Aquatic Orchestra is an audio installation created by Semon Ganguly for the Bristol Aquarium. Essentially, it is a generative audio project that uses fish to create ever changing 16-piece orchestra music. It uses a camera to observe a part of an aquarium containing tropical fish. Using both blob tracking and colour detection algorithms the program tracks the position of up to 16 fish at a time using x and y coordinates and also detects its colour. The program creates a 16-piece orchestra using the colour of the fish, which corresponds to an instrument; the x-coordinate, responsible for the panning (left and right); and the y-coordinate of the fish, controlling the amplitude of the sound produced. This information is first mapped into MIDI signals, then passed to a Digital Audio Workstation to produce a seamless, immersive and ever-changing piece of music. This is then played back using surround sound speakers at each side of the aquarium. There is also an intractable touchscreen display present which allows the viewers to select a fish in the vision of the camera so as to isolate its sound which allows the viewers to better understand how one sound affects the whole performance. This device will also display educational information about the selected fish as well. This installation is aimed at an audience of three to six year old children as this may be especially interesting to this age group.

This project has been achieved with openFrameworks libraries using the C++ language. Multiple Computer Vision algorithms such as blob tracking and colour detection have been implemented so as to increase the accuracy of object detection. The program allows a threshold to be set into place which allows a range of colour values to be detected for each fish so as to compensate for blemishes and shadows on fish. It uses addons such as OpenCV and oFxOSC, both of which have been critical because of efficient well researched algorithms and ease of MIDI mapping ability respectively.

Figure 1. This picture is a visual representation of the project in a real setting.