Hardware – Parts:

- Logitech HD Pro Webcam C920
- SWAROVSKI Kit ATS 80 HD +Zoom 20-60x
- Ketchup bottle
- Flexible metal pot.
- A computer.
- A TV.

The principal parts:

1 Logitech HD Pro Webcam C920:

You will need a webcam full hd (1080p) at 30fps with digital zoom and compatible with windows 8 program, “Windows Camera”. The perfect camera is the Logitech HD Pro Webcam C920: http://www.logitech.com/en-hk/product/hd-pro-webcam-c920. This camera has a fast response time, it's necessary for example to follow the flight of a bird as a marsh harrier or a heron.

2 SWAROVSKI Kit ATS 80 HD +Zoom 20-60x

We need a telescope. The telescope that gives us sufficient quality is a SWAROVSKI, we tested with Kowa, Nikon, etc, but does not reach the required quality on TV FULL HD. We will use the 60x zoom, with maximum zoom: http://www.swarovskioptik.com/nature/ats-sts-c210202/ats-80-p5006334

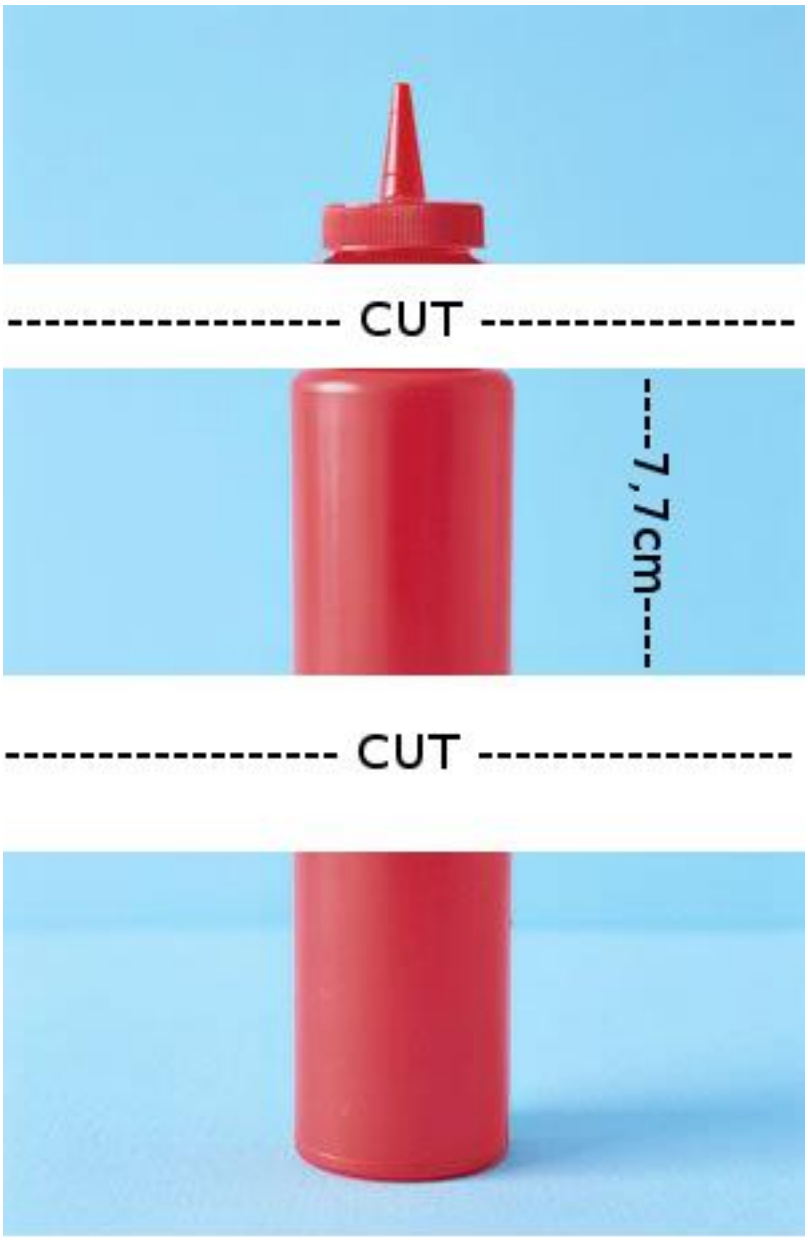
3 Ketchup bottle.

To attach the camera to the telescope, we have to build digiscope-style adapter. It has to fit perfectly into the eyepiece to prevent movement, which would result in losing the image.
There are some very expensive adapters In the market, but we can easily get through a bottle of ketchup;). There are many types of ketchup bottles too, but there is a very common type which fits perfectly into the eyepiece of Swarovski. Is as follows:

Dimensions: it should be 5.7 cm in diameter (inside).

4 Preparing the adapter.

Cut the ketchup bottle in half, and keep on half section measuring 7.7 cm. The cuts must be perfectly even. We recommend using a small portable grinding machine.



The next step is to attach the webcam to the "adapter". We did it with a silicone hot glue gun:

5 Test with the software.

As a preliminary test, place the adaptor in the telescope and see how it looks.

Plug the usb into the pc, and test it. Use the software "Windows Camera" of windows 8.0 (better than windows camera of windows 8.1), or use a program called Amcap. Adjust the resolution to 1080p, in the desktop and the camera too.
Both programs when shown full screen webcam will appear with vignetting. To remove it you have to use the digital zoom x2 in 1080p. It is best to use a 47" or more TV screen to show to your audience.
Logitech software gives you the option to set the digital zoom. For Windows Camera, there is a downloadable app from microsoft store that integrates camera options from logitech camera in the same Windows Camera, including the digital zoom. This app only works in Windows 8.0. This app is official from Logitech.

6 Assemblage.

If it looks right, it's time to assemble. This process is craft, with a metal can coated with fiberglass. The metal can must be flexible to adapt to the telescope and be a good fit. A solvent can could be used, for example.
Be careful because the top of the metal must be embedded in the telescope and you cannot alter the distance of the camera adapted to the telescope.

7 Guide sight and enjoy!

If everything fits well, we can place on a tripod. It is advisable to put a guide sight to see a bird in particular, as we reach the superzoom we fail to move easily in the lagoon. A pipe or a telescopic sight glass solves our problem.

If you have any questions, contact us. In the future the entire assembly could be improved by using a 3D printer to fabricate the adapter and housing, all together at once. We'll see.