

# Proposed Solution and Subsystem Breakdown

Group 8

## Problem Statement

Ben, a PHD student at the Fitz-Patrick Institute, is studying Southern, Yellow-billed Hornbills and Fork-tailed Drongos in the Kalahari. He is trying to understand why Hornbill's breeding success has decreased with the increasing temperatures while the Drongo's breeding success has been mostly unaffected. He needs a way to reliably capture footage of the Drongos throughout the day as his current methods are unreliable.

## Proposed Solution

We would like to create a camera solution that would comprise of its own power, footage capture, bird sensing, data storage and retrieval. The power must be able to supply the device for at least 5 days, if not indefinitely. It will ideally consist of a solar panel and battery. The camera should be able to capture enough definition and capturing the bird at night. The triggering mechanism will be using multiple sensors including passive infra-red, pressure, sounds and mm-wave. Lastly, an ESP processor will be used to manage the sensors, capture footage data, and host a local server such that the data can be downloaded through a local website.

## Subsystem Breakdown

Subsystem	Description	Student Number
Power	Power the full subsystem for 5 days or longer using batteries and a solar panel.	MTLTHA070
Electronics	Detect when a bird is present using a variety of sensors. Have a camera that is capable of capturing footage during the day and night. Use an ESP to coordinate camera, sensors, and data storage	STLMOU001
Hardware	Create casing that is able to house the full extent of the project and is mostly disguised or hidden.	CLRCAM007
Software	Create a local host server where the data can be downloaded from via a local website. Communicate with the sensors and record and store camera data when applicable	LNTZUH001