**AI-Based Multimodal Fish Health Detector Using Voice and Image Analysis for Sustainable Aquaculture**

**Problem Statement:**

Aquaculture is one of the fastest-growing food production sectors, yet it faces significant challenges due to fish stress and diseases. Early detection of health issues is critical, as delayed diagnosis often leads to large-scale mortality, reduced productivity, and financial losses for farmers. Traditional monitoring methods, such as manual observation of fish behavior or periodic water testing, are slow, labor-intensive, and prone to human error. These approaches frequently fail to identify subtle early signs of stress or infection, resulting in late interventions when damage is already severe. Moreover, resource limitations make advanced medical testing impractical for small and medium-scale farmers. There is a strong need for an intelligent, real-time, and cost-effective system that can automatically detect fish health issues at an early stage. By combining computer vision and audio signal analysis with machine learning, such a system can identify patterns like abnormal swimming, body discoloration, lesions, or stress-related sounds. This will not only reduce fish mortality but also improve aquaculture efficiency and sustainability.