Google Earth Engine Introduction

Google Earth Engine is a cloud-based platform that provides access to an extensive catalog of remote sensing data for planetary-scale analysis. In this QuickStart, we will cover the basic steps to get started with Google Earth Engine using the provided sources.

To begin with, you must create an account on Google Earth Engine's website. The platform is free to use for research, education, or nonprofit use, and you can register for an account https://earthengine.google.com/signup).

The Google Earth Engine Explorer is a powerful tool that allows you to search through vast quantities of satellite imagery. There are two main sections in the GEE Explorer: the Data Catalog and the Workspace. The Data Catalog gives you the familiar search interface that you are accustomed to through Google. You can either search by place or keyword. For example, if you want to find Sentinel data, just type it into the search bar. All of the available products will pop up in your search results. Simply, click the item for more information. If you want to add it to GEE Explorer, then click the button “Import”. The Workspace allows users to analyze and visualize any datasets from the Data Catalog in a browser. GEE Explorer also supports projections on the fly so you don’t have to work about projecting your data.

Once you have set up your account, you can open the Earth Engine Code Editor https://code.earthengine.google.com/ . The Code Editor is a web-based integrated development environment for Earth Engine. It provides a platform for running and testing Earth Engine in JavaScript code. The Code Editor is composed of several panels, including the Script panel, the Console panel, and the Map panel. The Script panel is where you write your JavaScript code, the Console panel is where you can see the output of your code and run commands, and the Map panel is where you can visualize the results of your code.

Google Earth Engine contains more than 1000 data types and operators to help lay a solid foundation for any type of remote sensing analysis. Here are some of the basic tools that you can perform analysis within Google Earth Explorer:

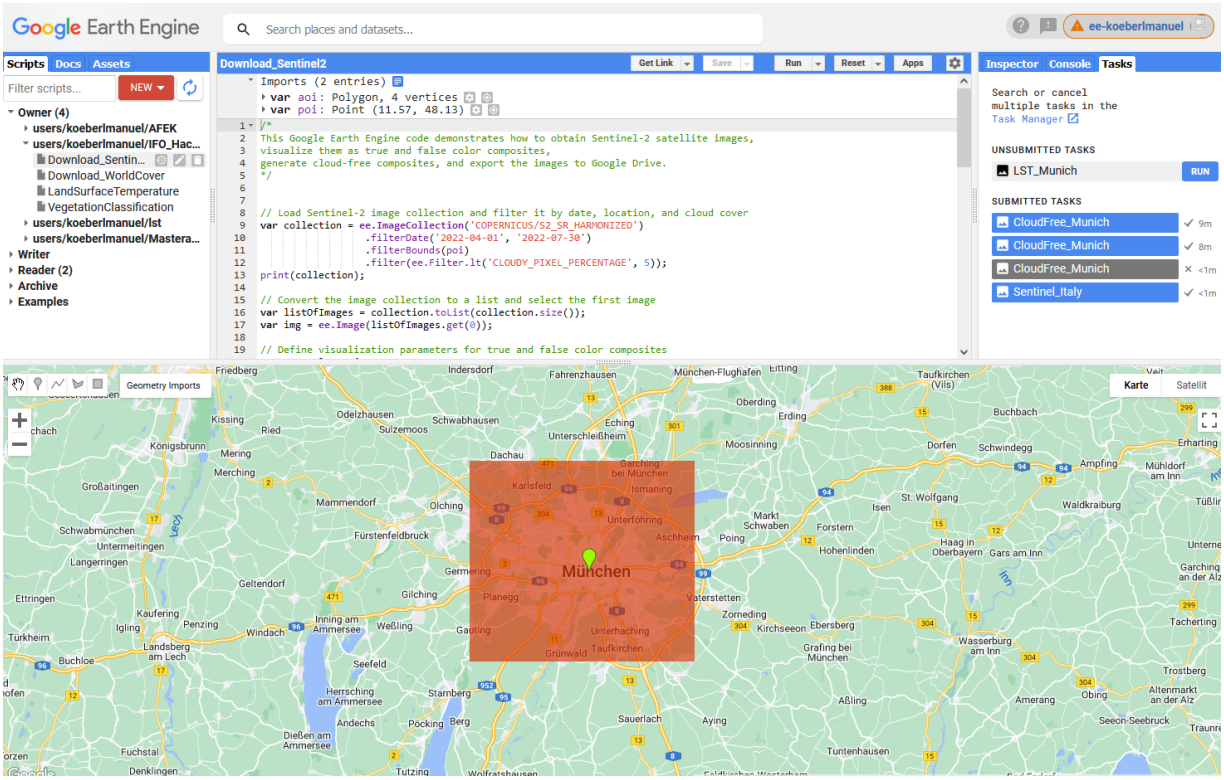
- ee.Image() - represents a single image in Earth Engine
- ee.ImageCollection() - represents a collection of images in Earth Engine
- ee.Geometry() - represents a geometric object in Earth Engine, such as a point, line, or polygon
- ee.Feature() - represents a geographic feature in Earth Engine, such as a building, road, or river
- ee.FeatureCollection() - represents a collection of features in Earth Engine
- ee.Reducer() - computes a summary statistic for a given region, such as mean or standard deviation.

In addition to these analysis tools, there are other specialty types of algorithms. One of the most exciting areas of development in GEE is a shift to machine learning algorithms and deep neural networks. Specifically, here are some of the machine learning tools available:

- ee.Classifier() - a machine learning algorithm that classifies pixels in an image
- ee.Clusterer() - a machine learning algorithm that clusters pixels in an image
- ee.Image.train

Please feel free to look through the many provided tutorials from Google (https://developers.google.com/earth-engine/tutorials/tutorials) or look at some simple scripts in this repository: https://code.earthengine.google.com/?accept_repo=users/koeberlmanuel/IFO_Hackathon.

After you followed this link please make sure that you refresh your own repository!



The online code editor has an intuitive front end. You can search for data and places in the search box in the top of the window. On the left side you can manage your scripts and imported repositories. In the middle you can write your code. At the bottom you have an interactive map window. You can draw polygons or set markers, which get automatically imported into your editor. Please note that on the right side you also have relevant panels. With the Inspector you can inspect single pixel values of a satellite image for example. In the console you see error messages and the output of print commands. **Important: if you want to export an image you have to manually run the corresponding task in the "Tasks" panel!** After a couple of minutes (depending on the size of the image) it will appear in your GoogleDrive.