

The slide is decorated with various dango (Japanese dumplings) on sticks. In the top left, there is a skewer with four white dango and one below it with a green, a white, and a pink dango. At the top center is a black dango. In the top right is a green dango. In the bottom left is a brown dango. In the bottom right is a pink dango. The central focus is a large skewer with three white dango, with the text 'DangoSat project' overlaid on them.

DangoSat project

Development of an application for analyzing the best shelter in developing countries using satellite data and investigation of the best locating shelter by using CanSat

NASA
SPACE APPS
CHALLENGE
KUSHIMOTO

Team DangoSat

Our Mission Theme.

● In order to Establish shelters in developing countries

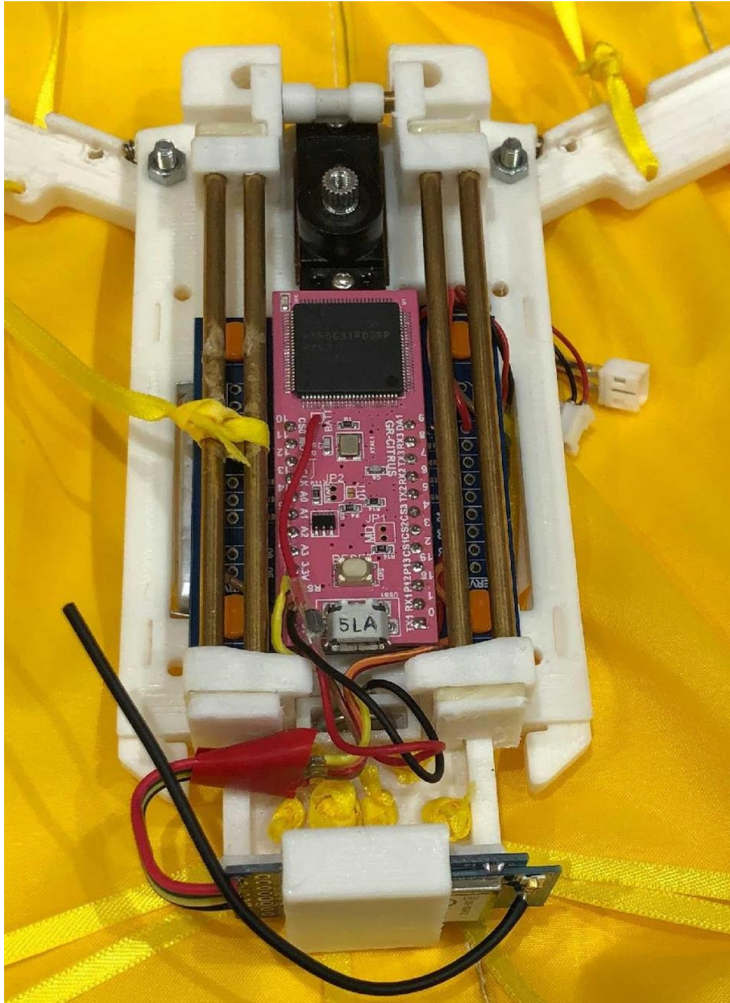
1. finding out where the appropriate place is with satellite data.
2. Investigate whether the place is truly suitable using CanSat.

Reasons why we use CanSat by launching model rocket.

- Developing countries are more likely to have poorly maintained roads.
 - It's not an easy place to get into.
 - Approach it from above.
- It is economical to use model rockets
 - It's cheaper to survey poor developing countries than using drones and other devices to drop CanSats in poor developing countries.

That is why we adopt CanSat by launching model rockets

CanSat for optimal evacuation site identification



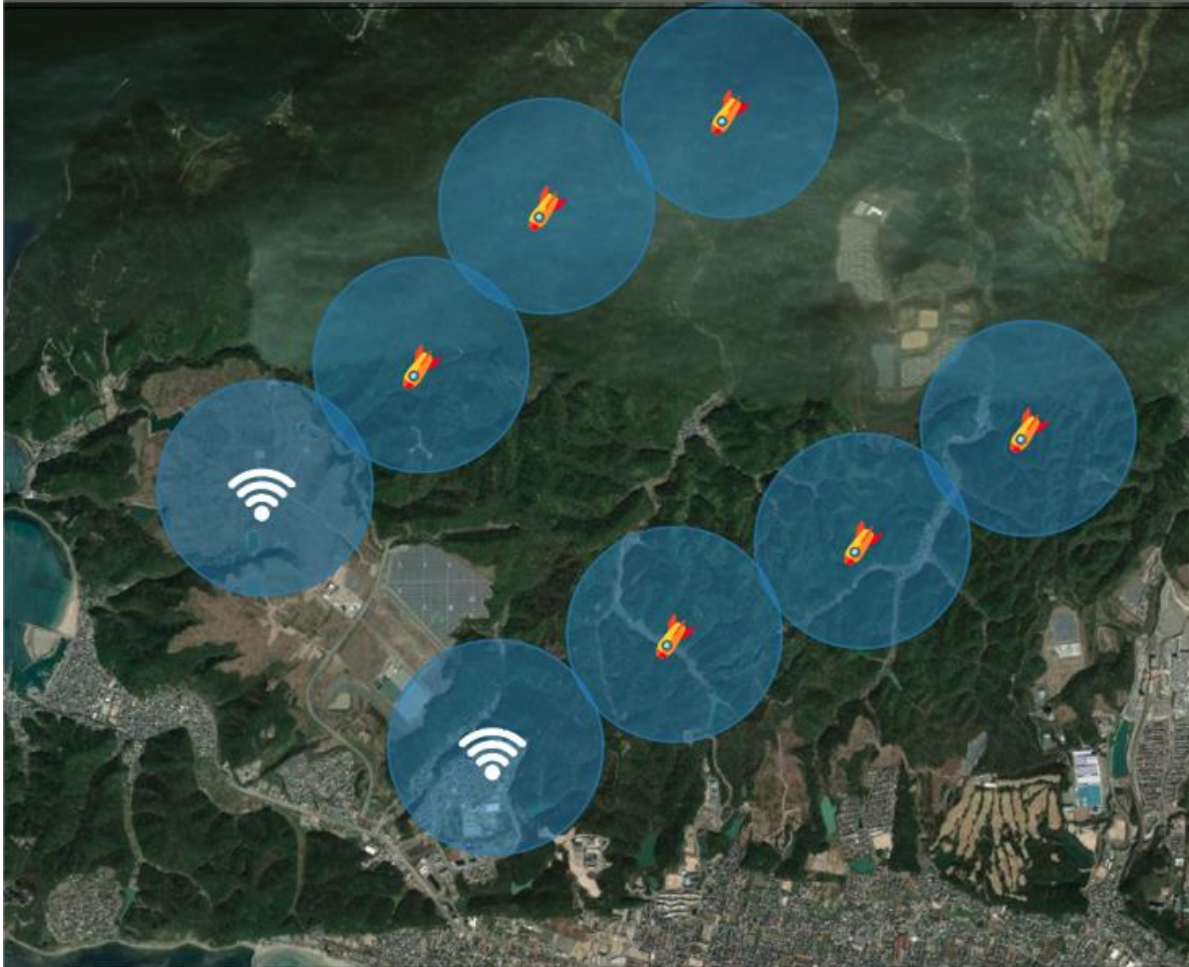
We named this original CanSat DangoSat.

- By using LoRa network

- Get latitude, longitude, temperature, humidity and illumination

- Determine from the data whether it is appropriate for a shelter

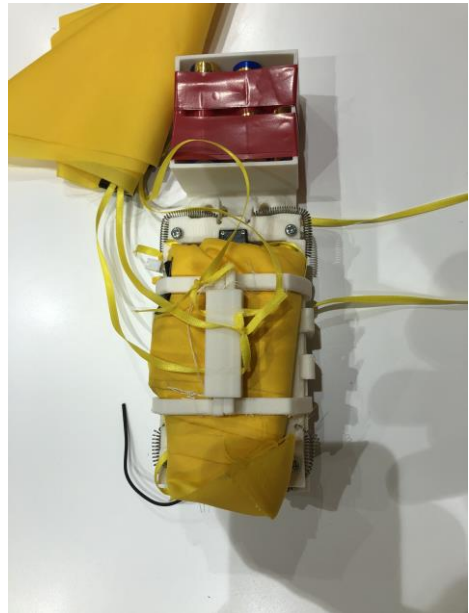
LoRa networking to judge the appropriate site



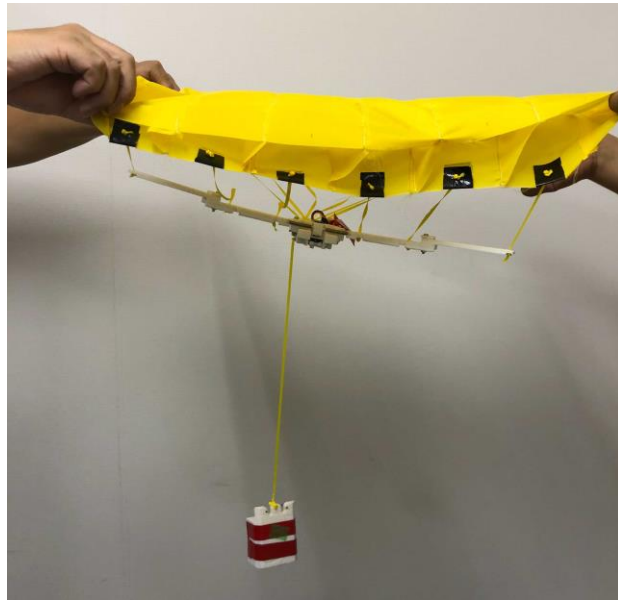
- Pre-arranged list of places to drop with satellite images
- Probability of the network with LoRa repeaters
- Enable sensor data to be sent and received by LoRa networking

→examine them in detail

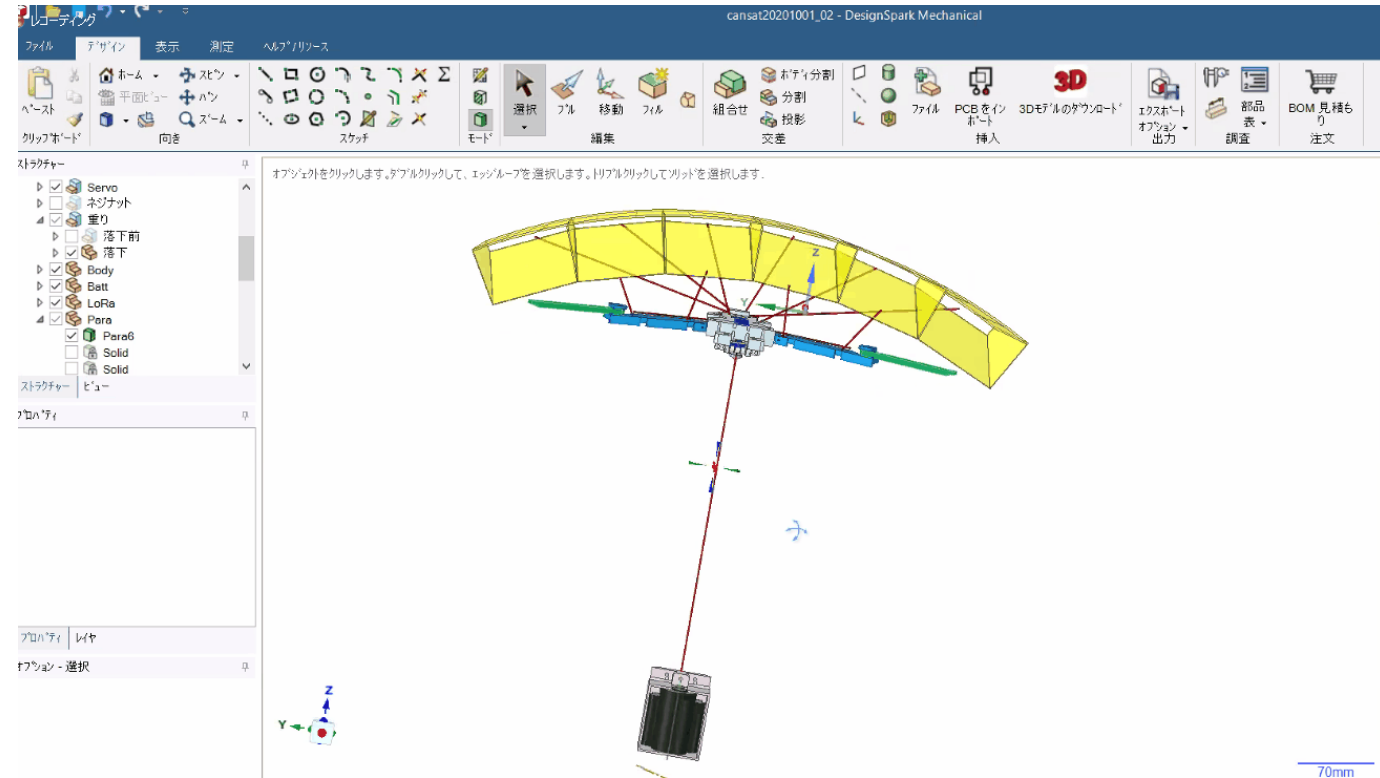
LoRa repeater CanSat



time of storage
in the rocket



time of deployment



CAD

● We developed glider parachute that is controlled and can reach the destination.

All of the CanSat and parachute were designed by CAD, and we actually developed it.

Rockets development with local people.

The model rockets we made this time is made of paper and wood.



9/18, 19



10/4



10/4

● Even people who have no specific skill could develop rocket. This rocket could be launched perfectly..

Describe how your project addresses this challenge

What did you develop? Why is it important? What does it do? How does it work? What do you hope to achieve?

The damage caused by natural disasters is concentrated in poor countries. This is due to unpreparedness and lack of proper information and knowledge about disasters. As a tendency, while the rich have access to this information, the poor do not. In order to fill this gap, we gather data and build the wireless network by launching the CanSat and model-rockets.

自然災害がもたらす被害は貧しい国々に集中しているという現状がある。この理由は、災害に対する事前の準備ができておらず、災害に対する適切な情報や知識に欠けているためである。富裕層はこれらの情報を得られることができる一方で貧しい人々はこれらの情報を得られていない現状がある。このギャップを埋めるために、誰でもアクセスが可能な避難情報を得られるシステムを構築した。この構築を確立するために、私たちは衛星データのみならずモデルロケットや缶サットを用いてどのようにシステムが機能するか実証して確かめた。

Describe how you developed your project

What inspired your team to choose this challenge? What was your approach to developing this project? What tools, coding languages, hardware, software did you use to develop your project? What problems and achievements did your team have?

We use satellite data to point out the locations to build effective wireless network. Also, We use LoRa and CanSat and cheap cost model rocket to build the wireless network to achieve this goal.

詳細な土地データが存在しない地域から、安全に避難できる場所と、その場所のデータを最適に伝達できるネットワーク網が作成できるリピータ設置ポイントを衛星データを用いて解析し、これらを誰もが簡単に安価に制作できるモデルロケットの技術、安価なCanSatの作成技術、長距離省電力な通信が可能なLoRa無線を用いて、実現した。

How did you use space agency data in your project?

A list of potential shelter sites is compiled in advance and satellite images and other data are used to select the locations that will penetrate the CanSat.

We find locations where suitable for shelters by using the image of Landsat-8. Also, we launched the CanSat by DIY model rocket to get more detailed data. Also, we equipped the LoRa to the CanSat to build wireless network that connected to internet to send the collected data.

ランドサットの画像データから避難所に最適な場所を検索した。さらに、その場所が本当に避難場所として最適かどうかを判断するために、自作缶サットをその地点に落とし、そこで収集されるデータをインターネット環境が得られる場所まで誘導できるのLoRa無線リピータを配置する最適な場所も検索した。

あらかじめ避難所の候補地をリストアップして、缶サットを着地する場所を選択するために、衛星画像等のデータを使用します。

Use the satellite images to create the list of potential shelter sites, and to select a place to land the can sats.

List of potential shelter sites and use data such as satellite images to select a place to land the can sats.

(6ページ目スライド)

グライダーパラシュートを制御して、目的の場所に着地し、LoRaリピーターとして機能するCan Sat「DangoSat」を自作した。
これは、腕を折りたたんでロケットのペイロードに収納し、放出とともに腕を展開して折りたたんだグライダーパラシュートを広げて目的の場所まで滑空する。

References: List the data and resources used in your project

https://api.nasa.gov/planetary/earth/imagery?lon=100.75&lat=1.5&date=2014-02-01&api_key=DEMO_KEY

使用データのURL

https://www.nasa.gov/mission_pages/landsat/main/