

# Faculty Of Information Technology

## Automated Camera Stand

Group 47

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## Introduction

Wildlife photography is a popular category of photography, done by beginners, enthusiasts, and professionals. When taken technically, it involves shooting any type of animal. From birds to insects to butterflies to mammals. But wildlife photographers most commonly take photos of mammals, reptiles, amphibians, and birds. Wildlife photography is a loosely defined profession that demands a passion for nature and art. These photographers make a career of traveling to remote areas and taking pictures of wild animals and natural scenery with a risk.

Wildlife photographers are some of the world's most valued professionals. According to the U.S. Bureau of Labor Statistics, the average annual wage of most wildlife photographers was \$50,290 per year, or \$24.18 per hour, as of May 2020. So, this is a higher-paying job. Due to this reason, many new photographers have come to this field. And most wildlife photographers are freelancers. The amount of money that a freelance wildlife photographer makes is largely determined by his talent and ability to get decent-paying work. From all these things it is crystal clear that wildlife photography is one of the best careers in the world.

Wildlife photography is one of the most dangerous professions in the world. The following instances are examples of the dangerous which happen for wildlife photographers. One such incident happened in May of 2000 when a female wildlife photographer was attacked and partially eaten by a 112-pound female black bear in Tennessee. Last year in Colorado a wildlife biologist and photographer, Tom Mussel, got too close to a cow elk and her calf, and he was attacked when he stumbled as he tried to escape the charging cow. Elk and deer will attack humans when they feel cornered or threatened. A southern California man killed by a grizzly bear in Alaska's backcountry was shooting photos of the animal that killed him just moments before the attack, a National Park Service official said Sunday. The bear that killed Richard White, 49, was still with his body when rangers found him in Danail National Park, the official said. Photographs found in his camera revealed that White was watching the bear for at least eight minutes near a river before the attack.

From our project, we mainly focused on avoiding the danger for the wildlife photographer and the safety of the camera. In this period many wildlife photographers are dying while taking photos due to animal attacks. We are going to introduce a new device to avoid such a problem. It is an Automated Camera Stand.

## **Problem In Brief**

In modern cameras, we have the feature to take remote photos. We call it remote photography. Therefore, we can take pictures even if we are far from the camera. But there is no way to bring the camera near to the animals rather than a person carrying the camera.

From the photographer's side:

- Danger to the life of the photographer.
- Time wastage of the photographer.
- Can't find a good angle to take a photo.
- Can't get close enough to the animal.
- Constantly changing lighting conditions.
- No safety to the camera.

From the animal's side:

- Animals get scared when we try to reach them.
- The behaviors of the animals may change.

From the environment side:

- Bad impact on biodiversity

## Aim & Objectives

### ~~Project~~ Aim

**Automate** the distance photography process to make sure it is safer and effective.

### ~~Project~~ Objectives



- Rotate the camera both vertically and horizontally.
- Move the stand according to the given GPS coordinates.
- Reach the target safely.
- Protect the camera from the animals by using the alarm.
- Control the camera holder using a remote controller.

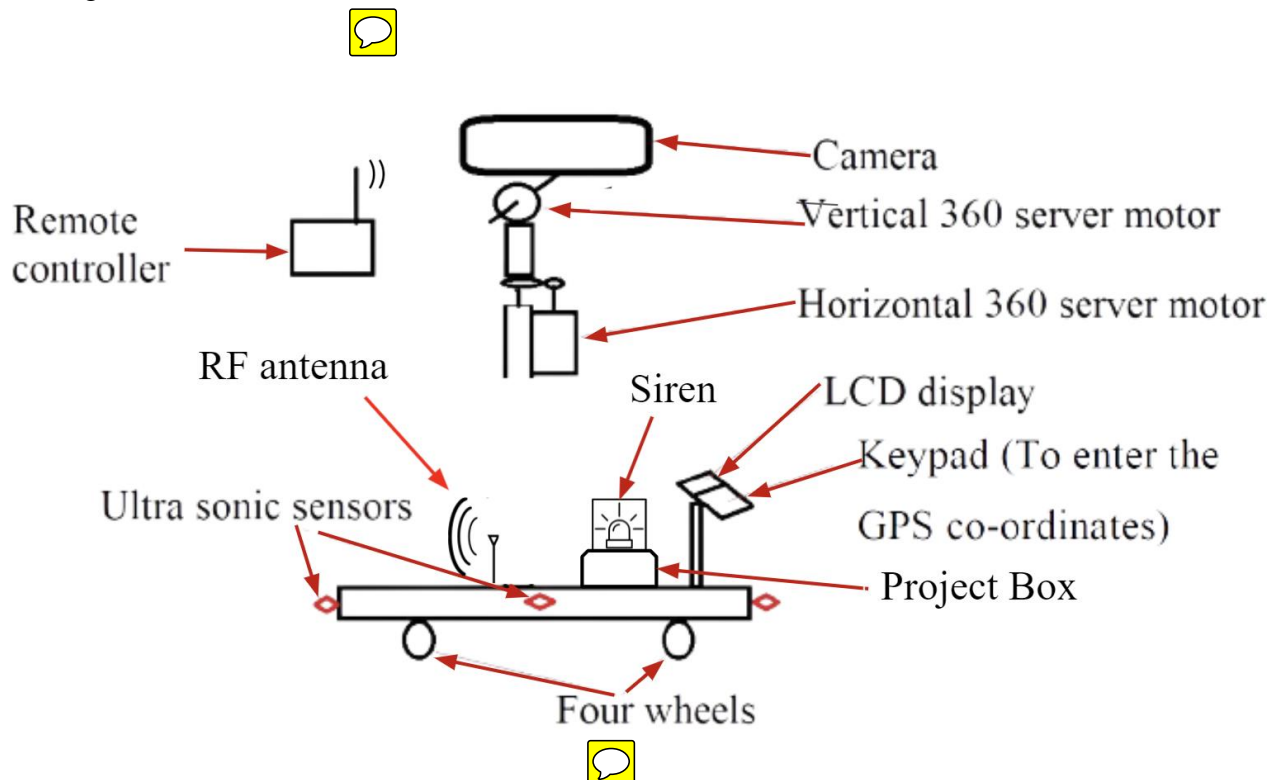
## Proposed Solution

As the input, we use a Remote Controller, Keypad, GPS Sensors, Compass Sensors, and six Ultrasonic Sensors. The output devices are Gear Motors, Servo Motors, Display, and a Siren.

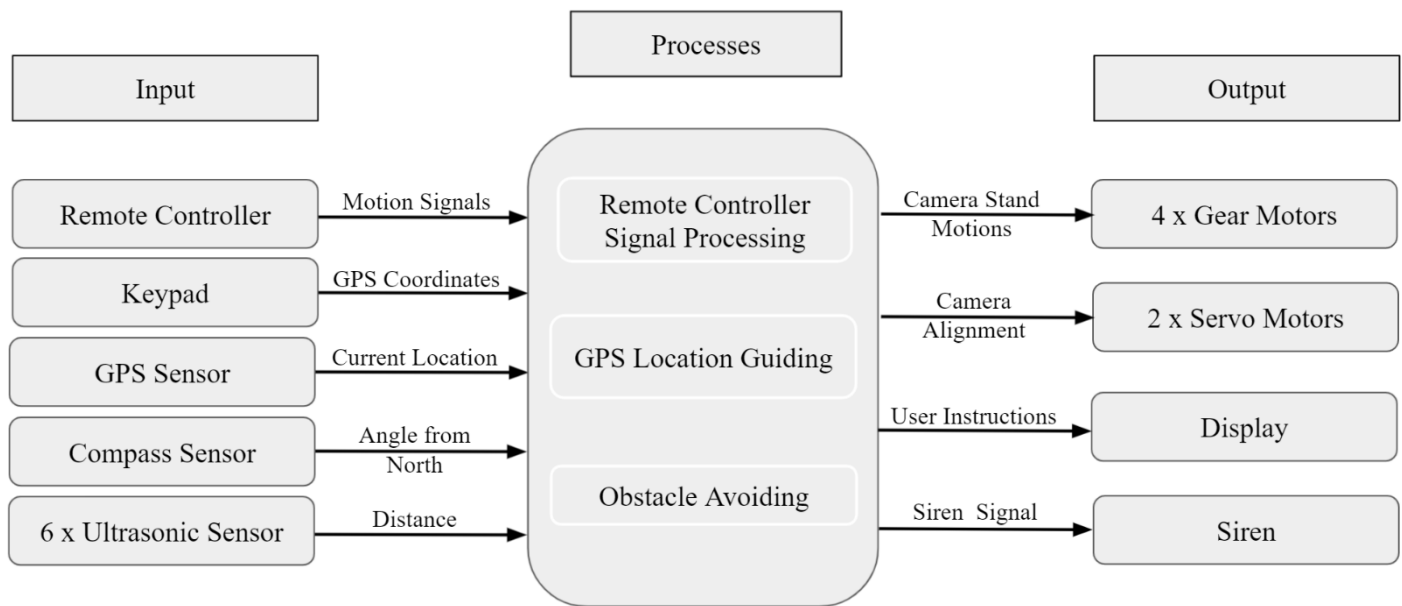
In these processes, the remote controller provides the motion signals to gear motors and servo motors. We use radiofrequency technology to communicate with remote controller and camera stand. And provides a signal to sound the siren when the animals come to attack the camera stand. By rotating these servo motors, we can rotate the camera 360 degrees horizontally and vertically using the remote controller. The camera stand can move forward using gear motors.

The keypad gets the GPS coordinates that need to go to a required place. To find the current location we use GPS sensors. Then the camera stand finds the current location and reaches the required place accurately. When we get GPS coordinate inputs from the user, we can see these coordinates in the LCD display. By using the compass sensor, we can take the angle which we need to implement a GPS location guiding algorithm. By using ultrasonic sensors, the camera stand can avoid obstacles and go ahead according to the given GPS coordinates. This is our overall proposed solution.

Things which we can do using the remote controller are as follows. We can rotate the camera vertically and horizontally 360 degrees. And we can move the camera using the wheels (That part can also be done using the GPS guiding method too). And the siren works only by using the remote controller.



## Block Diagram



## Resource Requirement

- Atmel Studio (Microcontroller Coding)
- Membrane Keypad - 16 Key
- HC-SR04 Ultrasonic Sensor Module
- NEO-6M GPS Module
- L298N DC Motor Driver Module
- Servo Motor
- Atmega32 Microcontroller
- 11.1V 2200mAh 3S 25C Li-Po Battery
- 12V 2000mAh Li-Po Battery
- 68mm RC Car Tire Wheel
- Liquid Crystal 16x2 Display Module
- 2 Pin Switch
- Thumb Joystick Module
- RF 433MHz Transmitter/Receiver
- GY-271 Electronic Triple Axis Compass Module

## Action Plan (Appendix)

Action Plan														
Responsible group member	Task	Duration	Start Date	End Date	Completion Date									
1 204074M	GPS sensor	2 week	20/09/2021	3/10/2021										
	Compass sensor	2 week	4/10/2021	17/10/2021										
	LCD display	1 week	18/10/2021	24/10/2021										
	Keypad	1 week	25/10/2021	31/10/2021										
	GPS location guiding	3 week	01/11/2021	21/11/2021										
2 204087F	Ultrasonic sensors	3 week	20/09/2021	10/10/2021										
	Gear motors with wheels	1 week	11/10/2021	17/10/2021										
	Obstacle Avoiding	2 week	18/10/2021	31/10/2021										
	Motor Controlling	3 week	01/11/2021	21/11/2021										
3 204047J	First Joysticks - For servo motors	3 week	20/09/2021	10/10/2021										
	RF Transmitter	3 week	11/10/2021	31/10/2021										
	Programming	3 week	1/11/2021	21/11/2021										
4 204150T	Servo motors	2 week	20/09/2021	03/10/2021										
	Alarm	2 week	04/10/2021	17/10/2021										
	Triger Alarm	2 week	18/10/2021	31/10/2021										
	Servo Controlling	3 week	01/11/2021	21/11/2021										
5 204179N	Second Joystick - For motions	3 week	20/09/2021	10/10/2021										
	RF Receiver	3 week	11/10/2021	31/10/2021										
	Programming	3 week	1/11/2021	21/11/2021										



## References

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- [02] <https://lankatronics.com/>
- [03] <https://microchip.lk/>
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