ESE 4009: EMBEDDED SYSTEM DESIGN PROJECT

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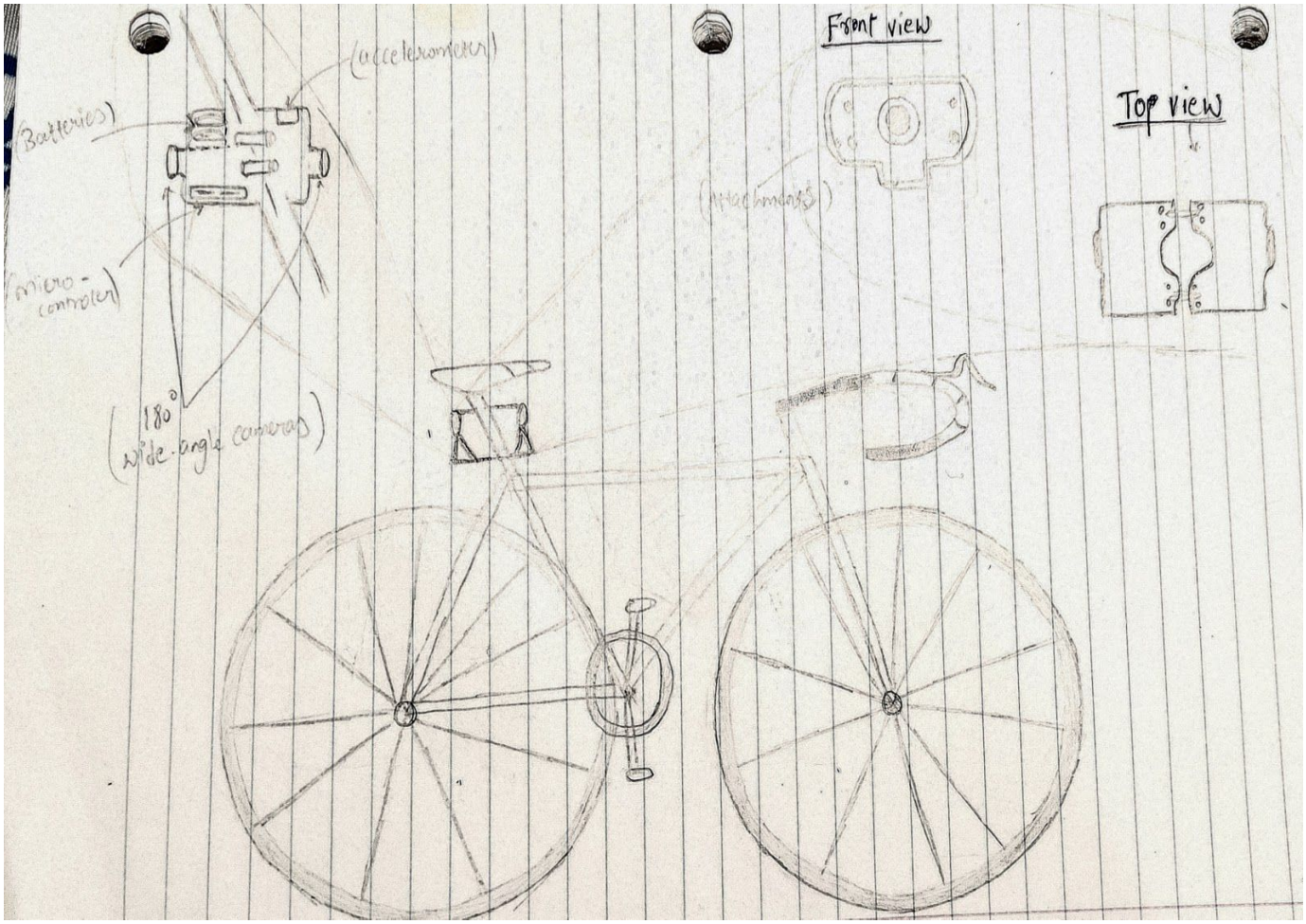
1) Smart safety box for bicycle

In today's world we are having so many safety features in cars as well as motorcycles but when we take a look at bicycles they do not have any such safety features. If we can create a safety parameter such as a 360 degree camera using a Smart Safety Box which is attached to the bicycle handle it will work as a dash cam for the bicycle.

In the smart safety box we are using, the Raspberry pi-4 and it has only limited space available it can record every 30 seconds video and if there are no sudden spikes, it can delete that photage. Also,whenever there is any sudden crash or got hit by any vehicle it will store that particular 5 minutes of video of the entire incident which can help the police for later investigation.

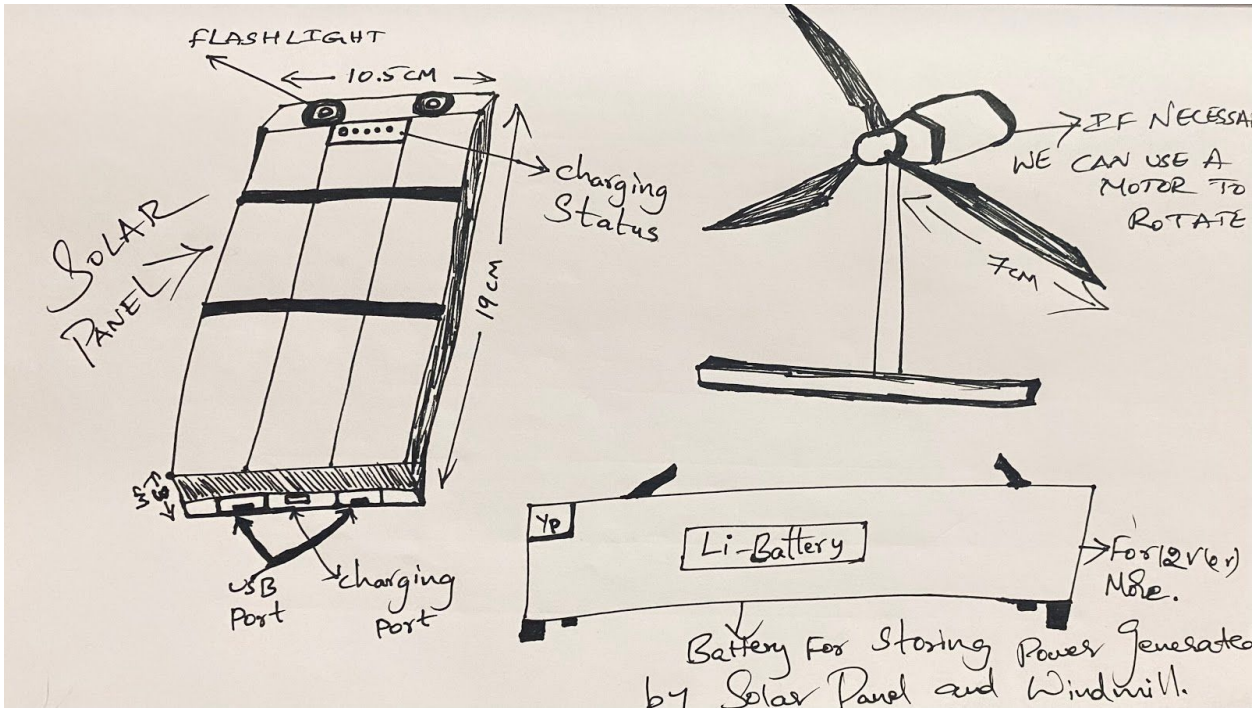
Also, as we are adding a GPS module in the smart safety box we can track the bicycle wherever it is, if it was stolen or lost.

Most of the cars and heavy vehicles have dash cams which will help them a lot when they have hit other vehicles or being hit by any vehicle,also in getting insurance and proper investigation.


(accelerometer)
(Batteries)
(micro-controller)
180°
(wide-angle cameras)
Front view
(brackets)
Top view

2) Smart solar and windmill power generator

According to renewable energy experts a small ‘hybrid’ system that combines wind energy and solar energy concepts together which gives additional benefits over a single system. In most parts of North America the sun shines brightest and longest whereas wind is low in the summer. Because the peak output time for both solar and wind occurs at different times. Hence the hybrid system will produce more power when you need it.
We are looking for the portable version of the same hybrid system. We can think of a portable wind turbine with propellers and solar panels connected to it. If we can produce enough energy to charge mobile via USB then it will be helpful in the remote location if a person is running out of battery. It can be useful for charging mobile phones, portable LED lights or even power bank.




NATURE'S
GENERATOR

3) Smart bag

Many people are not satisfied with the normal bag they are using.They need some extra features that can make their work easy. So we decided that we can make a smart bag which includes different features by using the embedded technology.We will add a Gps module to track the location of that person if he/she is lost.It will also have LDR sensor that will turn ON a strip of LED if its a night time.Further more we will add a panic button that will provide the safety for the user.It will also have a camera that will be used to detect the suspicious activity

Additionally we can also add a smart lock based on face recognition and health tracker which will be helpful for a user.