STRATOS telemetry data: now you see it !

Stratos: the Canadian Space Agency Stratospheric Balloon Program
(Image Credit: CSA)

THE CHALLENGE:

Create a web-based dashboard tool that will allow scientists, but also the general public, to easily consult, visualize and/or interpret the telemetry data and images captured from stratospheric balloon flights during the Austral 2017 and Strato-Science 2018 campaigns.

Access the data subset here : ftp://ftp.asc-csa.gc.ca/users/OpenData_DonneesOuvertes/pub/Space%20Apps%20Challenge%202019/STRATOS/

THE ISSUE

During the stratospheric balloon flights, the CSA captures a variety of data (altitude; speed; air pressure; temperature; etc.) and images that is of great value to the scientists involved in the STRATOS campaigns and to the general public. This data is freely disseminated and accessible to all. Help CSA facilitate access to this data with web tool that will shred the light on the stratosphere.

THE NEED

<u>An intuitive visualisation platform</u>

CSA needs a web tool (API type) combining the telemetry data and images collected during the stratospheric balloon flight making them easy and intuitive to view/consult for scientists, the general public, kids, etc.

Potential output

A tool grouping the images and telemetry data into a single easy-to-use platform. Here are possible ways to develop your solution.

- Creation of a web-based (API-type) tool that gathers telemetric data and makes it easy and intuitive to view/view.

    o Develop different modes of visualization to target the different audiences of the Canadian Space Agency: scientists; citizens in general; children and youth; etc.

* The solution doesn't need to be an elaborate one. Your work could only consist in a "concept of solution" like a basic code that would run based on a few images/ lines of data.

How to get started

Consult the pictures taken during the balloon flight, find the concurring telemetric data and figure out how to improve the consultation of both of them together.

To help you develop the solution to this challenge, we identified the periods during which the data collection was particularly interesting, either in relation to the type of image captured, or in connection with the movement/ trajectory of the balloon (refer to provided data subset). You can use this data in whole or in part to propose a solution to the challenge. You can also explore the rest of the data set and identify yourself which ones you decide to use.

Example of interesting images/data:

Figure 1: images 464 (2018 data set) showing horizon & 113 (2017) showing the Australian desert as seen from the stratosphere. How cold was it, what was the altitude, etc.? Come up with a dynamic and playful way to visualize telemetric data associated to pictures taken during the flight.

BACKGROUND

In 2013, the Canadian Space Agency (CSA) launched the STRATOS stratospheric balloon program. This program provides Canadian universities and companies with the opportunity to test and validate new technologies and conduct scientific experiments in a quasi-space environment.

Stratospheric balloons are aerostats that can be sent into the stratosphere. These are the only aircraft that can be used in this region of the atmosphere (approximately 15 to 45 km above sea level). The stratosphere is too low for satellites, too high for aircraft and rockets pass through it too fast. The CSA uses stratospheric balloons to test and validate new technologies designed for long-term space missions and to conduct scientific experiments in a quasi-space environment.

In addition to experiments conducted by Canadian universities and businesses using data captured by payloads attached to the balloon, the Canadian Space Agency captures in-flight images and compiles telemetry data (altitude; speed; atmospheric pressure; temperature; etc.) related to balloon movement. Since this variety of data is of great value to the scientists involved in the STRATOS campaigns and to the general public, it is open and accessible to all. Propose a solution that will facilitate the consultation of this information and highlight the data on the stratospheric environment.

Other relevant information and data sets

Workshop by CSA's Expert

Technical information on STRATOS campaigns

Austral 2017 campaign and datasets