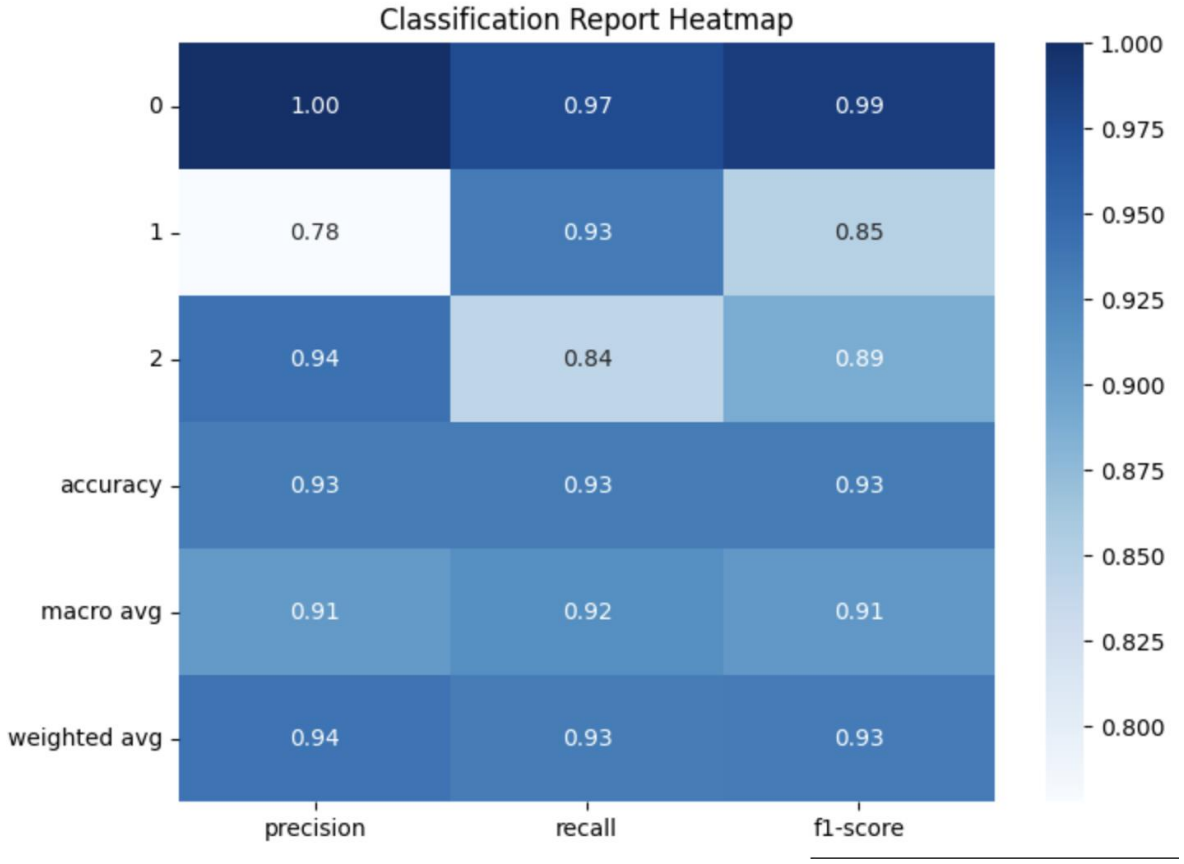

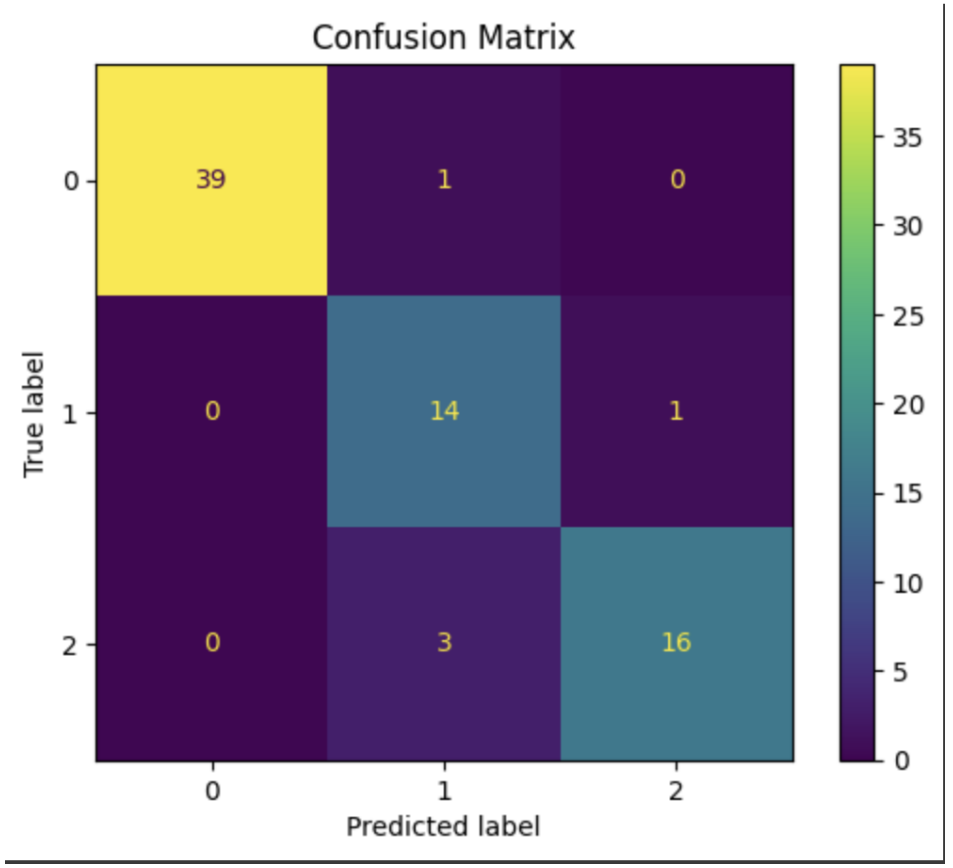

ANOMALY DETECTION FOR AFIB

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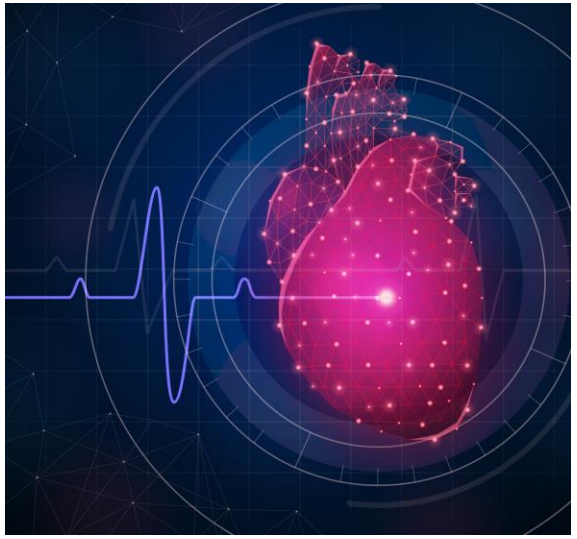


Higher Heart Rate

“inadequate sleep can raise the likelihood of AFib episodes by up to 18% ” – Michigan Medicine

“people may be more prone to experiencing AFib symptoms at night, including heart palpitations, a fast heartbeat.” – Medical News Today

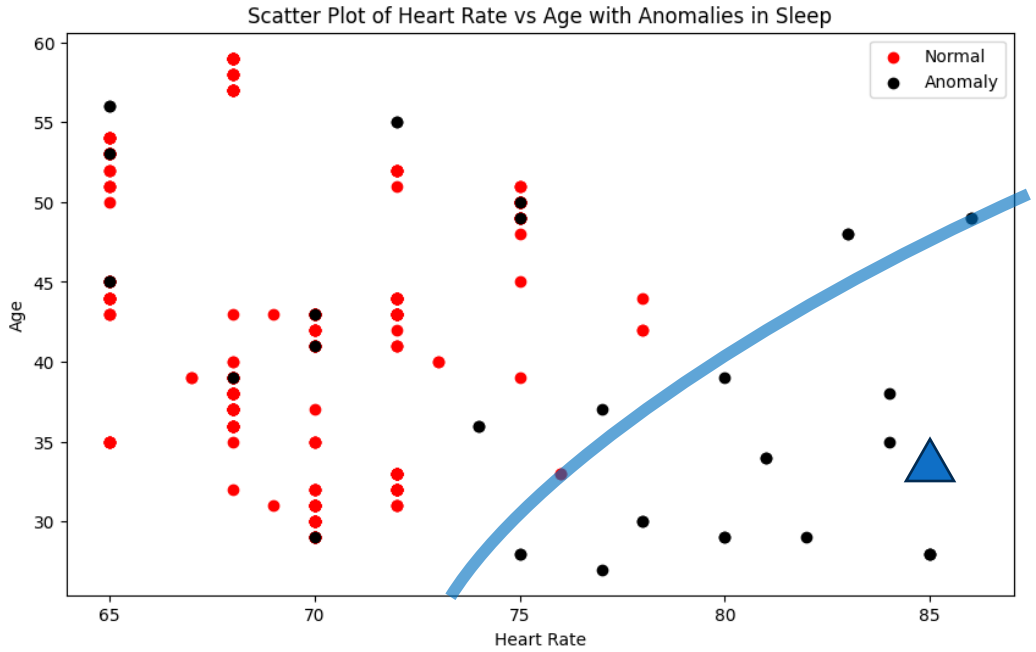
ANOMALY DETECTION WITH ML ALGORITHM

MUSTANG METRICS

Unsupervised Iso Forest Algorithm using Boundary Lines to Separate Normality's from Anomalies

Ex 1: Sarah - 34 Years Old, Sleeping Heart Rate of 85 BPM ▲

NHT tells user that Sarah has a high heart rate for her age which could put her at risk for A-FIB



Makes Sense since Average heartbeat of Adult during Sleep is 40 – 60 BPM in the U.S.

ANOMALY DETECTION WITH ML ALGORITHM

MUSTANG METRICS

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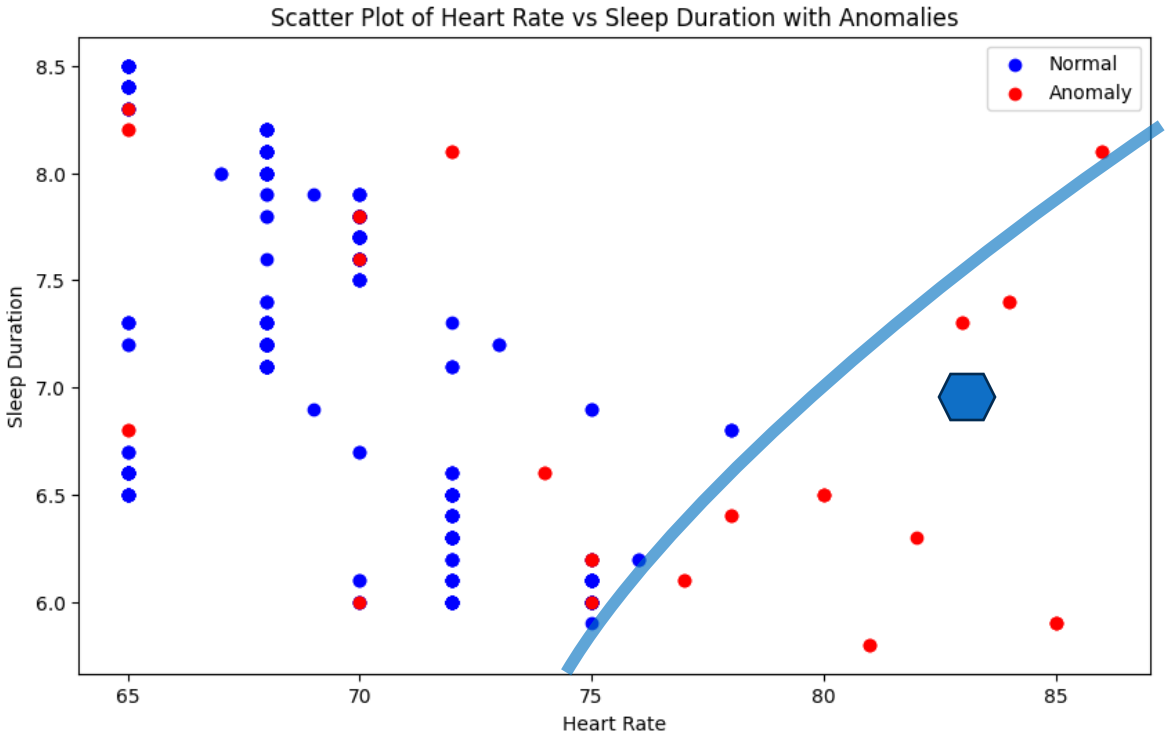
Ex 2: Jose - 7 hours Sleep Duration, 83 BPM

NHT tells user that Sleep is most likely not the underlying cause of A-FIB Symptom



Background: Americans on average sleeps 6.5 hours Daily

MORE ML INTEGRATION WITH NHT

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Unsupervised ML Algorithm Predictor Insights give Mild Warning Notification because of relationship between 2 variables and comparison to general data (Use of Unlabeled Data)

Clustering & Boundary Detection of Users Data signals the instance of Mild Warning on a Weekly basis

Supervised ML Algorithm Predictor Insights give Severe Warning Notification because of Prediction (Use of Labeled Data)

PERSONALIZED HEALTH PLANS

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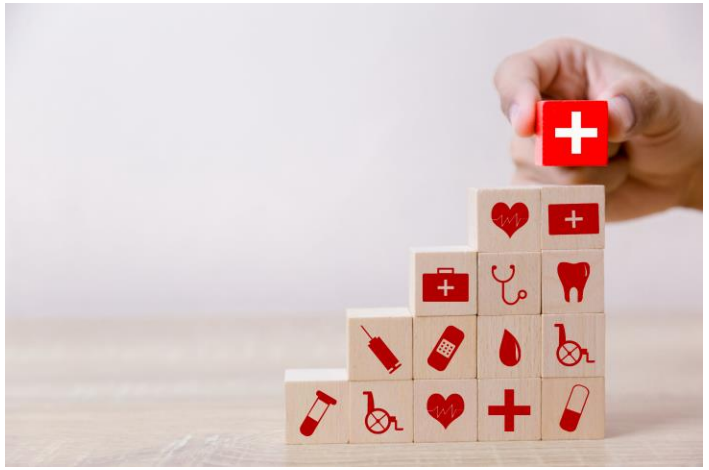

Weekly Health Plans based on Warnings Received

Ex:

Sleep Warnings	Hours of Sleep to Add
No Warnings	0
Only Severe Warning	2
Only Mild Warning	1
Both Mild Warning & Severe Warning	4

CLOSING PITCHES

MUSTANG METRICS

- Keeps you Healthy in the Long Term, Detect it Early
- Cloud & AI integration helps Company, User, & World
- Need Funding for Scaling Larger Data, which would provide more insight

SOURCES & TOOLS

https://www.kaggle.com/code/tanshihjen/eda-sleep-health-and-lifestyle-dataset

https://www.sleepfoundation.org/mental-health/eating-disorders-and-sleep

https://www.sleepcycle.com/sleep-reports/mr-and-mrs-usa-sleep-cycle-2022/

https://www.michiganmedicine.org/health-lab/7-common-afib-triggers-may-surprise-you#:~:text=Even%20small%20interruptions%20in%20an,more%20likely%20to%20develop%20Afib.

https://www.mayoclinic.org/diseases-conditions/atrial-fibrillation/expert-answers/atrial-fibrillation-age-risk/faq-20118478#:~:text=Yes.,more%20common%20in%20older%20adults.

https://www.medicalnewstoday.com/articles/atrial-fibrillation-symptoms-at-night#:~:text=Sleep%20may%20be%20a%20trigger,sweating%2C%20and%20shortness%20of%20breath.

Python, NumPy, Pandas, Sklearn

THANK YOU

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