Project Initialization and Planning Phase

Date	19 July 2024
Team ID	SWTID1720110092
Project Title	Beneath the Waves: Unraveling Coral Mysteries Through Deep Learning
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

The proposal report aims to revolutionize coral reef conservation using deep learning algorithms, enhancing understanding and preservation efforts. It addresses the challenges of manual monitoring and assessment, promising more accurate data collection, timely interventions, and informed conservation strategies. Key features include advanced deep learning models for coral health monitoring and biodiversity assessment.

Project Overview	
Objective	The primary objective is to leverage deep learning techniques to advance coral reef conservation efforts, improving monitoring and assessment capabilities for enhanced preservation outcomes.
Scope	The project encompasses the development and implementation of deep learning models tailored for coral health monitoring and biodiversity assessment, aiming to provide researchers and conservationists with robust tools for data-driven decision-making.
Problem Statement	
Description	Current methods for coral reef monitoring and assessment rely heavily on manual processes, which are time-consuming, labor-intensive, and prone to errors. These inefficiencies hinder effective conservation efforts and pose significant challenges to understanding and mitigating threats to coral ecosystems.
Impact	Addressing these challenges with advanced deep learning algorithms will lead to more accurate and efficient monitoring, enabling timely interventions and informed conservation strategies. This will ultimately contribute to the preservation and sustainability of coral reefs worldwide.

Proposed Solution	
Approach	The project proposes the development and deployment of deep learning models capable of analyzing underwater imagery to detect signs of coral bleaching, disease, and other stressors. Additionally, the models will automate the identification and classification of marine species, facilitating comprehensive biodiversity assessments.
Key Features	• Implementation of deep learning-based models for real-time coral health monitoring. • Automation of biodiversity assessment through advanced image recognition and classification techniques. • Integration of data-driven insights to inform conservation policies and strategies.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	2 x NVIDIA V100 GPUs
Memory	RAM specifications	RAM: 8 GB
Storage	Disk space for data, models, and logs	Disk space: 1 TB SSD
Software		
Frameworks	Python frameworks	Python frameworks: Flask
Libraries	Additional libraries	Additional libraries: scikit-learn, pandas, numpy, matplotlib, seaborn
Development Environment	IDE, version control	IDE: Jupyter Notebook, PyCharm
Data		
Data	Source, size, format	Kaggle dataset, UCI dataset