

Background

Ostracods are tiny crustaceans that create luminous courtship displays. WALL-E is a submersible low-light camera that can be deployed to analyze these patterns using computer vision techniques.

Overview

WALL-E is a two-part project: the hardware setup to effectively capture footage, and the computer vision pipeline (shown below) to extract 3D points from ostracod footage.



Fixing the offset between frames on left and right feed



Transforming the footage to fix fisheye distortion and level out the two feeds

Pulse Matching

Identifying light pulses in the left and right feed that correspond to the same ostracod

3D Mapping

Creating 3D models of ostracod pulses in time



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Key Components





modules

PAM-7Q-0 U-Blox GPS Module GPS to initialize timestamp on videos and gather location data on deployments.

Watec WAT-910HX/RC 570TVL Camera Low-light cameras that capture ostracod footage

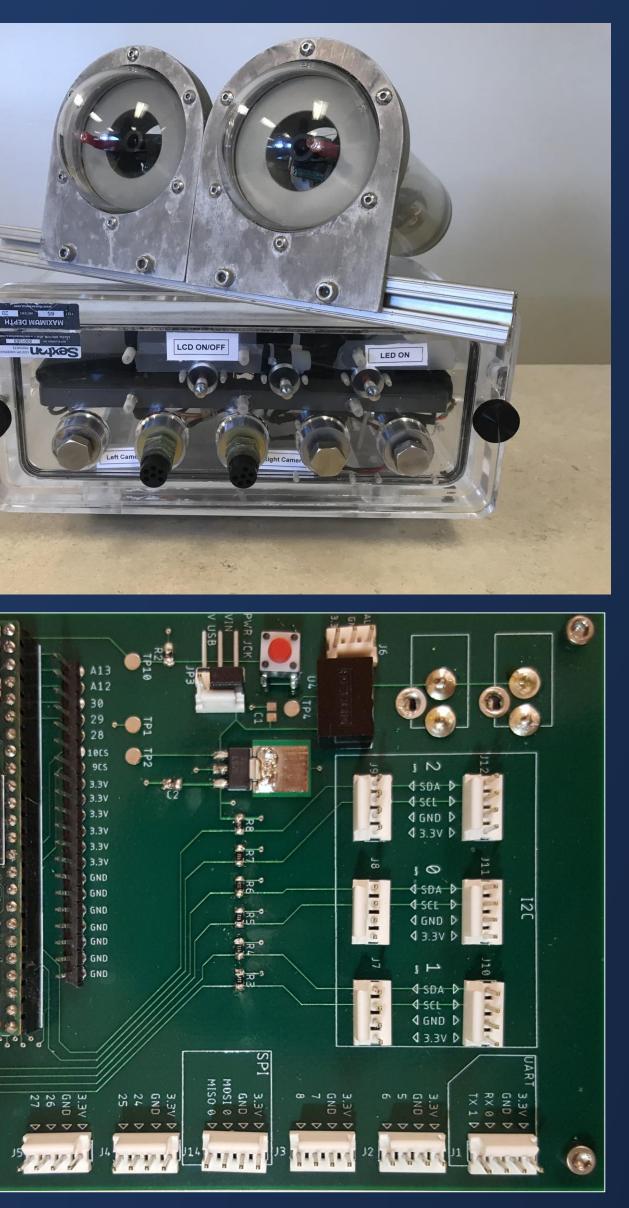
Final Product

Cameras and External Hardware

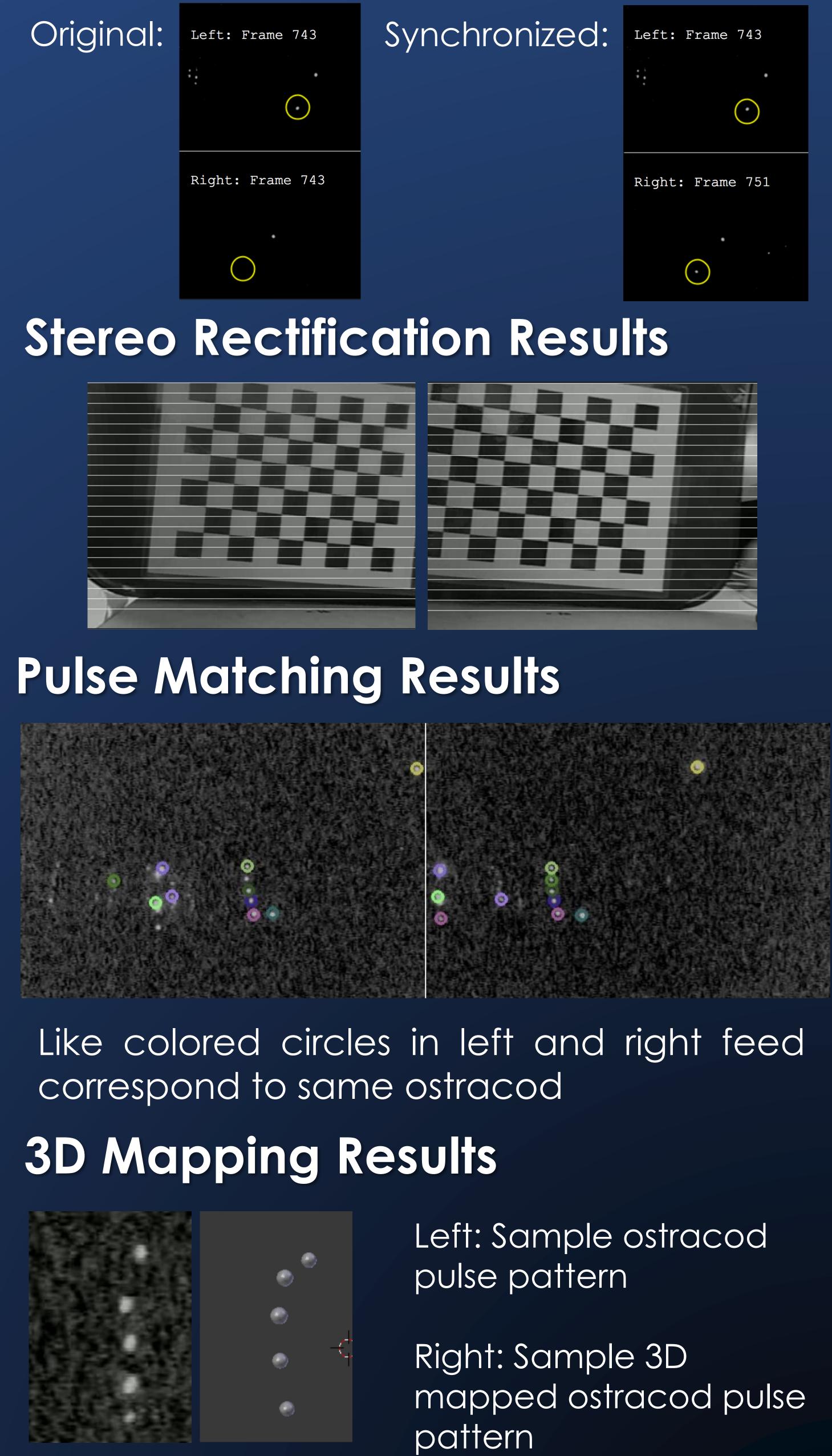
Printed Circuit Board with Soldered Components

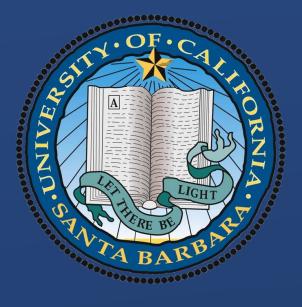
Karthik Kribakaran Wesley Peery

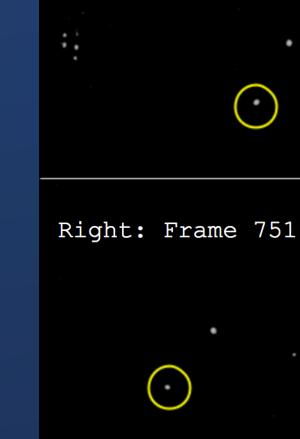
Teensy 3.6 Development Board Microcontroller used to communicate with external



Frame Synchronization Results







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