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**Project brief: Mechanical engineering internship with Coral Triangle Center**

**Subject discipline:** Mechanical Engineering; Minor in Conservation Biology

**Organization background**

Coral Triangle Center (CTC) is an independent, non-profit foundation. Its goal is to promote the conservation of marine biodiversity and the sustainable management of marine and coastal resources across the Coral Triangle (CT). Coral reefs in the coral triangle have faced threats from coastal development, destructive/overfishing fishing, tropical storms, and coral bleaching events.

CTC conducts field operations in remote areas of Indonesia and Timor-Leste. It currently conducts coral surveys using the Point Intercept Transect (PIT) method, which is scientifically valid, but relatively out of date and limits the amount of data a diver can collect using SCUBA equipment. CTC is looking to update their survey methods to integrate image-based data collection methods with automated image analysis approaches into their coral reef health monitoring procedures.

**Internship activities:**

Produced a report and literature review for integrating LiDAR data and hyperspectral imagery for coastal and coral reef mapping.

Assessed feasibility of integration of automated image analysis, underwater robots, hyperspectral imaging, and LiDAR technologies into coral monitoring.

Produced designs for an educational mangrove exhibit that to simulate the protection mangroves provide to coastal communities.

Captured structure from motion scans of mangrove trees and pneumatophores to turn them into 3D models and 3D printed objects for the exhibit.

Assisted with developing scripts for the creating automated field reports for CTC.

Participated in a field trip to Nusa Penida where CTC has a Marine Protected Area (MPA) learning site and coral restoration activities.