A Comprehensive Deep Learning-Based Approach for Detecting and Diagnosing Fish Diseases Using Multi spectral imaging Of Advanced Convolutional Neural Network Architectures to Enhance Aquatic Health Monitoring and Management Systems.

Abstract:

Fish disease detection is crucial for maintaining aquaculture health, minimizing economic losses, and ensuring food security. This study explores the application of Convolutional Neural Networks (CNNs), a deep learning technique, to identify fish diseases with high accuracy and efficiency. The objective is to automate disease detection by leveraging image-based analysis, which overcomes the limitations of traditional manual methods prone to human error and time delays. In this research, a dataset comprising images of healthy and diseased fish was pre-processed to enhance feature extraction. The CNN model was designed with multiple convolutional and pooling layers, followed by fully connected layers to classify diseases effectively. Training and testing were conducted on a labeled dataset, achieving a high accuracy rate of over 95%, demonstrating the model's robustness in detecting diseases such as fin rot, ulcers, and white spots. The results indicate that the proposed CNN-based system can serve as a reliable tool for real-time disease monitoring in aquaculture systems. In conclusion, this approach provides a scalable and automated solution to enhance aquaculture disease management, promoting healthier ecosystems and reducing economic losses for fisheries. Future work aims to integrate the model with IoT devices for real-time monitoring and prediction.

Team Members:

21PA1A1292: Penumatsa Oliva

21PA1A12A6: S Venkata Siva Rama Krishna

21PA1A12C4: V Naga Sai Nikhilesh

22PA5A1208: Kotichukkala Vishnu

Signature of Project Guide