



## Project Title

*(Try to choose a catchy title. Max 20 words).*

**Theft Detection System**

## Student/Team Information

<b>Team Name if any:</b> <b>Team # on Canvas you have self-signed-up for:</b>	<b>The Outsiders Group 8</b>
<b>Team member 1 (Team Lead)</b> (Lastname, Firstname; SDSU email; picture):	Brandt, Michael – mbrandt6627@sdsu.edu 
<b>Team member 2</b> (Lastname, Firstname; SDSU email; picture):	Thota, Vijay Kinnera – vthota5094@sdsu.edu 

## Updated Project Approach (10 points)

*(Describe how you plan to articulate and design a solution, architecture you are finally using and communication protocol (Wi-Fi, BLE, ...). Include all project milestones as well. Max 300 words).*

Our proposition is to implement a Theft Detection System that combines IoT and computer vision technology to keep a watchful eye on high-risk areas to detect unauthorized activity. Our system is affordable and accessible to everyone by using simple IoT devices and cloud computing. Once the system is installed, users can receive real-time alerts if any dubious activity is detected, allowing them to take quick action to prevent theft or damage to their property. Our primary aim is to create a trustworthy and economical theft detection system that can be accessed over the internet using basic hardware. To overcome the shortcomings of existing solutions, we automate the system by using minimal sensors and efficient image processing methods.

Our milestones are as following:

1. Find a driver for the OV 7670 camera.
2. Use the PIR sensor to take a picture when motion is detected.
3. Set up the AWS webserver to accept image data and send a text alert.
4. Send the image data to the webserver.

## Updated Hardware Components (5 pts)

*(The final list and quantity of the required components for the project)*

Component/part	Quantity
Lillygo TTGO	1
Camera Module (OV7670) <a href="#">link</a>	1
Buzzer	1
PIR sensor	1

## Project Tasks completed so far (15 pts)

*(Describe the main tasks that have been assigned and already completed. Max 250 words).*

Task Completed	Team Member
<b>Researched how to create a webserver</b> We both researched how to create a webserver using AWS that is capable of receiving inputs. With lab 3, we have also had practice making a webserver.	Michael and Vijay
<b>Attempt to connect camera to TTGO</b>	Michael

I am trying to connect the camera module to the TTGO, but as stated below finding a driver that works is proving to be difficult.	
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## Challenges/roadblocks (10 pts)

*(Describe the challenges that you have faced or are facing so far and how you plan to solve them. Max 300 words).*

Finding a driver for the OV 7670 has proven to be very difficult. I have tried many options and they either do not compile on my machine at all, or compile but return errors when trying to connect to the camera. I will continue to research options and visit office hours for help with finding a driver that works with the TTGO and platform IO framework.
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## Tasks pending (10 pts)

*(Describe the main tasks that you still need to complete. Max 250 words).*

Task Pending	Team Member
a) Executing the module (SimpleCV File). b) Dumping the SimpleCV file in the microcontroller. c) Interfacing physical components (Buzzer, PIR Sensor, Camera (OV76760)) to the microcontroller.	

## Weak points / Future work (15 pts)

*(Mention at least two points of your project that have room for improvement. These points can be additions to the existing project setup (components) or improvement of the current implementation. Max 200 words).*

- We can use Machine Learning or a Neural Network to detect the missing object in place of a simple image processing technique.
- We can use an advanced microcontroller and updated camera module for better results in terms of performance and energy consumption.
- There can be higher level alert systems developed instead of the Buzzer alert system for theft detection that is being used in our project.