



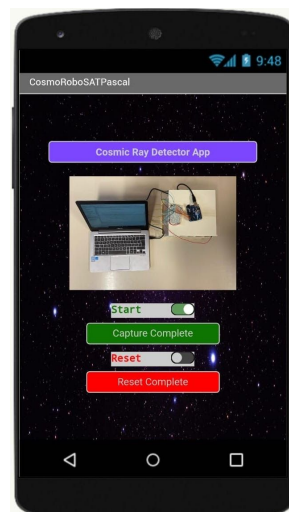
Idea Presentation Document - ZeroRobotics CosmoRoboSAT_Pascal

Mission objectives -

The aim of the proposed Space Mission is to track and analyse primary cosmic rays, then send the acquired data to a downloadable smartphone app.

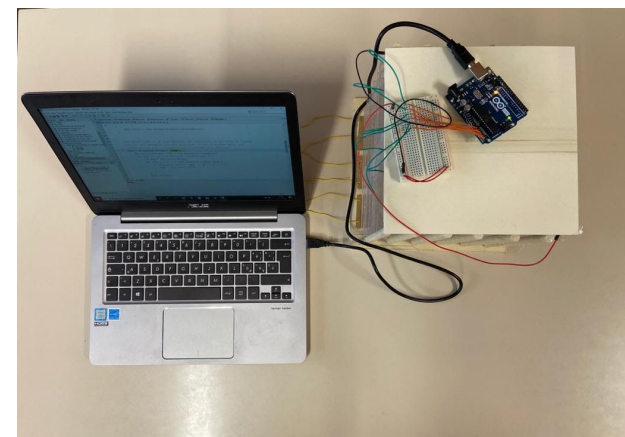
The experiment is expected to detect and determine the passage and direction of primary cosmic rays to establish eventual correspondence with measurements coming from the EEE project.

The expected mission duration is 5 to 10 years.



Experiment description -

The project will be based on the MRPC chamber system. It is composed of three identical chambers assembled one on top of the other. These chambers are made of, starting from the bottom, a number of vertical copper strips (the number of which still needs to be decided due to technical limitation of the "Arduino"

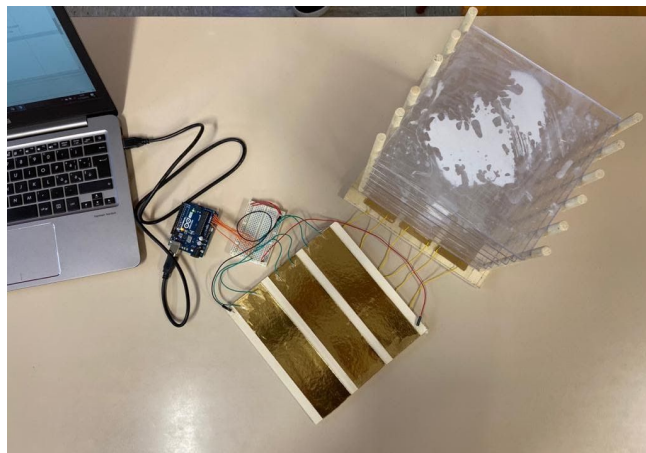


platform). Then we have a thicker glass sheet covered with a conductive paint, this, along with a similar glass sheet on the opposite side on the chamber, will make the cathode and the anode which will create the electrical field. Next, we have a number of thinner glass sheets each separated by a small gap (around 250 microns) filled with gas (mainly freon). Once the electrical field is created, a sensor inside the chamber will send analog electrical signals to the Arduino, which will be connected remotely to the CosmoRoboSAT app developed by us, and therefore will analyse and process the electric

signals received from inside the chamber, and will display the final results to the user.

Proposed method -

The chamber will receive power directly from the Arduino. The copper strips will each have two connections to the Arduino module via wires. The Arduino will determine the coordinates of the point where the primary cosmic ray has passed, the y coordinate will be determined based on which copper strip has actually been hit, whilst the x coordinate will be determined based on the delta time between the electrical readings at each end of the strip.



Scientific and technological aspects -

The physical, mathematical, technological and scientific aspects that need to be addressed to complete the experiment are:

- Earth's orbits, cosmic rays and how to detect them accurately
- The electric current and how the electric field works
- Knowledge of Arduino and JAVA languages in order to develop the app and implement the software which allows to control the communication between the sensor and the Arduino and to analyse the acquired data.

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