# ANTI-ANIMAL TRAMPLING SYTEM
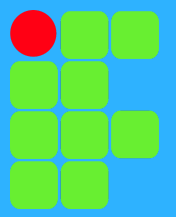
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## ⚠️ Problematic ⚠️

The biggest cause of death of wild animals in Brazil is trampling (mainly on roads), overcoming hunting, deforestation, pollution and traffic. Every second 15 animals are victims of car accidents in Brazil and, per year, 475 million are killed for the same reason. [1], [2]

## Solution

This project aims to present a system capable of reducing the number of automobile accidents involving animals through visual alerts, as seen in figure 1
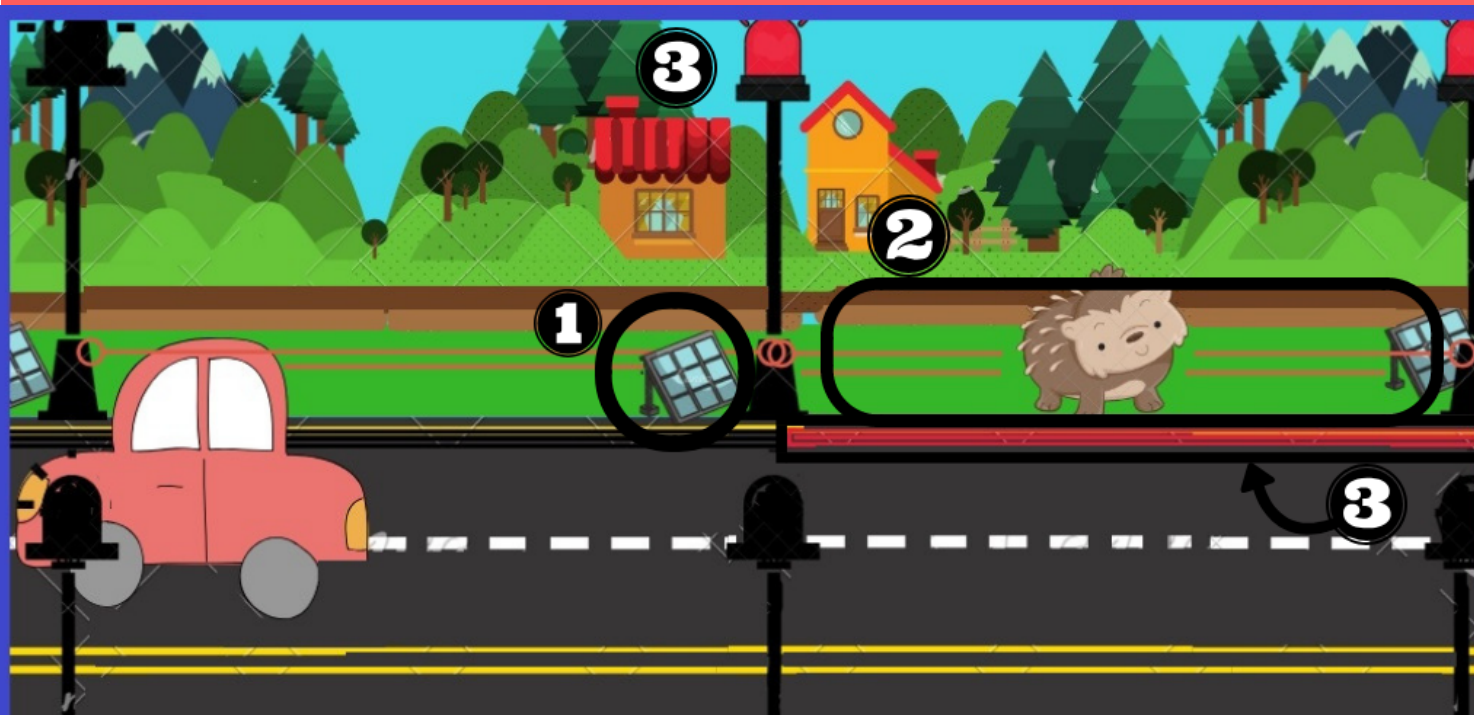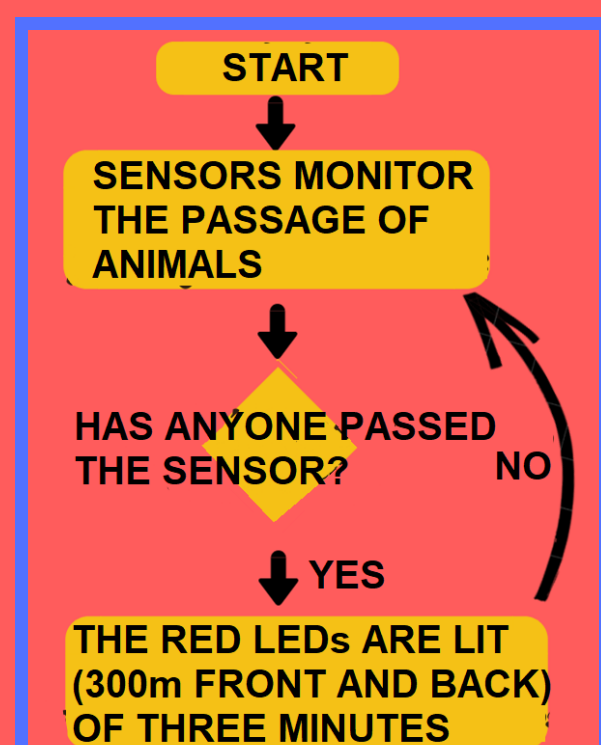


Figure1 - Schematic illustrative of the project implementation

A solar energy system (1), composed of the pair of active infrared sensors (transceiver), is installed between one pole and the other. The transmitter (2) emits infrared light signals, while the receiver receives them, forming a mesh of lines invisible to the naked eye. When this is interrupted, it means that an animal is near the road, thus activating the LED strip and a light (3) to inform the driver that an animal is passing by the road.

The basic components of the system, shown in Figure 3, are an IC 555 that will be used to keep the indicator lights on for three minutes, the solar panels power the batteries that keep the circuit active.



**START**

**SENSORS MONITOR THE PASSAGE OF ANIMALS**

**HAS ANYONE PASSED THE SENSOR?** → **NO**

↓ **YES**

**THE RED LEDs ARE LIT (300m FRONT AND BACK) OF THREE MINUTES**

Figure 2 - Flowchart of Operation

Based on the maximum speed allowed on highways in Brazil (110km / h), the 300m value was adopted for both directions, so that drivers are alerted on both sides of the track in time to reduce speed to avoid a possible accident
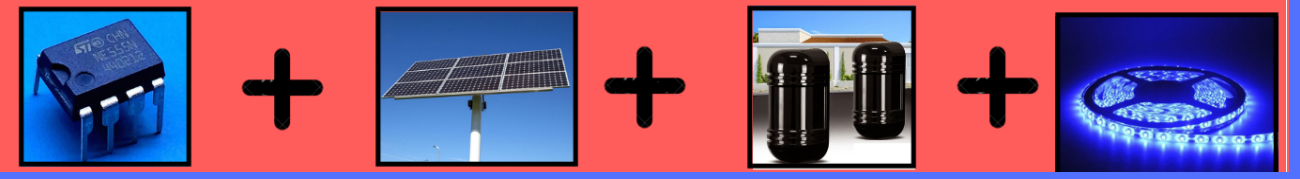


Figure 3 - Main components

Figure 4 shows the simulation of the design, where the switch symbolizes the signal sent by the infrared sensor indicating that the light beam has been interrupted, thus triggering the IC 555 that illuminates the indicator light.
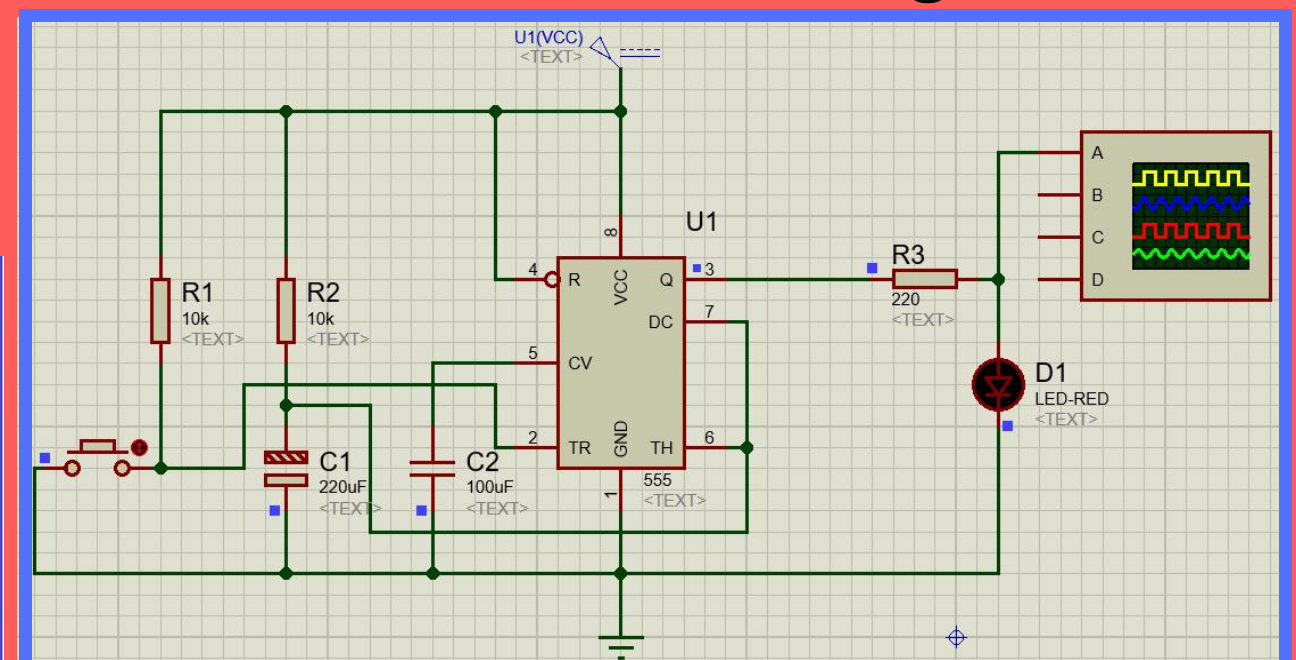


Figure 4– Simulation software "Protheus"

## Final considerations

The tests carried out with the project presented satisfactory results mainly in regard to applicability, since once installed, it has the capacity to save lives of both animals and humans. However, to implement a project of this magnitude on the country's roads, investor support would be the best alternative.

This project was presented at the First Lego League robotics tournament – Animal Allies Season in 2016 The advantages of its application extend to the economic areas, where it would reduce the expenses with the construction of ecological corridors and with programs of rescue to injured animals; environmental, where there would be a reduction of the animal mortality index, preservation of medium and large and social fauna, with the reduction of accidents on the roads involving humans and animals.

### References

https://www.bbc.com/portuguese/noticias/2015/10/150924_atropelamentos_fauna_tg [1]

https://sao-paulo.estadao.com.br/noticias/geral,a-cada-15-segundos-um-animal-morre-nas-rodovias-brasileiras,70002262363 [2]