



Australian Space Data
Analysis Facility

EO
Data Science



Introduction to Python and Earth Observation Data Using Google Earth Engine

Contacts:

Mortaza Rezae (Coordinator)
mortaza.rezae@curtin.edu.au

Jonathan Neo (Instructor);

**Rory Donnelly – EO Data
Science (Instructor);**

**Ammar Mahmood – EO Data
Science (Instructor);**

**Yvonne Fong – EO Data
Science (Instructor);**

Where:

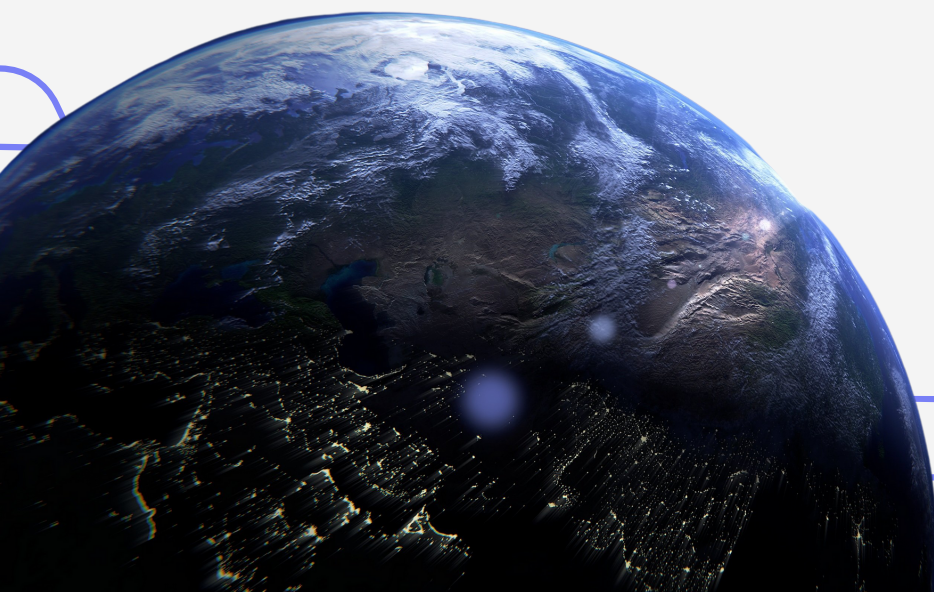
Curtin University

When:

31-August -3 September

Time:

5:30PM -9:30PM



BootCamp Description

This four-day bootcamp will teach you the tools and techniques for analysing and using earth observation data. In particular, this bootcamp will provide an introduction to the Python programming language, the Pandas library, and the Plotly visualisation tool. It will also provide you with a foundational understanding of Google Earth Engine, its capabilities, and how Earth Engine can be used to deliver insights and outputs. After completing this bootcamp, attendees will have a solid understanding of Python and Earth Engine, as well as the skills to use these tools effectively to perform computations on earth observation data.

Objectives

- Introduction to Google Colab and Python (variables, conditional, loops, functions, dictionaries)
- Introduction to scientific Python: Pandas and plotly.
- Google Earth Engine overview (code editor, scripting overview, assets overview, tasks overview)
- Earth observation data analysis using Earth Engine (images and image collections, features and feature collections, filtering, reducers, raster algebra, iterating, visualisation, geospatial algorithms)

Before the bootcamp...

To attend this bootcamp, you will need:

- A computer with a relatively recent internet browser installed;
- To have register to use Earth Engine at least three days before the bootcamp - signup.earthengine.google.com

Day 1

Introduction to Python

- 5:30pm** Setting up Google Colab
- 6:00pm** Intro to Python
Python variables and manipulating variables
Python conditionals
- 7:15pm** Dinner break
- 7:45pm** Intro to Python continued
For Loops
While loops
Advanced loops
Python functions
- 9:30pm** *End*

Day 2

Data analysis and visualisation with Python

- 5:30pm** Intermediate Python
Dictionaries
Modules
- 6:35pm** Pandas
Pandas dataframe
Manipulating data
Handling missing values
- 7:20pm** Dinner break
- 7:50pm** Plotly
Visualisation using Plotly
Working with geo data
Mapbox
- 9:30pm** *End*

Day 3

Google Earth Engine Overview

- 5:30pm** GIS Concepts
Earth Engine Overview
Client vs Server
Javascript vs Python APIs
Earth Engine objects
Data types (image, feature, collections)
Earth Engine coding best practices
- 7:20pm** Dinner break
- 7:50pm** Earth Engine Python API and geemap
Creating interactive maps
Loading Earth Engine datasets
Filtering
Reducing
Data visualisation
- 9:30pm** *End*

Day 4

EO Data Analysis Using Google Earth Engine

- 5:30pm** Supervised classification:
Create training dataset
Train classifier
Classify image
Visualise result
Export result
- 7:20pm** Dinner break
- 7:50pm** Unsupervised classification
Train clusterer
Classify image
Label clusters
Visualise result
Export result
- 9:30pm** *End*