# SVS2 Project Objectives

The objective is to provide cheaper camera rig hardware (at cost) and free survey processing and calibration software.

The intent is to enable Opwall (or other similar organisations) to move to newer cameras at a lower cost as possible. The software should be easy to use for people with limited survey experience. Ideally this will allow these organisations to survey reefs in more regions.

* Camera rigs should be easier and cheaper to calibrate
* Use standard readily available up-to-date GoPro cameras and housings
* Application should manage the moving of media from the camera into the application environment to avoid mistakes
* Software should try to detect the stereo camera synchronization method (torch flash)
* Software should try to detect the survey start/stop within the survey video using GoPro accelerometer telemetry (detect camera up/down)
* To provide assisted detection of fish species via a machine learning model
* Provide a mechanism to get an opinion from nominated fish ID specialists and for that fish ID opinion to feed back into the machine learning model
* The system should tolerate not always being online (batch upload and download of ID questions if necessary)
* Further extend the software to handle benthic survey with the application detecting the required survey point intervals on the tape
* To provide assisted detection for benthic ID via a machine learning model
* Provide a mechanism to get an opinion from nominated benthic ID specialists and for that benthic ID opinion to feed back into the machine learning model

I feel that full automated detection would be difficult at this time but should be worked towards. The nature of the benthic survey (the surveying of static entities) could probably be fully automated first.

Full SVS automation has the challenge that some fish are extremely difficult to tell apart. The subjects are always further away from the camera than the benthic survey subjects. Accurate identification is hindered by resolution and lighting level. Additionally the subject moves and should not be accidently re-counted (they can also move completely out of camera view and then return shortly after). With all that said humans ID the fish from these same video frames so it must be possible for software to ultimately do the same.