DEPARTMENT OF APEX INSTITUTE OF TECHNOLOGY

PROJECT PROPOSAL

1. Project Title: -

Stress Detection from Sensor Data using Machine Learning Algorithms

2. Project Scope: - (Max 500 words)

Stress is a major factor affecting mental and physical health. The ability to instantly assess stress can improve areas such as healthcare, workplace safety, and personal health. Traditional stress research methods use self-reporting or intervention methods that can be detrimental to continuous monitoring. Based on advanced technology and machine learning, there are many ways to create systems that can detect stress instantly and accurately without intervention. We can Develop machine learning models that can detect stress levels from sensor data. This project aims to achieve the following goals:

Data Collection: Collection of comprehensive information including physical markers known to be associated with stress, such as heart rate, skin conductance muscle, and body temperature.

Extraction: Process raw sensor data to extract important features that are indicative of the mind. Split. Compare these results to the baseline to measure improvement. interest. The sensor will measure physiological signals such as heart rate variability (HRV), electrodermal activity (EDA), and skin temperature. Additional information such as activity level and environment can also be collected to increase the power of the model. Features such as average HRV, EDA peaks, and temperature changes will be extracted.

Time series analysis techniques can be used to detect the development of stressors. These include traditional techniques such as SVMs and random forests, as well as advanced techniques such as convolutional neural networks (CNN) and short-term temporal networks (LSTM) because they can detect complex patterns in the data. Hyperparameter tuning can be done to improve model performance. A cross-validation procedure will be used during training to prevent overfitting. Performance metrics will include accuracy, precision, recall, F1-score, and area under the receiver operating curve (ROC-AUC). The goal is to ensure that the model can perform efficiently with minimal overhead while responding to stress levels in a timely manner. Valid detection of stress levels in the literature. The model can be used throughout the care process and provide potential applications in medical care, workplace safety, and personal health. was diagnosed. Leveraging

physiological data and advanced algorithms, the system will pioneer new ways to monitor and manage stress, ultimately helping to improve mental and physical health.

3. Requirements: -

- ➢ Hardware Requirements
    1. GPU
    2. RAM
    3. CPU
- ➢ Software Requirements
    1. Deep Learning Framework
    2. CNN Model Architecture
    3. Data Preprocessing tools

STUDENTS DETAILS

Name	UID	Signature
Harkirat Singh	21BCS6184	
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APPROVAL AND AUTHORITY TO PROCEED

We approve the project as described above, and authorize the team to proceed.

Name	Title	Signature (With Date)
Dr. Preet Kamal	Project Supervisor	