**Turing Research Fellowship**

- 3 years (starting April 2023):
    - 1st yr: at the Turing
    - 2nd and 3rd yr: two placements

- time allocation:
    - 80% on a programme (Science of Cities and Regions)
    - 20% independent research

- mentor: Sarah Wise (UCL)

# Background

## Background

## Research question

How can tools best use AI to detect and facilitate effective disaster response?

# My *project*

Missing Maps

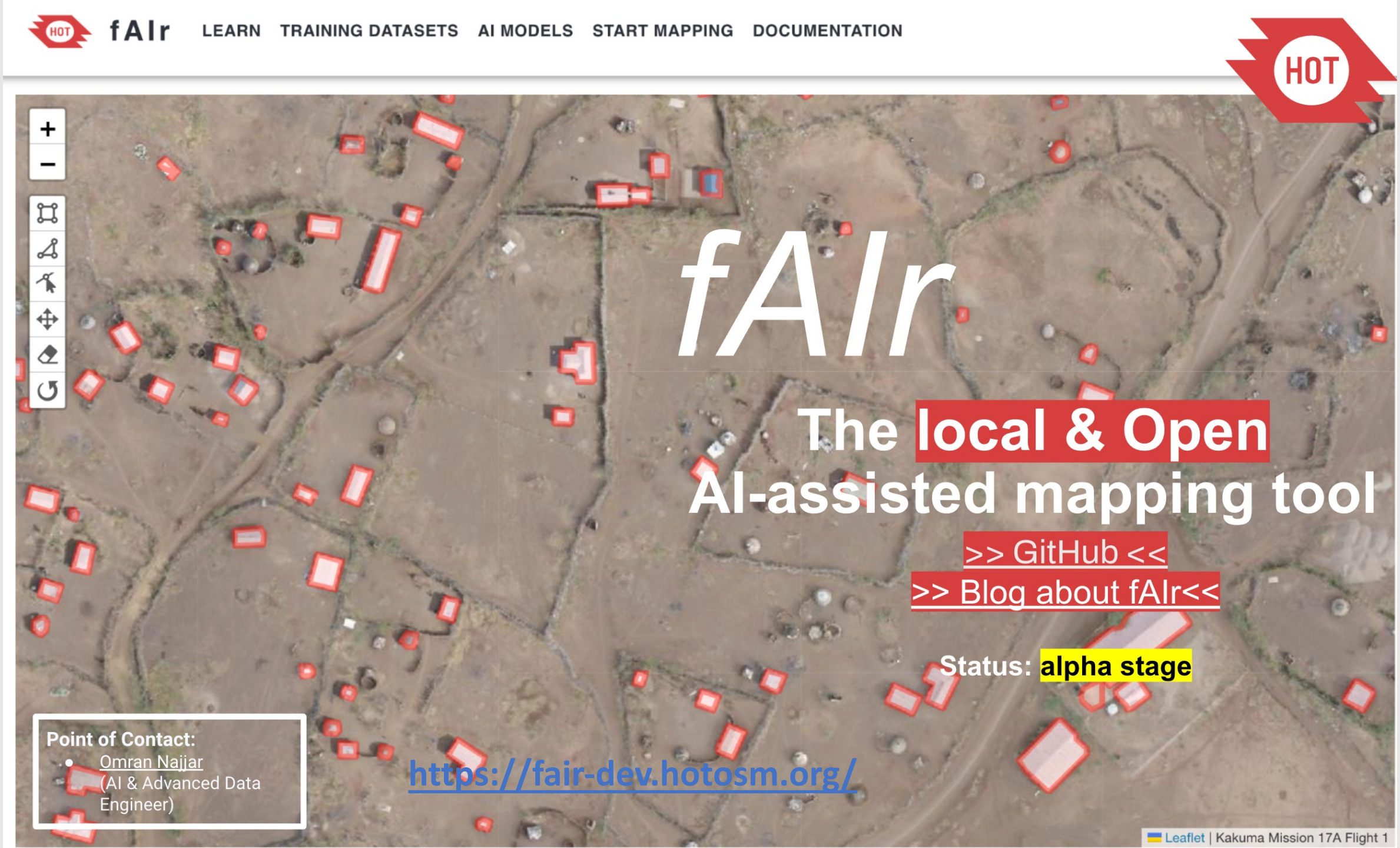
BritishRedCross

MEDECINS SANS FRONTIERES
DOCTORS WITHOUT BORDERS

MAP ACTION

HOT Humanitarian OpenStreetMap Team

https://docs.google.com/spreadsheets/d/1gefrKkl7JwjKyoeMhXW69NeR1BqjaJoCmdIeWaC5VzE/edit#gid=2030519786


fAIr LEARN TRAINING DATASETS AI MODELS START MAPPING DOCUMENTATION
HOT
fAIr
The local & Open
AI-assisted mapping tool
>> GitHub <<
>> Blog about fAIr<<
Status: alpha stage
Point of Contact:
Omran Najjar
(AI & Advanced Data Engineer)
https://fair-dev.hotosm.org/
Leaflet | Kakuma Mission 17A Flight 1

# Why fAIr?

**Lack of AI Openness**

Today's AI services are **not fully free and open source.**

**Bias in Models**

Today's AI models are **not sensitive to the local nature** of each areas.

**Lack of Humans in the Loops**

**People are not fully in the loop** in today's AI models.

**Lack of AI capacity building**

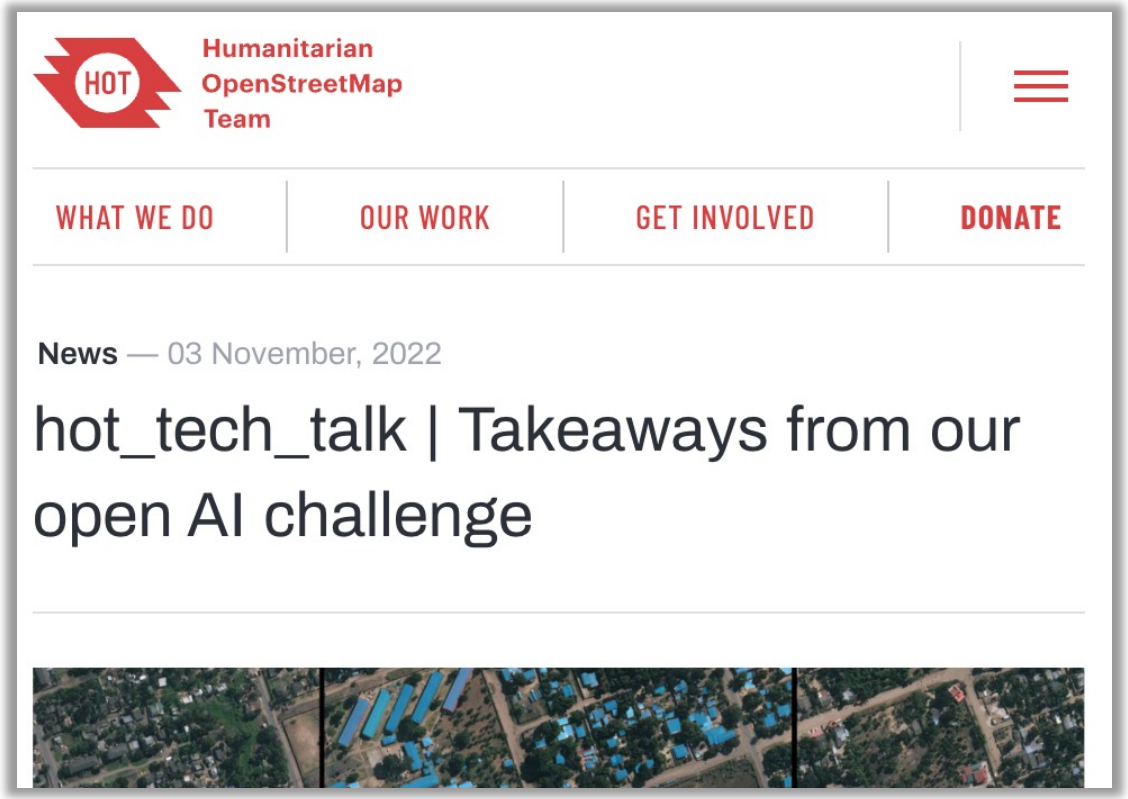
**People are not included** in the design and decision-making.

https://fair-dev.hotosm.org/

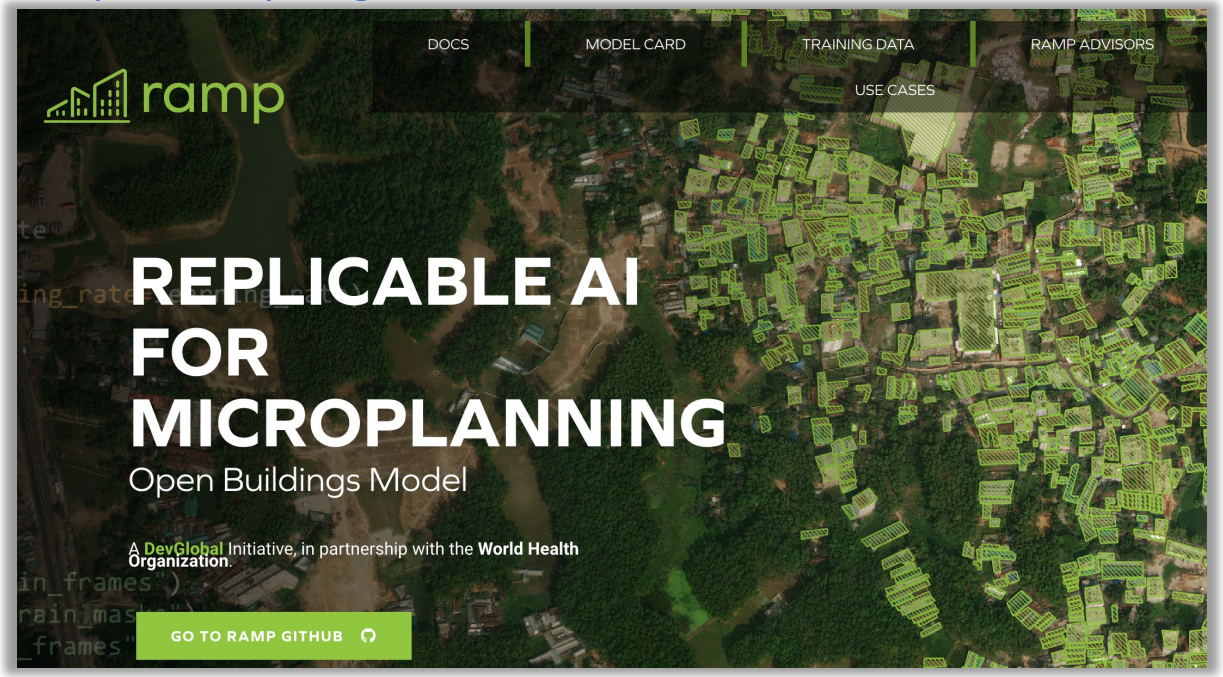
# State of the art

https://github.com/hotosm/fAIr-utilities

https://www.hotosm.org/tech-blog/hot-tech-talk-open-ai-challenge/




https://rampml.global/




https://drive.google.com/drive/folders/1PrNF_E96-k2B6Xr7jzymGG5fuxCYqe3s
HANDOVER from Omdena

## Idea

**Aim:** generate buildings footprint (OSM)

**How:**

1. **Improve existing fAIr-utilities:**
   - Another model (not ramp)
   - Rewrite the structure / folders (relatives in GitHub)
2. **Write “from scratch”**
   - Using PyTorch (currently TensorFlow)
   - adding remote sensing capabilities…?

# Challenges

Remote sensing?
CV models?

https://github.com/satellite-image-deep-learning/techniques

README.md

## 2. Segmentation


**(left) a satellite image and (right) the semantic classes in the image.**

Image segmentation is a crucial step in image analysis and computer vision, with the goal of dividing an image into semantically meaningful segments or regions. The process of image segmentation assigns a class label to each pixel in an image, effectively transforming an image from a 2D grid of pixels into a 2D grid of pixels with assigned class labels. One common application of image segmentation is road or building segmentation, where the goal is to identify and separate roads and buildings from other features within an image. To accomplish this task, single class models are often trained to differentiate between roads and background, or buildings and background. These models are designed to recognize specific features, such as color, texture, and shape, that are characteristic of roads or buildings, and use this information to assign class labels to the pixels in an image. Another common application of image segmentation is land use or crop type classification, where the goal is to identify and map different land cover types within an image. In this case, multi-class models are typically used to recognize and differentiate between multiple classes within an image, such as forests, urban areas, and agricultural land. These models are capable of recognizing complex relationships between different land cover types, allowing for a more comprehensive understanding of the image content. Read A brief introduction to satellite image segmentation with neural networks. **Note** that many articles which refer to 'hyperspectral land classification' are often actually describing semantic segmentation. Image source

### 2.1. Segmentation - Land use & land cover

2.1.1. U-Net for Semantic Segmentation on Unbalanced Aerial Imagery -> using the Dubai dataset `BEGINNER`

2.1.2. Semantic Segmentation of Dubai dataset Using a TensorFlow U-Net Model `BEGINNER`

2.1.3. nga-deep-learning -> performs semantic segmentation on high resultion GeoTIF data using a modified U-

Data availability?

https://wiki.openstreetmap.org/wiki/Maxar

**Legal permissions**

**Maxar Satellite EULA**: DigitalGlobe, Inc. is pleased to provide its high resolution satellite imagery to OpenStreetMap in support of its mapping initiatives. By using our imagery in the OSM editor, you understand and agree that you may only use our imagery to trace, and validate edits that must be contributed back to OSM. You cannot download our imagery or use our imagery for any other purpose. We retain all right, title and interest in and to our imagery. We provide our imagery "as is," with all faults and as available; we disclaim all warranties, express or implied, to the extent permitted by applicable law. You can recover from us only direct damages up

MAXAR

https://www.maxar.com/open-data

**OPEN DATA PROGRAM**

Maxar releases open data for select sudden onset major crisis events

https://openaerialmap.org/

OpenAerialMap  Explore imagery  Documentation  About  Blog

**The open collection of aerial imagery.**

OpenAerialMap is an open service to provide access to a commons of openly licensed imagery and map layer services. Download or contribute imagery to the growing commons of openly licensed imagery.

# testingML

Public

forked from bohaohuang/mrs

Pin | Watch 0 | Fork 14 | Star 0

master | 1 branch | 0 tags | Go to file | Add file | Code

This branch is 5 commits ahead, 292 commits behind bohaohuang:master. Contribute | Sync fork

**ciupava** Fixes issues with preprocess.py d57d6db 6 hours ago 5 commits

| | | |
|---|---|---|
| data | Fixes issues with preprocess.py | 6 hours ago |
| demo | first commit with local edits | last month |
| mrs_utils | first commit with local edits | last month |
| network | first commit with local edits | last month |
| .DS_Store | Fixes issues with preprocess.py | 6 hours ago |
| LICENSE | first commit with local edits | last month |
| README.md | first commit with local edits | last month |
| config.json | first commit with local edits | last month |
| config_mnih.json | local edits to try reproduce running mrs' code on mnih data | last month |
| config_ramp.json | local edits to try reproduce running mrs' code on mnih data | last month |
| environment.yml | first commit with local edits | last month |
| evaluate.py | first commit with local edits | last month |
| requirements.yml | first commit with local edits | last month |

## About

Forked from https://github.com/bohaohuang/mrs/tree/master *Models for Remote Sensing*; the aim is testing ML models for image segmentation to generate building footprints

machine-learning computer-vision openstreetmap building-footprints humanitarian-aid

Readme
MIT license
Activity
0 stars
0 watching
14 forks

## Releases

No releases published
Create a new release

## Packages