HUMAN STRESS DETECTION AND PREDECTION USING ANN

SHEGGARI POOJA GOUD

PRESENTER

PROJECT INTRODUCTION

The human stress detection and prediction project uses an artificial neural network (ANN) to monitor and predict stress levels based on physiological data like respiration, sleep, and movement. Developed with python and django, the system offers users a proactive tool for stress management.

OBJECTIVE

It aims to provide a user-friendly tool for proactive stress monitoring and management through a Django-powered web application.

PROJECT OVERVIEW

The web app, built using Django, provides an intuitive interface with features like data visualization and detailed stress insights. This tool bridges the gap between technology and healthcare, making stress monitoring accessible and actionable for everyday users.

The website has dedicated pages for

Signup/ login

Information

User input (health parameters)

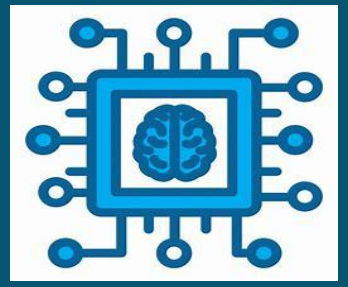
Result (output)

MILESTONES

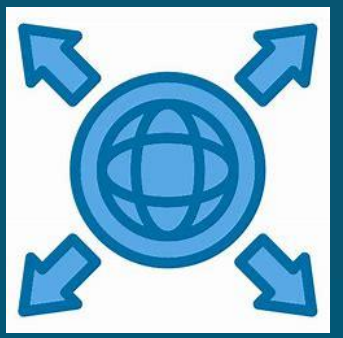
1. Data Preprocessing & Visualizations

2. ANN Model Design

3. Model Training and Visualization



4. Model Deployment



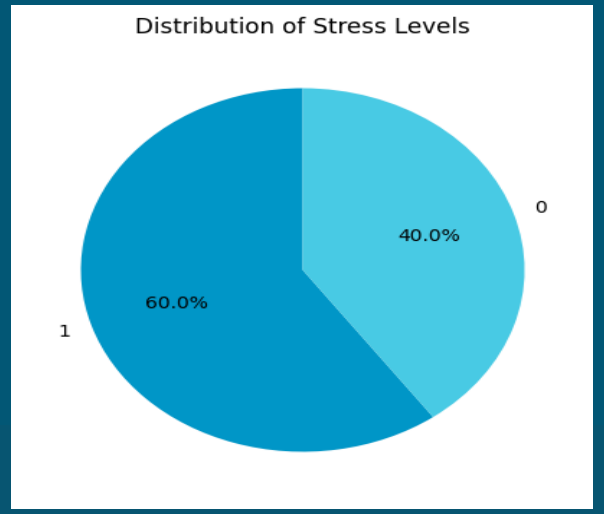
1. DATA CREATION AND VISUALIZATION

•Created a physiological dataset, including heart rate, respiratory rate, and body movements etc.

•Preprocessed and cleaned the dataset by removing noise, normalizing values, and handling missing data for accuracy.

•Used visualization tools like **Matplotlib** and **Seaborn** to explore data relationships and identify significant patterns.

•Created visual aids such as bar charts, correlation matrices, and pair plots to better understand variable interactions.



2. ANN MODEL BUILDING

- Designed a multi-layer **Artificial Neural Network (ANN)** architecture tailored for stress prediction.
- The model includes an input layer to accept multiple health parameters, hidden layers for complex pattern recognition, and an output layer for binary classification.
- The ANN design serves as the core of the system, capable of making accurate stress-level predictions.

```
# Initializing the ANN model
model = Sequential()

# Adding input layer and the first hidden layer (neurons=64, activation='relu')
model.add(Dense(units=64, activation= 'relu', input_shape=(X_train.shape[1],)))

# Adding more hidden layers (neurons=32, activation='relu')
model.add(Dense(units=32, activation= 'relu'))

# Adding the output layer (for multi-class classification, use softmax)
model.add(Dense(units=1, activation= 'sigmoid')) # 2 classes for stress levels (0-1)

# Compile the model
model.compile(optimizer='adam', loss='binary_crossentropy', metrics=['accuracy'])

# View the model Summary
model.summary()
```

3. MODEL TRAINING

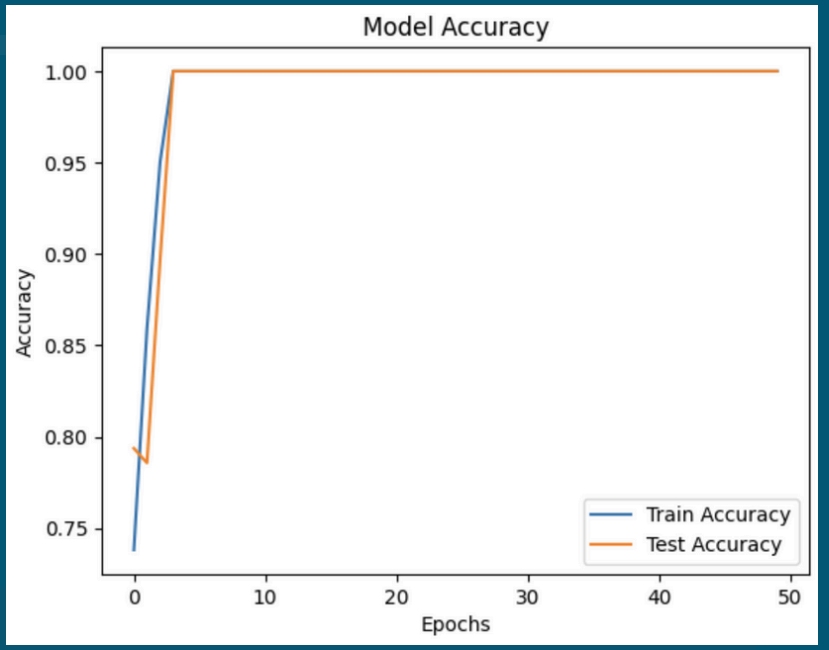
•Trained the ANN using labeled datasets with specific stress and non-stress parameters.

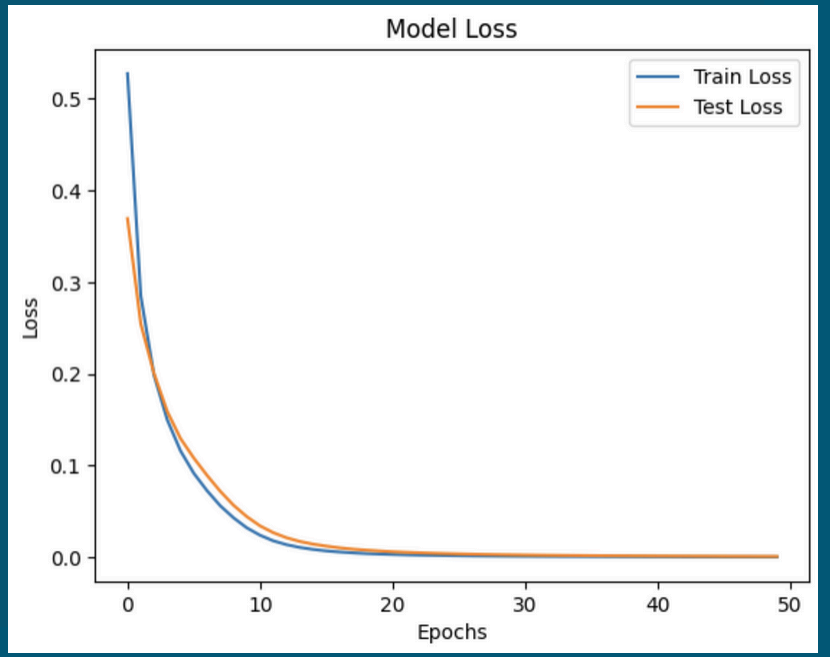
•Monitored metrics like **accuracy** and **loss** during the training phase to track model performance.

•Visualized training progress with graphs, such as loss and accuracy curves, for each epoch to ensure consistency.

•Fine-tuned hyperparameters like learning rate, batch size, and epochs to achieve optimal results.

•The trained model demonstrated high precision and reliability in predicting stress levels effectively.





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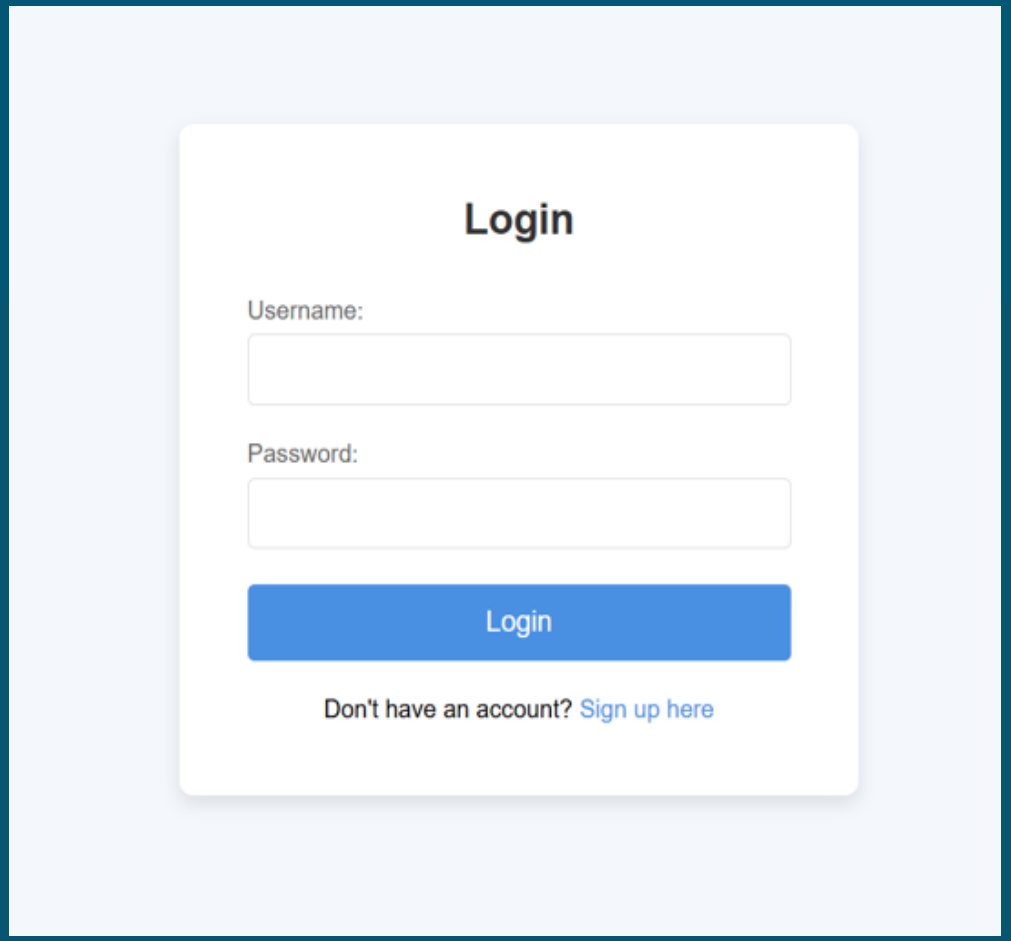
4. MODEL DEPLOYMENT

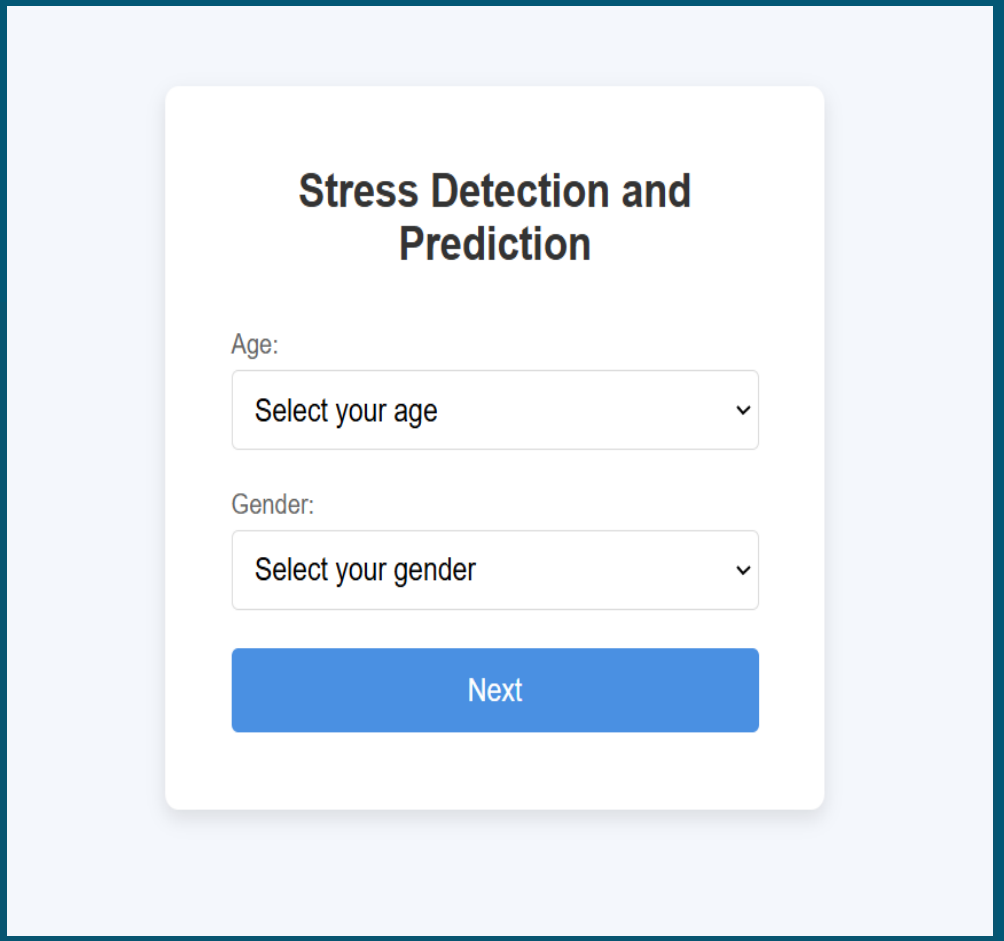
•Integrated the trained ANN model into a **Django-powered web application** for real-time stress predictions.

•Developed APIs for user login/registration, data input, and stress prediction, ensuring seamless interaction

• This deployment makes the stress detection tool accessible, user-friendly, and ready for real-world application.

USER TOUR


Login
Username:
Password:
Login
Don't have an account? Sign up here


Stress Detection and Prediction
Age:
Select your age
Gender:
Select your gender
Next

Stress Detection and Prediction

Snoring Rate:

Enter Snoring Rate

Respiratory Rate:

Enter Respiratory Rate

Body Temperature (°C):

Enter Body Temperature

Limbs Movement:

Enter Limbs Movement Rate

Blood Oxygen Level (%):

Enter Blood Oxygen Level

Eye Movement:

Enter Eye Movement Rate

Sleep Hours:

Enter Hours of Sleep

Heart Rate (bpm):

Enter Heart Rate

Clear All | Result

Stress Detection and Prediction

Patient Age: 35
Patient Gender: Male

Result: Normal

Parameters Provided by the User:

- **Snoring Rate:** 5
- **Respiratory Rate:** 18
- **Body Temperature:** 36.8°C
- **Limbs Movement:** 2
- **Blood Oxygen Level:** 98%
- **Eye Movement:** 3
- **Sleep Hours:** 7.5
- **Heart Rate:** 75 bpm

Get Suggestion

CONCLUSION

The human stress detection and prediction project successfully bridges technology and healthcare by leveraging AI to monitor and predict stress levels. Through data collection, model training, and seamless deployment via django, it provides users with an intuitive tool for proactive stress management. The use of artificial neural networks (anns) ensures accurate predictions based on physiological data. This project highlights the potential of AI in creating personalized healthcare solutions. It serves as a stepping stone for future advancements in stress management and preventive health technologies

THANK YOU