An AI Submersible Device to Monitor the Restoration of Coral Reefs in John Pennekamp State Park Key Largo, FL

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The project aims to create an AI-based solution that can accurately identify damaged coral reefs using underwater imagery, processing large datasets, identifying damage types, and providing real-time assessments for conservation efforts. The solution must be scalable, cost-effective, and adaptable to different regions and reef conditions. The procedures that were taken are as follows: 1. Build the submersible device 2. Obtain a Raspberry Pi and attach a camera and USB accelerator 3. Create a Python code that trains for three categories of two types of coral- brain and sea fan: bleached, intermediate, and healthy. 4. Attach Raspberry Pi to my submersible device 5. I trained the Raspberry Pi code with 15 pictures of each category. NOAA supplied the images with permission from Florida International University's Department of Marine Chemistry. 6. Test and retest the program with the camera 7. Record % accuracy of data. To collect data I used 15 images of stony and soft coral, and then created a Python code that trained three categories of coral types: bleached, intermediate, and healthy, using 90 pictures. I was able to complete my engineering goals by first developing a cost-effective AI submersible device that accurately identifies the health status of brain and sea fan corals. The Python program, that I then created, accurately processes large datasets, identifying damage types and providing real-time assessments to marine researchers. The device is crucial for restoration projects at John Pennekamp Coral Reef State Park, which plays a vital role in preserving and recovering Florida's coral reef ecosystem.

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