Titles & Abstract

# 2024- 2025

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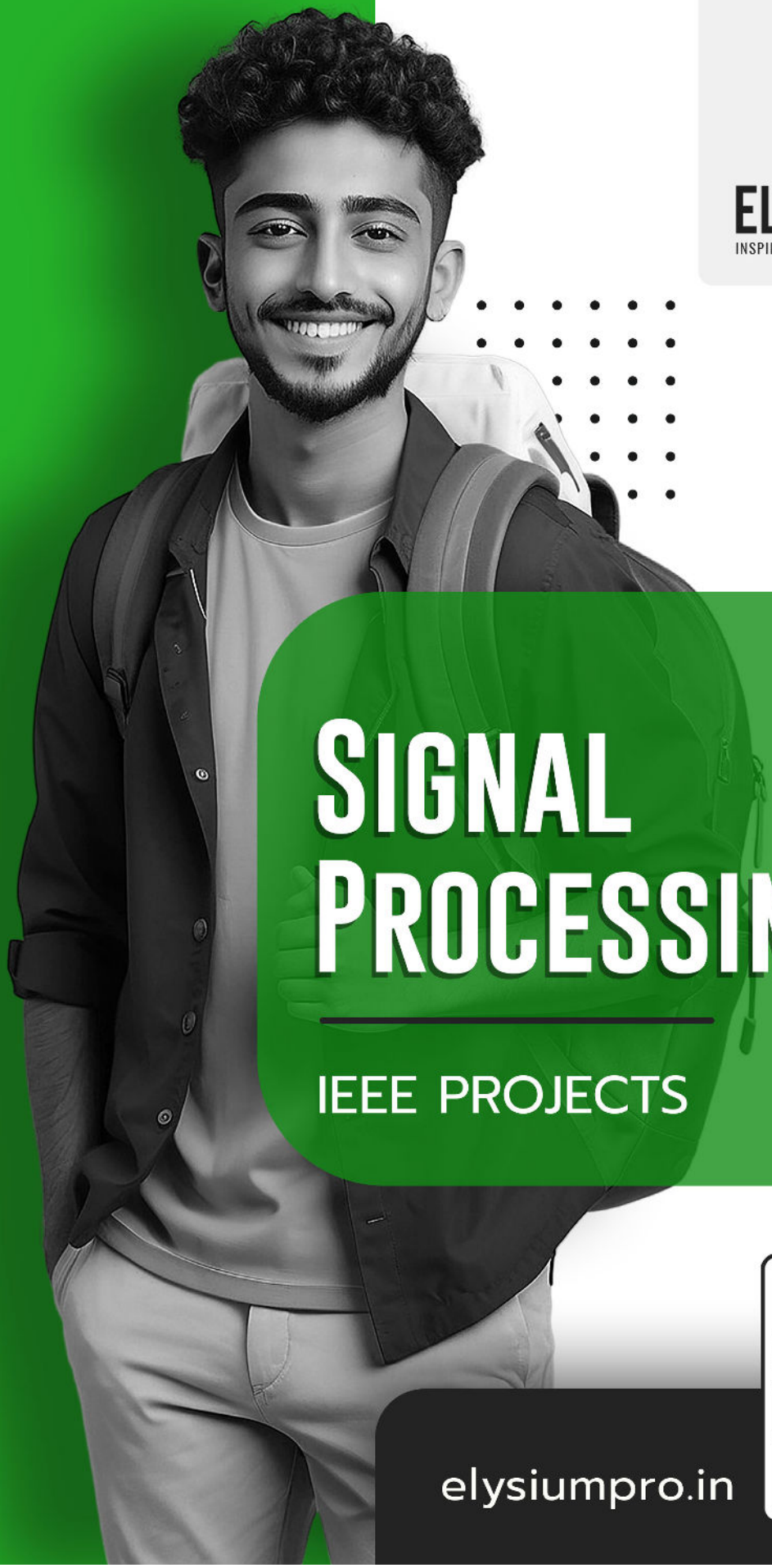

Advanced Academic Final Year Projects

# SIGNAL PROCESSING

## IEEE PROJECTS

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# SIGNAL PROCESSING

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EPRO-SP-001

## Attention-Based CNN Fusion Model for Emotion Recognition During Walking Using Discrete Wavelet Transform on EEG and Inertial

Emotion recognition using EEG signals has gained significant attention in recent years due to its potential applications in various fields such as healthcare, human-computer interaction, and affective computing. However, the accuracy and efficiency of existing EEG-based emotion recognition systems still pose challenges. In this study, we propose an Attention-Based Hybrid Deep Learning Model for EEG Emotion Recognition, which combines the strengths of deep learning and attention mechanisms to improve the accuracy and robustness of emotion recognition from EEG signals. The proposed model demonstrates promising results in recognizing emotions from EEG data, paving the way for enhanced human-machine interaction and emotion-aware systems.

EPRO-SP-002

## Multi-Scale Masked Autoencoders for Cross-Session Emotion Recognition

Emotion recognition from EEG (electroencephalography) signals is a challenging yet promising area of research, with applications ranging from mental health monitoring to adaptive human-computer interactions.

Traditional approaches, such as those using Random Forest algorithms, have shown potential but often fall short in effectively capturing the complex temporal and spatial patterns inherent in EEG data.

In this study, we propose a novel framework employing Multi-Scale Masked Autoencoders (MSMAE) combined with Convolutional Neural Networks (CNNs) for cross-session emotion recognition.

Utilizing the Seed IV EEG dataset, our method leverages the multi-scale feature extraction capabilities of MSMAE to handle varying signal frequencies and the powerful pattern recognition abilities of CNNs to enhance classification accuracy.

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EPRO-SP-003

## Multi-Modal Sleep Stage Classification With Two-Stream Encoder-Decoder

Sleep stage classification is pivotal in understanding sleep disorders and improving overall sleep quality. Traditional approaches to sleep stage classification often rely on single-modal data and conventional machine learning techniques, which may not fully capture the intricate patterns and features across different stages of sleep.

This study proposes a novel multi-modal sleep stage classification framework utilizing Multi-Scale Masked Autoencoders (MSMAE) and Convolutional Neural Networks (CNNs) to enhance the accuracy and robustness of sleep stage predictions.

The system integrates multi-modal data sources, specifically EEG, EOG, and EMG signals, to leverage complementary information and improve classification performance.

EPRO-SP-004

## EEG Signal Processing for Alzheimer's Disorders Using Discrete Wavelet Transform and Machine Learning Approaches

Emotion recognition using EEG signals has gained significant attention in recent years due to its potential applications in various fields such as healthcare, human-computer interaction, and affective computing. However, the accuracy and efficiency of existing EEG-based emotion recognition systems still pose challenges. In this study, we propose an Attention-Based Hybrid Deep Learning Model for EEG Emotion Recognition, which combines the strengths of deep learning and attention mechanisms to improve the accuracy and robustness of emotion recognition from EEG signals. The proposed model demonstrates promising results in recognizing emotions from EEG data, paving the way for enhanced human-machine interaction and emotion-aware systems.

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EPRO-SP-005

## A Machine Learning Based Framework for a Stage-Wise Classificationof Date Palm White Scale Disease

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EPRO-SP-006

## Predicting Emotion From Color Present in Images and Video Excerpts by Machine Learning

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EPRO-SP-007

## A Machine Learning Framework for Early-Stage Detection of Autism Spectrum Disorders

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EPRO-SP-008

## A Novel Approach for Disaster Victim Detection Under Debris Environments Using Decision Tree Algorithms With Deep Learning

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EPRO-SP-009

## On the Robustness of Machine Learning Models for Stress and Anxiety Recognition From Heart Activity Signals

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EPRO-SP-010

## Machine Learning in ADHD and Depression Mental Health Diagnosis: A Survey

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