## Module 01

### Sensing Day 01 / Building a Datalogger

Arduino: Building the datalogger

### Sensing Day 02 / Visualising the results of the datalogger

vvvv: the language, skia and stride

vvvv: Live link to Arduino

vvvv: Visualisation of Arduino csv in grasshopper and vvvv

Grasshopper: live link to Arduino

Grasshopper: visualisation of Arduino csv

### Sensing Day 03 / Participatory Event

Participatory Event

## Module 02

### Mining Day 01 / Open data

#### Prerequisites:

Install Qgis

Obtain a Flickr API key from [here](https://www.flickr.com/services/api/misc.api_keys.html)

Open a mapbox account

Open a Food4Rhino Account

Download Elk 2.2.2 from [Food4Rhino](https://www.food4rhino.com/en/app/elk)

Open an account with [Earth Explorer](http://earthexplorer.usgs.gov/)

Download Mosquito from food4rhino or from [here](https://www.synthetic.space/synthetic/2443/)

#### Shapefiles: Download noise data from the London Datastore and display & style QGis

Exercise 01

Explain London Datastore, Shapefiles and why we are looking at QGis

Download the noise file, look at the structure of the file and open it in QGis, add OSM Background Map

Explain different [CRS](https://8thlight.com/insights/geographic-coordinate-systems-101#:~:text=The%20three%20most%20common%20systems,the%20surface%20of%20the%20earth.)

Explain the basic principle of QGis ( Interface, Import formats, Links, Tables)

Style the layer

Ho to do an A3 Layout and Export it as .pdf

#### Shapefiles: Open London Map

Exercise 02

#### Plug Ins: Extract data from OpenStreetMap in Qgis

Exercise 03

Explain how OSM works

Install plug in – Quick OSM / Show how to download data partially

Show Geofabric – Download London Map

#### Plug Ins: Download Flickr Images in QGIS

Exercise 04

Download the plug in from the QGis Online [repository](https://plugins.qgis.org/plugins/flickrdl/) or from the Plug-In Manager

#### Mapbox and background maps QGIS and export

[Link](https://docs.mapbox.com/help/tutorials/mapbox-arcgis-qgis/#add-mapbox-maps-in-qgis)

#### Rhino/Grasshopper:

Shapefiles in Rhino

Exercise 05

Elk

Exercise 06

Mosquito

Exercise 07

Kepler GL

Exercise 08

#### Arduino list

### Mining Day 02 / Methods of Datamining in Python 01: Python & Rest API’s

#### Prerequisites

Google Account for Colab

#### Python – Work with text files

How to import text files

How to import google sheets files

How to export to csv and how to export to google sheets

Exercise 01

#### Python – Work with Pandas

Create a dataframe from CSV

Get the main properties of a dataframe

Add and remove columns to a dataframe

Series

Perform operations on one

CSV to Dataframe

Python – Work with Graphs

Python – Work with Folium

Python – Modularise the code

Download data from TFL with Rest API

Tweets and Sentiment Analysis

### Mining Day 03 / Methods of Datamining in Python 02: Web scraping & Libraries

#### Prerequisites

Google developer account

Flickr developer account

#### Google API

#### Popular times Google

#### Flickr Search

#### Scraping – Extracting data from TripAdvisor

Tumblr & YouTube search

Snscrape

Pinterest

Facebook – Creating network graphs look into it

## Module 03

### Geometries Day 01 / Particles System

vvvv fuse 01: Particle systems

Grasshopper Culebra

### Geometries Day 01 / Image to 3D

Point clouds from images and videos

Images: Noise in vvvv

(Images: OpenCV in vvvv)

(Rest API’s in vvvv / Object recognition in Microsoft Cognitive Services)

Machine Learning in vvvv wekinator

Machine Learning in vvvv RunwayML

### Geometries Day 03 / SDF and VR

Import of geometries into vvvv

Materials in vvvv

vvvv fuse 02: SDF geometries

VR in vvvv