ITSP 2015

Team:38

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Motivation:

We, the students of IITB, have to walk a lot in the campus to go to the lectures, workshops,labs as well as other activities. Currently we use the Tum-Tum facilities

which are not so reliable. So we thought of making something by which

we can reach the destination with minimum efforts and within least possible time. Also, it would be great if the board is affordable and retractable so that we don't hesitate to carry it anywhere.

And then came the wonderful idea of retractable Electronic cum sensor controlled skateboard.

Broad Vision:

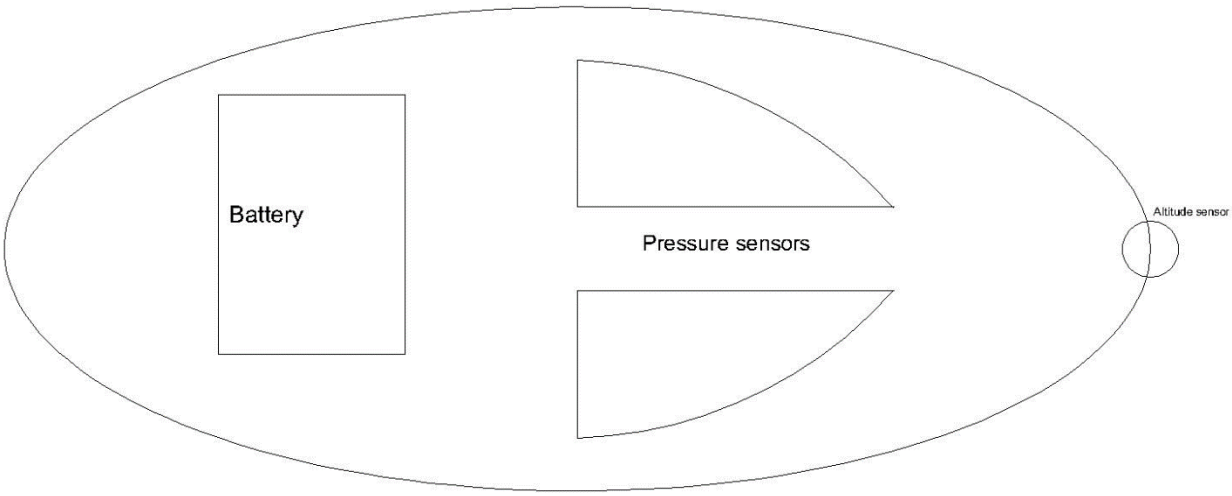
- We see our project to impact the daily life of students who live in a campus where they need to walk/travel much.
- We also see our project to be used in such places where travelling via skateboard doesn't cause other people hindrance so that people save a lot of time as well as their mechanical power.
- We are hoping to affect the present and future coming generation.
- If made affordable, retractable, long lasting, valuable we see our project to be in markets in future.

Demonstration:

It will include all the components used and the technology used (along with the cost) in the project and full-on working of the skateboard with the sensors being demonstrated.

Working:

- It will be oval-shaped so that we can stand on it with both the legs facing in front.
- Wood will be used as chassis with some foldable (retractable) techniques.
- Its will be controlled by using altitude sensors.
- Differential will also be taken into account while taking a turn.
- For turning it, voltage increment/decrement will be used using piezo sensors.
- For making it retractable, we will try to make it as light as possible.
- Altitude sensor will be installed at the front tip of the skateboard. The gesture of moving the skateboard ahead will be a hand above that sensor. The sensor will measure the distance of that hand from the bottom and according to that will translate the distances to the speed of the skateboard. So, when we move the hand down, the distance will reduce and the speed will increase and vice versa. Of course, calibration will be done each time so that the height of person riding the skateboard doesn't matter.
- Pressure sensors will be of piezo electric substance. This will be installed beneath both the legs. This will be used for navigation. The difference in the pressure beneath the two legs will cause the difference in the speed of the two pairs of tires. Thus, succeeding in connecting with the differential mechanism for navigation.
- The extraction of data from the two sensors will be in the form of altitude and pressure respectively by using an Arduino. Calibrating the absolute value of altitude obtained with the speed and the difference in pressure in the two limbs with the differential. The appropriate equation will be studied on and will be decided later.



Timeline:

- Week 1: Learn all the required softwares and search for best retractable material.
- Week 2: It will be mostly devoted in doing the electrical part of the project.
- Week 3: It will include the piezo sensors and altitude controlled parts.
- Week 4 and Week 5: Bugs will be tested and repaired.
- Week 6: More thorough test drives will be done.

Skills:

We have the whole idea or rather say the structure and working of the project.

We are hoping to learn techniques/science like:

- Electrical implementation
- Materials to be used
- Altitude sensors
- Piezo Sensors
- Team Work

Software/Workshops required:

- SolidWorks
- Arduino
- Eagle

- How to implement piezo and altitude sensors
- Microcontrollers

Estimated Cost:

12K-15K