README.md

STFC FN+ COP26 Hackathon

Event Handbook

This handbook contains all the necessary information for participants of the event. If you have any queries about the materials provided or find a problem, please email stfcfoodnetwork@sheffield.ac.uk

1. The Challenge

Through our partnerships with UKRI STFC, STFC Hartree Centre, IBM Research, and theCentre for Sustainable Agriculture we have identified a need to provide smallholder farmers with timely and location-specific advice about the crop types and varieties they should grow. Our challenge for the hackathon is to bring together hugely varied datasets - from market price data to soil maps - to design an integrated open access platform for recommending crop type, planting date and management advice for smallholder farmers in India.

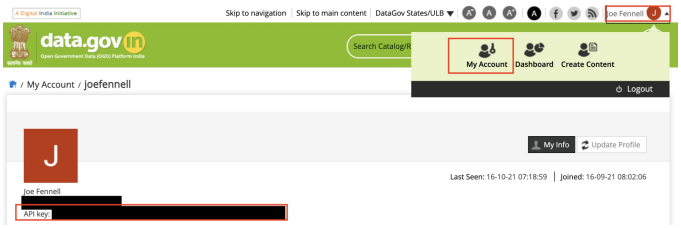
2. Pre-event activities

2.1. Register with Open Government Data Platform India

This data service is part of the Indian Open Government Data initiative and provides a large number of datasets across multiple sectors. It is important to register for an account as you will need an API Key to access the database.

Click Here To Register

2.2. Check you can access your API key



2.3. Get a Google Account and register for Google Earth Engine [optional]

Google Earth Engine allows you to access and process different geospatial datasets. The service is free with a limit on the amount of processing you can request.

Click Here To Register

3. Participation and Agenda

Firstly, please read the code of conduct and the terms and conditions of entry. By participating in this event, you agree to adhere to the behaviour code and the terms and conditions.

Secondly, please make a note of the times of the two mandatory sessions: 10:00 - 11:00 GMT on Tuesday 2nd November and 14:15 - 16:15 GMT on Friday 5th November.

Tuesday 2nd November		
10:00-10:30 GMT	Welcome and Introduction	Professor Sonal Choudhury
10:30-11:00 GMT	Q&A: Technical/Practical Advice	Dr Joe Fennell
Friday 5th November		
14:00 GMT	Deadline for slide submission	send to stfcfoodnetwork@sheffield.ac.uk
14:15-15:30 GMT	Team pitch	
15:30-16:00 GMT	Judging (offline)	
16:00 - 16:15 GMT	Award	

4. Your pitch

Your team will produce a 10 minute pitch that showcases your idea and present this in the session on Friday. The format is up to you, but remember this is a pitch for funding, so you need to present a coherent argument for why and how your app will support the objectives of the project.

It could include :

- User Stories Descriptions of why and how your users will interact with the platform
- Results from the data experiments you carry out during the hackathon
- How the app will work This could include a description of analysis strategies
- Visualisations This could be example interfaces shown as mock-ups, wireframes or prototype demonstrations
- Management How your team will use the investment to produce the platform. How will you keep it running?

You must submit your slides by 14:00 GMT on Friday 5th of November (email slides or a link to stfcfoodnetwork@sheffield.ac.uk). Slides submitted later than this will not be accepted, but you will still be able to pitch (without slides).

Alternatively, you are welcome to submit a video presentation of no more than 10 minutes by the slide deadline. This should be hosted on Youtube or Vimeo and cannot be edited after the deadline. Please email the link as above.

5. Recommended Datasets

We have included data gathered by project partners as well as relevant 3rd party geospatial data providers.

5.1. Farm survey data

This is a 4 year farm survey with the yield and crop type along with incomplete spatial information. The dataset is included in this repository at `data/sample_data_gov_in.csv`

Field	Description	dtype
Year	Year of survey	int
Farmer Tracenet code	unique farmer code	str
Village	Village of farm	str
District	District of farm	str
State	State of farm	str
Latitude	Latitude of farm. Although may not be exact	float
Longitude	Longitude of farm (May not be exact)	float
Crops	Crop type	str
Area (HA)	Area of that crop type	float
Estimated yield	Weight of crop in metric tonnes	float

5.2. Market data from Indian Government

The data.gov.in website has over 300,000 datasets. Part of this hackathon is about exploring the breadth and quality of these data. The most relevant section is probably the agricultural markets section.

An example dataset is the Daily Market Prices of Garlic across India. The holding page is here: https://data.gov.in/resources/variety-wise-daily-market-prices-garlic-2021/api displaying the resource ID.

You can then make an API request over https to download a CSV. e.g.

https://api.data.gov.in/resource/af4ed290-ed4f-40e1-a8b8-a4440e57a9ed?api-key=579b464db66ec23bdd000001cdd3946e44ce4aad7209ff7b23ac571b&format=csv&offset=0

> Note that the `api-key` has been set to a test key that limits the number of records to 10. You can replace this with the key in your user space (see section 2.2).

The response from this request is located in `data/sample_data_gov_in.csv`

There is a pip-installable package called `datagovindia` that offers a Python interface to the data service: visit project pages. We have not tested this. Another option would be using the Requests library in Python to help you parse requests to the web service.

5.3. Soil Data

Your project may require soils data. One source is Soil Grids who provide a Web Mapping Service for various soil parameters. This is gridded at different spatial resolutions, but typically 250m.

You can access this in many different ways. One option would be the OWSLib Python interface.

5.4. Google Earth Engine

Earth Engine is a tool giving access to many freely-available Remote Sensing datasets and allowing on-the-fly processing for various analyses. It can be accessed via the Code Editor GUI

Google Earth Engine Code Editor

Alternatively it can be accessed via the Python API. An introduction Jupyter Notebook to this can be found here that demonstrates how to authenticate and access Google Earth Engine resources.

5.5. Fertiliser, Pesticides and Disease Data

A set of 7 CSV files have been previously generated by project partners for combining different agronomic datasets. These are located in `data/agronomic/` .

A PDF document has also been supplied containing yield-fertiliser relationships for a number of different crops. This is located at `data/agronomic/eKrishi-Ferilizer Recommendation - yield equations.pdf`

5.6 Other Information Sources

Link	Type
Seednet	Crop groups and crops based on seednet
Crop Nutrition	Soil pH information
Natural Resource Conservation Service	Soil bulk density Information
FAO	Soil Classifications
AgroMonitoring	Alternative service for remotely-sensed imagery and weather data (polygon API)
Weather Stack	weather data
AccuWeather	weather data
Indian Weather Service	weather forecast data
Krishi	Agricultural study/monitoring data
Moqups	Wireframe and prototyping tools