S1-Vis Tool: Radar for Everyone

An interactive Earth Engine App for radar-based information extraction for non-experts

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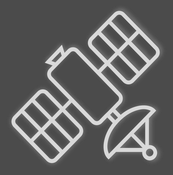
PROJECT IDEA

The last 10 to 15 years have seen an increasing use of geospatial technologies and EO data in operations of humanitarian NGO´s. The majority of data used is optical satellite imagery while the advantages of radar imagery is vastly underexploited. Especially cloud penetration and nighttime acquisition are attributes that make radar a valuable complementary data source.
However, as radar image analysis and interpretation is not as intuitive as for optical data, applications that lower the barrier for non-experts are necessary tools.
Therefore, in this project a **Google Earth Engine App** was developed that allows the user to interactively explore radar data and retrieve information from it.

DATA

Sentinel-1

- Ground Range Detected
- C-Band, log-scaling
- Data Availability (in Catalog):
  - 03.10.2014 – Yesterday
- 10 m pixel resolution

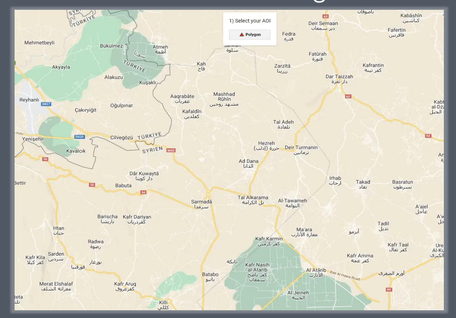


Sentinel-2

- Surface Reflectance
- Data Availability (in Catalog):
  - 28.03.2017 – Yesterday
- 13 spectral bands (RGB used)
- 10 m spatial resolution

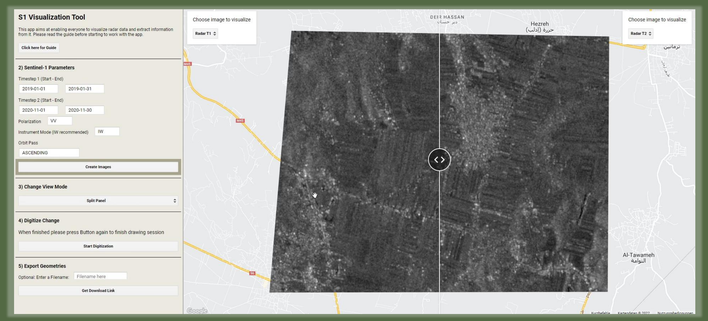
PROCESS FLOW

1. AOI Drawing

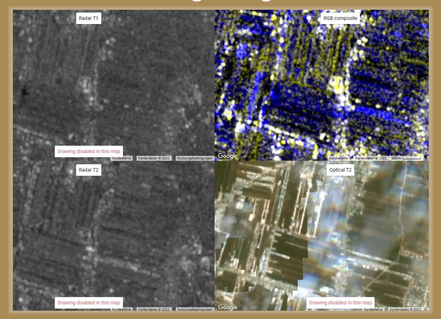


2. Parameter Setting

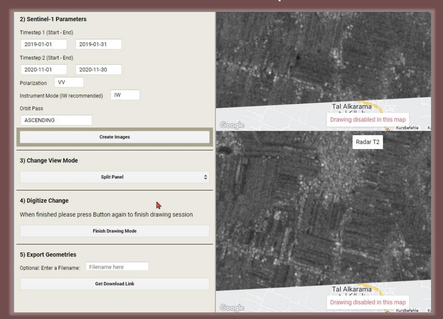
3. View Modes



4. Change Digitization



5. Data Export



COMPONENTS

- Setup
  - AOI Drawing
  - Parameter Setting
- View Modes
  - Split Panel
  - Linked Maps
- Visualization Techniques
  - false color composites
- Digitization
  - user-drawn polygons
- Data Export
  - GeoJson file

OUTLOOK

A Application Cases

Although the app was built around the application case of dwelling detection, many other use cases come to mind such as flood mask extraction.

B Adaptive UI Design

With adding functionalities, the UI needs to be adapted for better intuitive handling by the user. Presentation of functions through the UI needs to be adaptive to the changes the user makes.

C Error Resistance

Adding more precise feedback and security checks, e.g., in the form of parameter validation to prevent unexpected behavior or crashes of the app.

References

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Voigt, S., Giulio-Tonolo, F., Lyons, J., Kučera, J., Jones, B., Schneiderhan, T., Platzeck, G., Kaku, K., Hazarika, M. K., Czaran, L., Li, S., Pedersen, W., James, G. K., Proy, C., Muthike, D. M., Bequignon, J., & Guha-Sapir, D. (2016). Global trends in satellite-based emergency mapping. Science, 353(6296), 247–252.

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App Access

SCAN ME