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

**Frame Synchronization Results**
- Original: Left: Frame 743, Right: Frame 743
- Synchronized: Left: Frame 743, Right: Frame 743

**Stereo Rectification Results**
- Original:
- Synchronized:

**Pulse Matching Results**
- Left: Sample ostracod pulse pattern
- Right: Sample 3D mapped ostracod pulse pattern

**3D Mapping Results**

**Final Product**
Cameras and External Hardware

**Printed Circuit Board with Soldered Components**

**Background**
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