

INTRODUCTION

Hundreds of thousands of years ago, the universe as we know started as a hot environment that created tiny particles. These particles started grouping together, creating the first atom, hydrogen, and later on, helium. Those atoms gathered together, and created stars. The gravity of the stars joined together debris of the big bang. These debris started crashing towards each other creating what we know as planets and their satellites. An example would be our solar system which includes the planet Mars.

Mars has an atmospheric pressure of 0.636 kPa, a gravity of 3.7 m/s², and a surface temperature of 210 K, while Earth has an atmospheric pressure 101 kPa, a gravity of 9.8 m/s², and a surface temperature of 184 K. For this and many more reasons, Mars is a planet incapable of sustaining life. This is why we have created a group of sensors to help explorers understand and find solutions to the factors that make the planet and inhabitable planet.

PROBLEM TO SOLVE

A problem that the explorers in Mars face is the fact of unknowing the amount of distance they can travel without wasting too much energy, or when their body is dehydrated. They also have to confront the lack of knowledge of the meteorological signs that foreshadow the coming of a storm. One more issue explorers face when in Mars is not having enough resources to maintain their energy, such as food and water.

Not being able to control the variables in weather makes it harder for humans to stay alive in Mars, therefore studying these variables first hand with sensors will help us understand the conditions of the planet and it'll make it easier to survive in it in a non-distant future.

OUR SOLUTION

The idea is to implement a sensor on the inside of a device inspired by a gadget previously created called EveryWear. This device works as a data collection system that uses wearable, small sensors that sends the information gathered to a space station, iPad tablet, or computer, through wireless internet or bluetooth. This sensor sends signals to the explorer and to the database, letting them know that the astronaut is dehydrated or when the explorer can't keep on traveling otherwise they won't have enough energy to return to the base. This sensor will also help the astronaut have control of the energy its losing and saving. One more group of sensors we're adding is a temperature sensor, atmospheric pressure sensor, radiation sensor, and a wind direction sensor to the GPS that will be located on the bases and will be working with the help of the satellites. Our senros will work with small solar panels. This will make our senros candidate for clean energy options.

In addition to the sensors mentioned before, we're going to add a head-up display to the extravehicular visor of the astronaut helmet. This head-up display will exhibit the data the

sensors are sending to the database directly to the astronaut on the helmet glass. For this to work correctly, the coding of the sensors, the head-up display and of the database will have to be changed in order for them to be connected and for the information to be shared with all parties.

RESOURCES USED

NASA Information "EveryWear (EveryWear) - 07.19.1"

https://www.nasa.gov/mission_pages/station/research/experiments/2308.html

Berkeley News "Let them see you sweat: What new wearable sensors can reveal from perspiration" <http://news.berkeley.edu/2016/01/27/wearable-sweat-sensors/>

Larry Hardesty, MIT News Office, June 22, 2015

<http://news.mit.edu/2015/solar-powered-sensors-0623>

CityTronics "Live Smart", NASA Challenge 2017, Henry Cabarcas Salcedo, Daniela Uribe, Sebastián Lozano.

<https://2017.spaceappschallenge.org/challenges/earth-and-us/live-smart/teams/citytronics/project>

Autodesk Inventor Professional 2017 "Autodesk Inventor 3D CAD software is used for product design, rendering, and simulation."

Synopsis

One problem explorers face in Mars, is not having control of the energy they waste and the lack of knowledge they have of the meteorological changes in the planet. Our idea is a group of sensors to help them control and understand these variables.