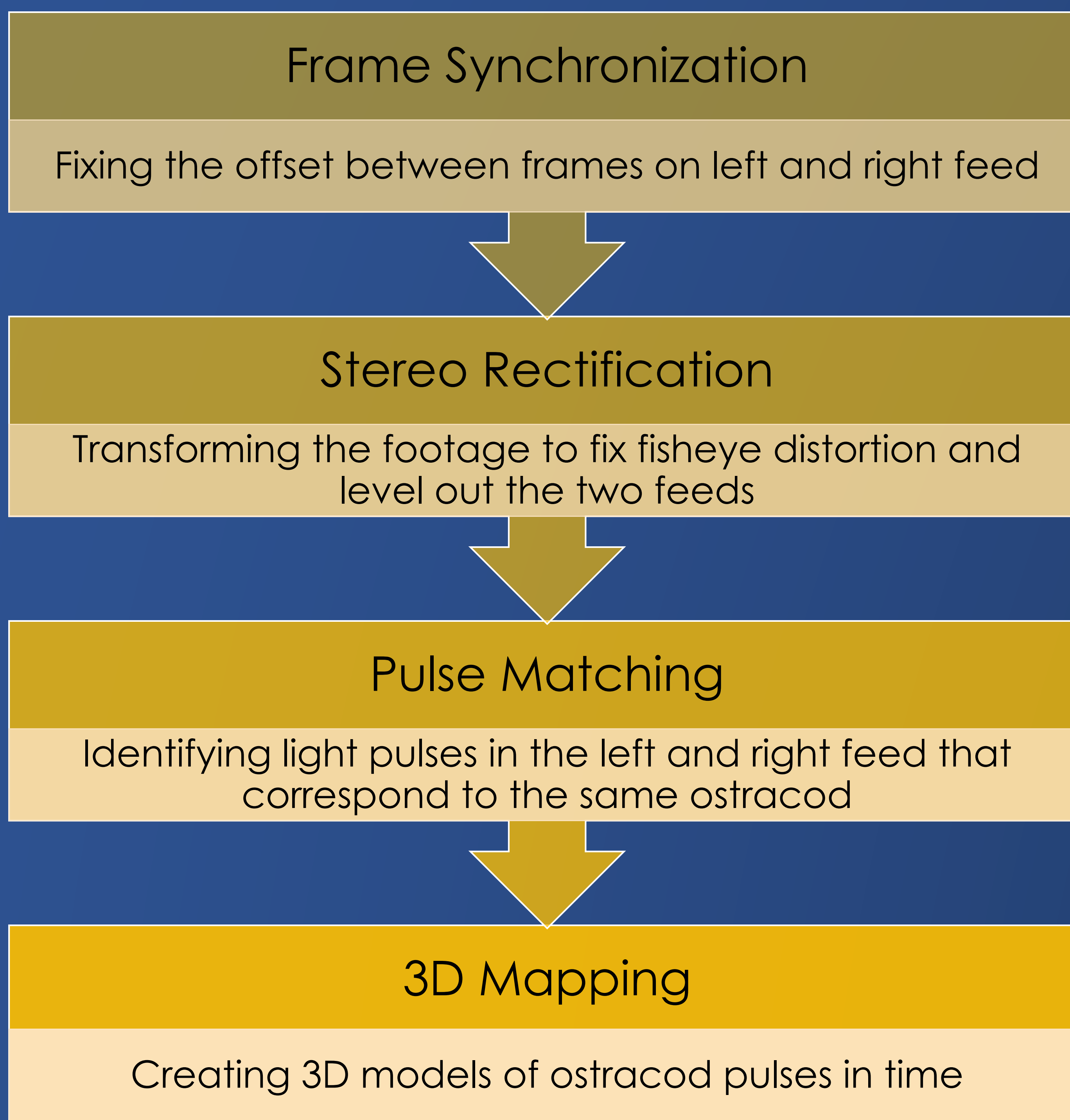


## Background

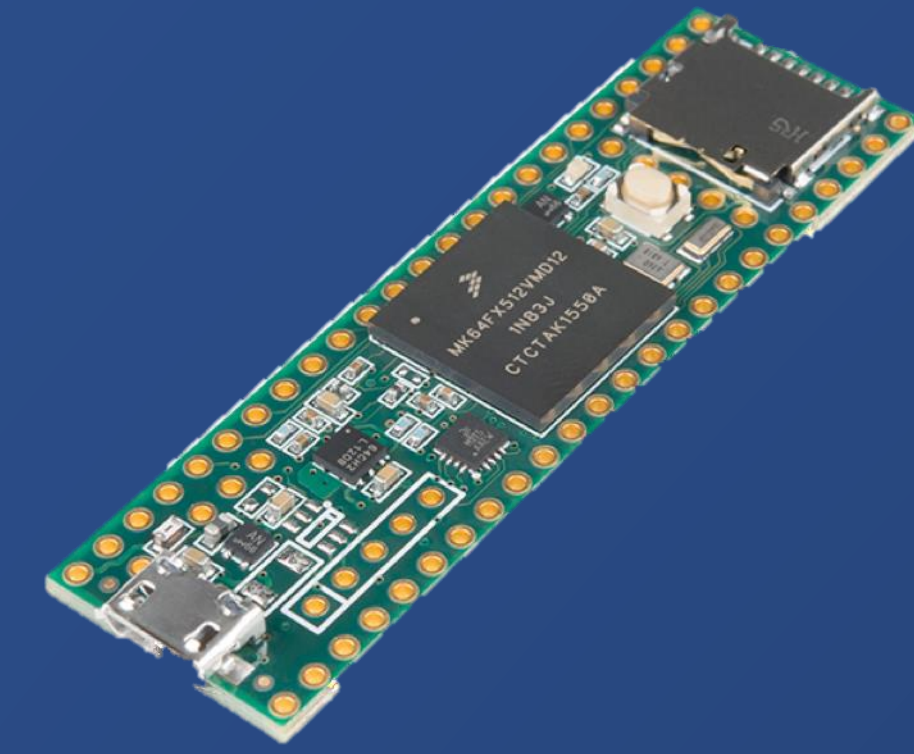
Ostracods are tiny crustaceans that create luminous courtship displays. WALL-E is a submersible low-light camera that can be deployed to analyze these patterns using computer vision techniques.

## Overview

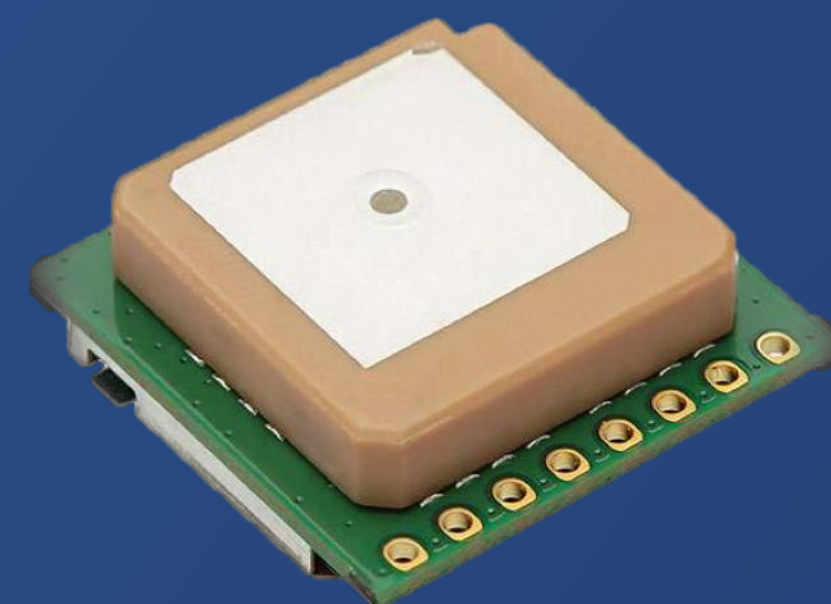
WALL-E is a two-part project: the hardware setup to effectively capture footage, and the computer vision pipeline (shown below) to extract 3D points from ostracod footage.



## Key Components



**Teensy 3.6 Development Board**  
Microcontroller used to communicate with external modules



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



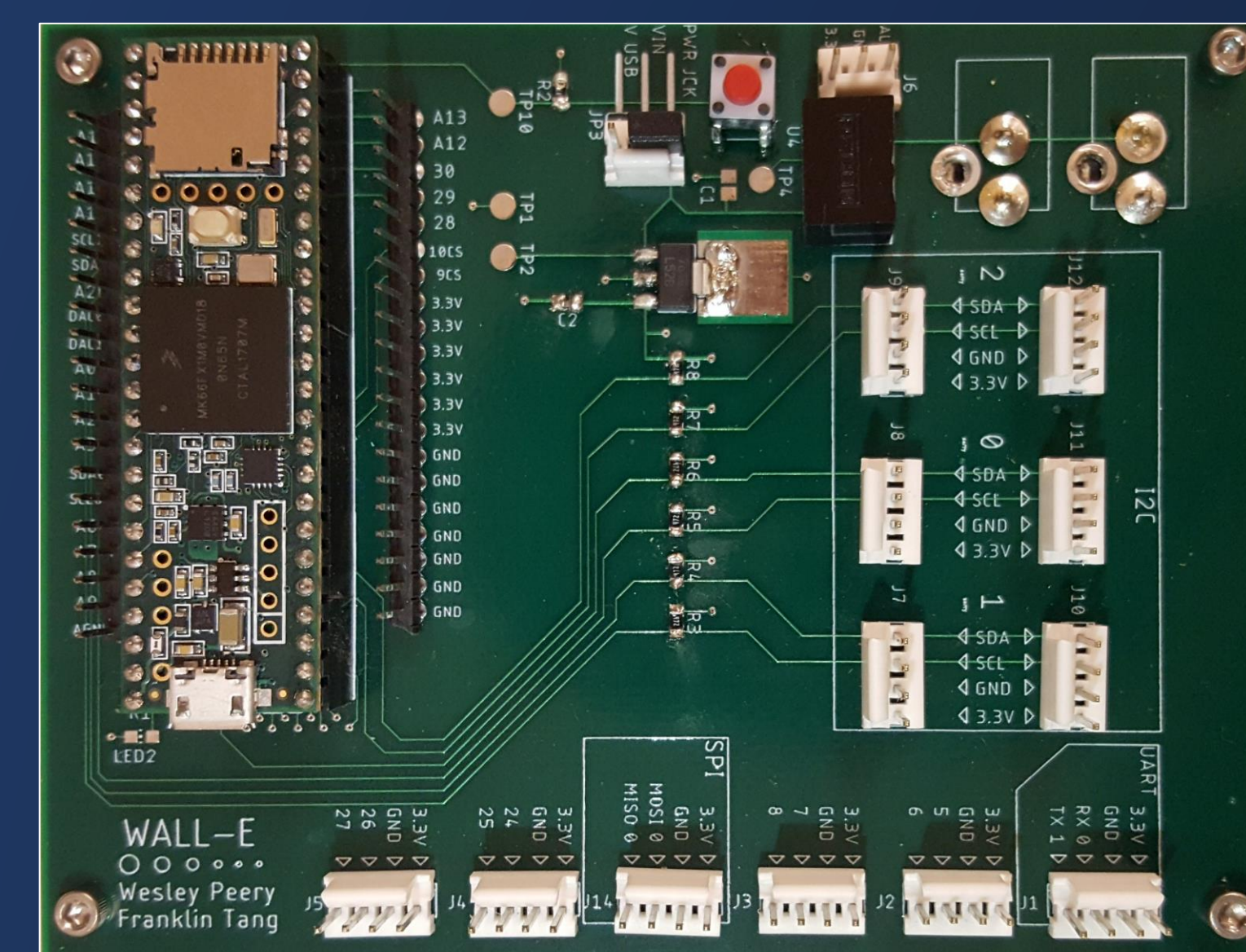
**Watec WAT-910HX/RC 570TVL Camera**  
Low-light cameras that capture ostracod footage

## Final Product

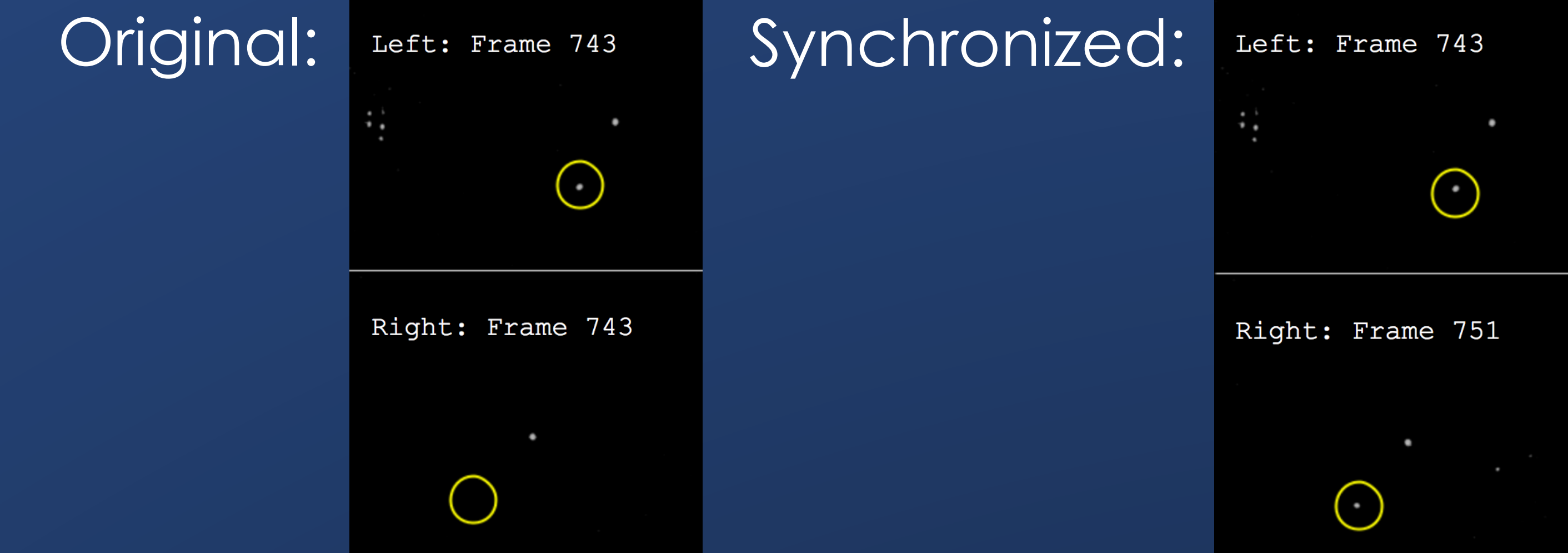
Cameras and External Hardware



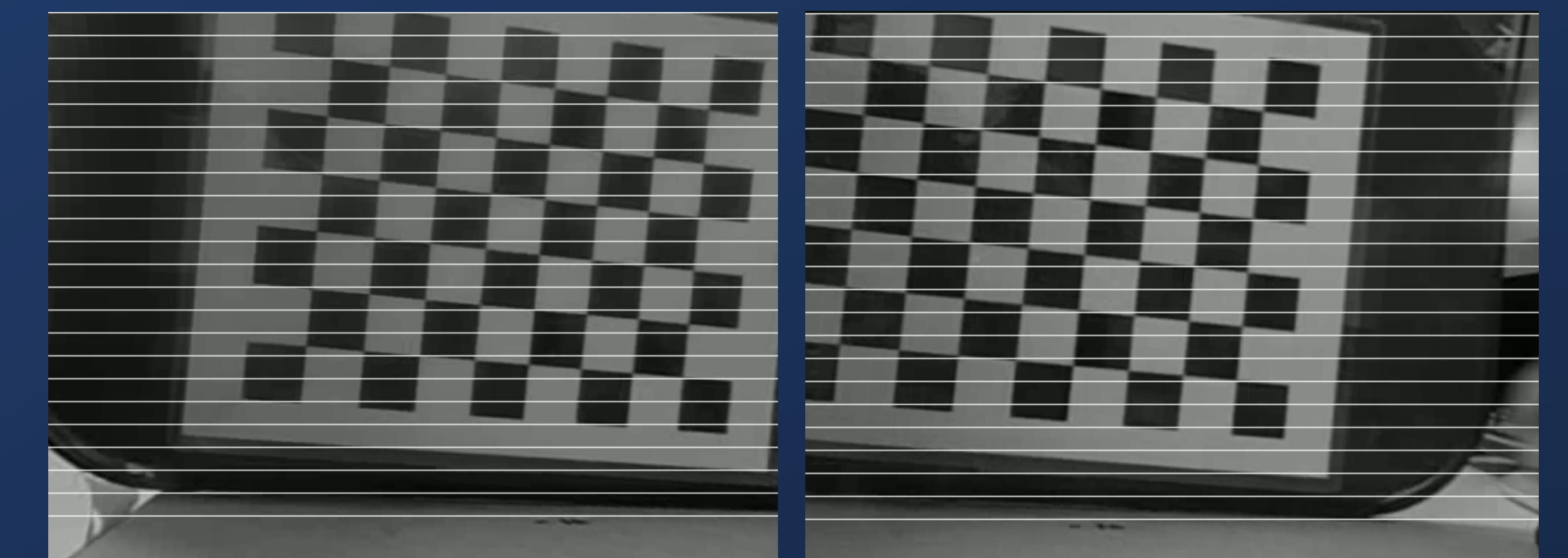
Printed Circuit Board with Soldered Components



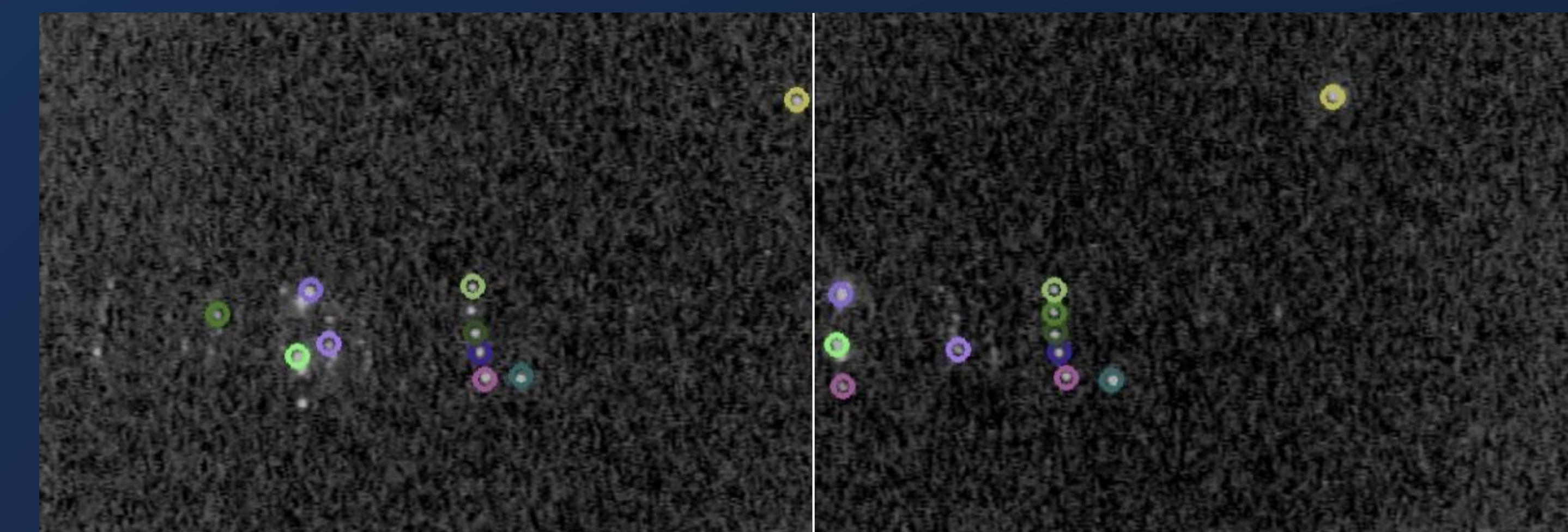
## Frame Synchronization Results



## Stereo Rectification Results



## Pulse Matching Results



Like colored circles in left and right feed correspond to same ostracod

## 3D Mapping Results

