**Electronic Tracking Collar (ET-Collar)**

**(Simarjeet Brar, Singh Gurpreet)**

1. The name of the project and the team members.

The name of the project is Electronic Tracking Collar (ET-Collar) And the team members are: Simarjeet Brar and Singh Gurpreet.

1. The summary of your projects, including what kind of project you are planning to perform, and what is the background of your project. Meanwhile, what courses and the topics are related to this project? Please remember the project needs to be a real-world example and it is better to build the APP that will be supporting your hardware in CENG 317 course

ET-Collar is a device that helps you track your pet animal or zoo animals to keep track of that animal’s position and activity of the animal (distance travelled) so that you don’t have worry about if your pet gets lost. Usage is very easy it does not include any type of surgery you can just put out et-collar around the neck and you’re good.

Gurpreet worked on the MAX30105 during CENG317, the mentioned sensor is a heart rate sensor and Simarjeet worked on TSL2561, which is a Light Sensor.

Moreover, as our sensor does not seems to have many outcomes together, so we decided to implement another sensor instead of the MAX30105.

In conclusion, we are going to use LIS3DH, GPS6MV2 together with the TSL2561 to build a device that keeps track of the location, distance and environment an animal goes through. The first new sensor is an accelomenter and the second one is a GPS.

The courses related to the project are: CENG254 – Database with Java: in this course we learned how to design databases and how to operate with them through java, TECH150 - Electronic Devices and Circuits: this course gave us an a base on how wiring is done and how circuits work, TECH153 – Technical C: this was the first time we worked on a project and I2c, CENG319 – Software Project: where we learned how to develop android applications and how No-SQL DB works and CENG317 - Hardware Production Technology where we learned how to build our custom PCB and operate with a sensor

1. Technically, what is your plan to implement the project? Where would you get the data from? How do you manage the project during the semester? What is your workload assignment for team members? For the cellphone APP, I would suggest you think about the design of the system which includes at least the following screens(functions) :
   1. loading screen;
   2. Log in and register screen;
   3. Database setup and connection function;
   4. Data display screen(s);
   5. Setting screen and menu bar;
   6. Sort the data in a hierarchical level, for example, main screen -> Category screen -> Detailed screens, etc.
   7. Help screen and “About” screen;

Depends on your project, there are some other screens you may want to consider for implementation. Such as control, shopping cart, input/output message, security questions, open website, etc.

We are going to implement the project in parallel, software and hardware. As one of us have already an android application almost complete we will work on it and add/modify the functionalities as needed.

Regarding the hardware part we are planning to work on what we already have (the TSL2561 ) and add a an acelometer and GPS sensor on top of it. Furthemore, we are going to use the raspberry pi as the platform for our device.

The data retrieved from the three sensors will be pushed to Firebase, once the data is pushed to the DB then the android application will retrieve it and display it.

As a team of two member, each of us will focus on one specific part: Hardware and Software, while keeping up and integrating everything based on the deadline. Gurpreet Singh will work on the hardware and the integration of the two sensor, Simarjeet will be working on the android application making the necessary modification to the basic app we already have. Then firebase will be handled together on both side Hardware and Software.

1. What is the time estimation for your project? Can you finish it on time? If there is any problem in the middle, what do you plan to do to make it back to track?

We estimate to have everything ready and working by the midterm (March 1st) and after that we will be focusing on perfecting the product and making it bug free.

As planned we should be able to finish on time, as we are more behind than other groups on our hardware, it is going to be challenging. However, we are going to try to put in more hours during the reading week, getting everything on track.

As we are working on team, if anything does not go as planned we are going to support each other and work as a team to stay on track or catch up if we are late. Moreover, as said, the reading week is going to be an essential week for our project, so if there is any error we can work on it during that time.

1. Are there any similar products already in the market? If so, please list them and mention your research findings and how your project will be different from theirs?

Yes, there are many products similar in the market, the most popular one are:

* PawTracker (<https://www.thepawtracker.com/products/the-paw-tracker-dog-and-cat-gps-tracker-gps-pet-tracking-devices>)
* Gibi pet locator (<https://www.amazon.com/Gibi-Pet-Location-Service-Unit/dp/B00MW70C9I/ref=as_li_ss_tl?ie=UTF8&qid=1468356606&sr=8-1&keywords=Gibi&linkCode=sl1&tag=13paws-20&linkId=71e9283068d21869b6d944c23a9756ec> )
* Pod 2 Gps (<https://www.amazon.com/Pod-WiFi-Tracker-Activity-Monitor/dp/B01D7XJRVE/ref=as_li_ss_tl?ie=UTF8&qid=1477509569&sr=8-1&keywords=pod+tracker&linkCode=sl1&tag=simables-20&linkId=6b10bb6fbc6b12c2603c56c663050ff1> )

See( <https://www.thepawtracker.com/blogs/the-pet-tracker-blog-by-the-paw-tracker/84621315-top-13-gps-pet-trackers-dog-and-cat-cell-phones-best-of-2016-reviewed> for more detail)

This tracking gadgets are produced by big companies and are much more sophisticated than our product, however, our goal is to make a simple device than can be built by anybody following our build up instruction. Our main goal is not to make a device competing with the above ones, but make a device that is easily reproducible by anybody without a background in computer engineering.

1. Can you list a few test cases at this stage?
   1. Total time it takes to record readings and display them on screen
   2. The accuracy of the readings.
   3. Application functionality
2. Conclusion

This is a challenging project but we are confident we will be able to meet all the deadlines and finish on time. It might be challenging to get our accelerometer and GPS working and connect the whole device to the firebase database and to the application to work properly, but that is part of the learning process.

As a team of two people we are going to divide our workload and use an Agile methodology and keep testing and integrate the two part of the project.