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DATA SCIENCE & ETHICS GROUP

How to use AI Ethically: An Introduction to the Decision Tree

28th May 2021

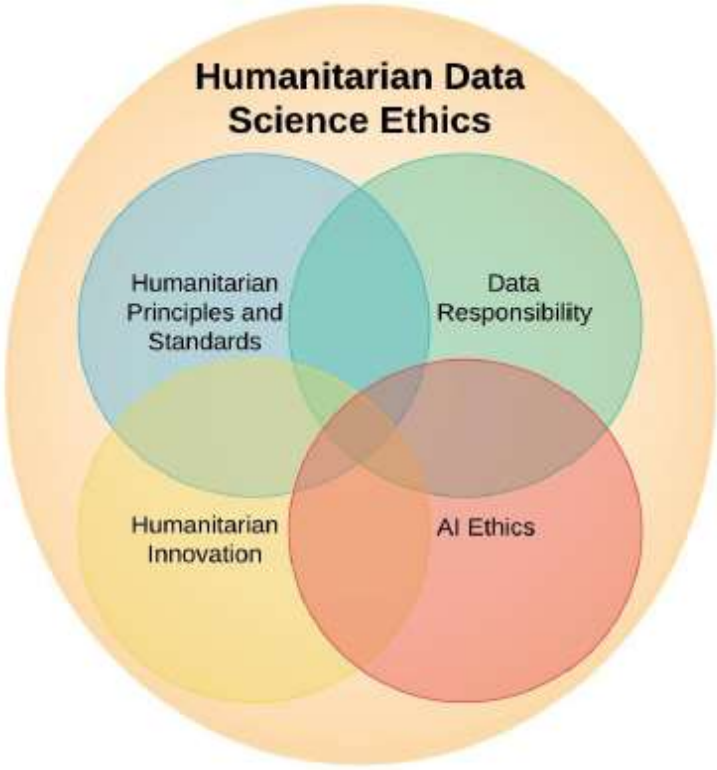
INTRODUCTION

The Humanitarian Data Science and Ethics Group ("DSEG"),

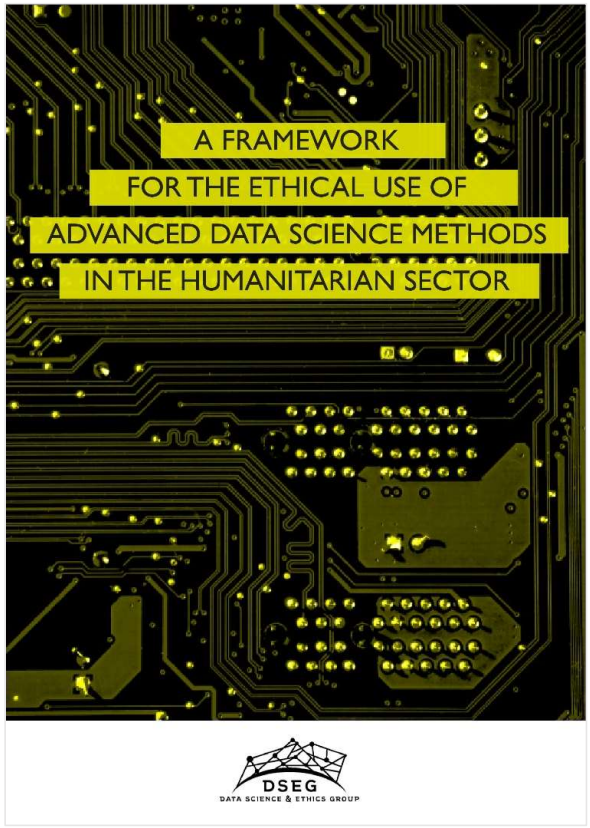
- Informally established in June 2018,
- Is a community of data scientists, humanitarians, academic researchers, and ethics advocates.

DSEG convenes diverse voices aiming to create a multi-disciplinary understanding of the ethical issues arising from humanitarian data discussions.

Discussions are at the juncture between principles and practice for the following areas:



BACKGROUND



Acknowledgements

On behalf of the DSEG, this document was first primarily authored by:

The Displacement Tracking Matrix (DTM) is the United Nations International Organization for Migration's (IOM) system to track and monitor displacement and population mobility. It is designed to regularly and systematically capture, process and disseminate information to provide a better understanding of the movements and evolving needs of displaced populations, whether on site or en route.

Data Science Initiative: The Data Science Initiative is a project of the City of The Hague. The mission of the Data Science Initiative is to harness the value of data science and artificial intelligence for peace, justice and security.

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Contributors: Bill Drexel (IOM DTM Global Team), Amar Ashar - Assistant Director of Research & Jenna Sherman - Senior Project Coordinator (Ethics and Governance of AI Project - Harvard Berkman Klein Center for Internet & Society), Jacopo Margutti - Humanitarian Data Scientist (510 Red Cross), Jill Capotosto & Sam Corden (Jackson Institute for Global Affairs at Yale University), UN-OCHA Centre for Humanitarian Data, Translators without Borders, UNICEF, World Food Programme.

Front and back page photo credit: Michael Dziedzic.

With thanks to: The Netherlands Ministry of Foreign Affairs and The Municipality of The Hague

Ministry of Foreign Affairs

Den Haag

Version 1:
April 2020

Through an initial mapping, we identified several concerns from sector stakeholders:

- **Peer Review** (or lack thereof)
- **Accountability** (who is?)
- **Communications** (how to communicate complex processes and results)
- **Inclusivity**
- **Transparency**

It became clear that this topic transcends a pure technical discussion, and led to the development of the ethical framework, making it technical but for a practical audience.

The framework was published in April 2020.

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FRAMEWORK JOURNEY

Stage of Data Science Lifecycle		Description
0	Fundamentals	• Humanitarian Principles and Ethics • AI Ethics • Data Responsibility • Human Rights • Risk Mitigation
1	Problem and Solution Exploration	• Problem recognition – breaking down the problem and articulating what you want from a solution; • Search for solutions, ideas and collaborators: is AI the ideal solution?
2	Data Journey	• Data collection • Data processing and protection
3	Algorithm	• Ethical principals of algorithmic design
4	Reliance on Outputs	• False negatives and false positives • Accountability to affected populations

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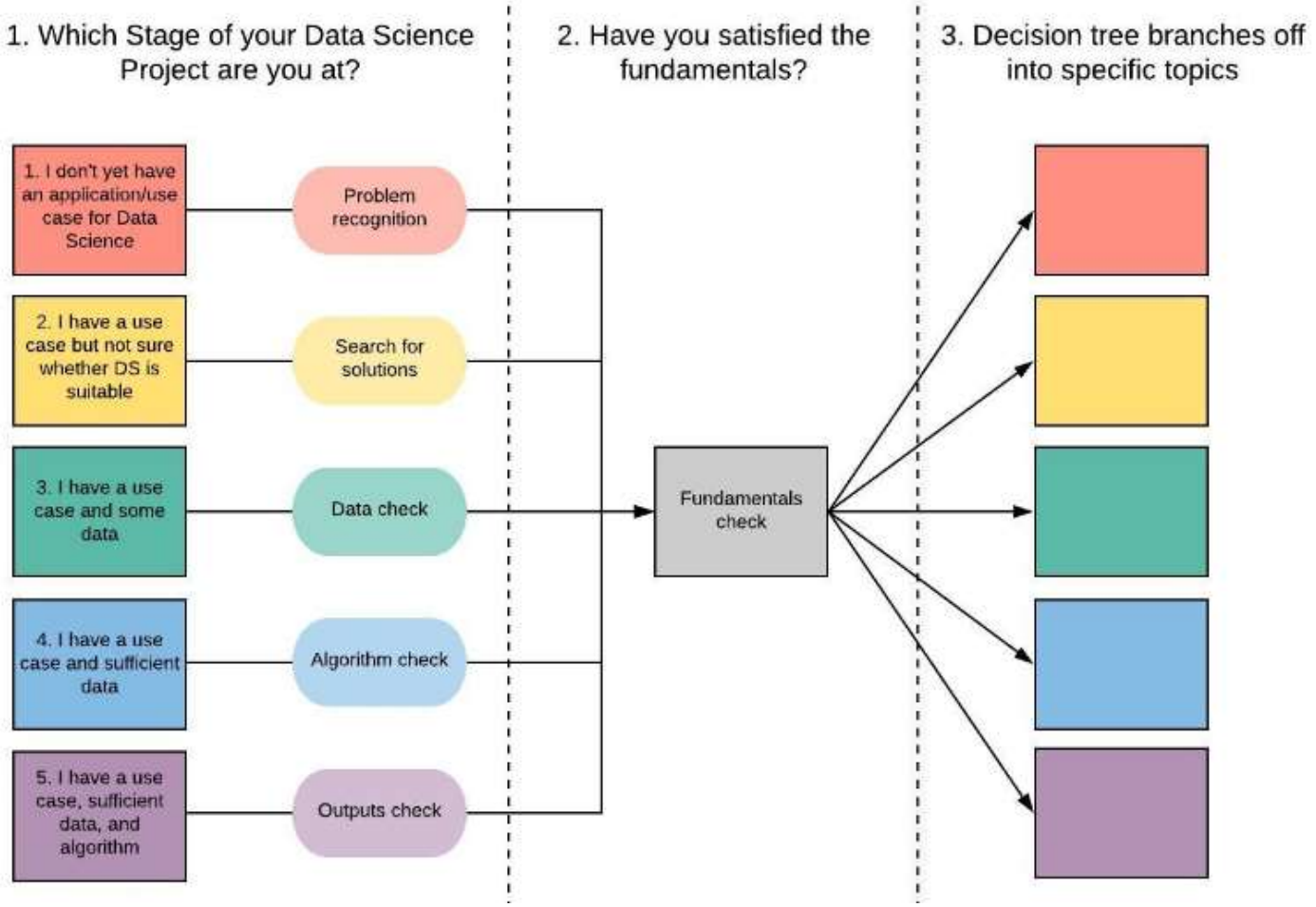
THE DECISION TREE



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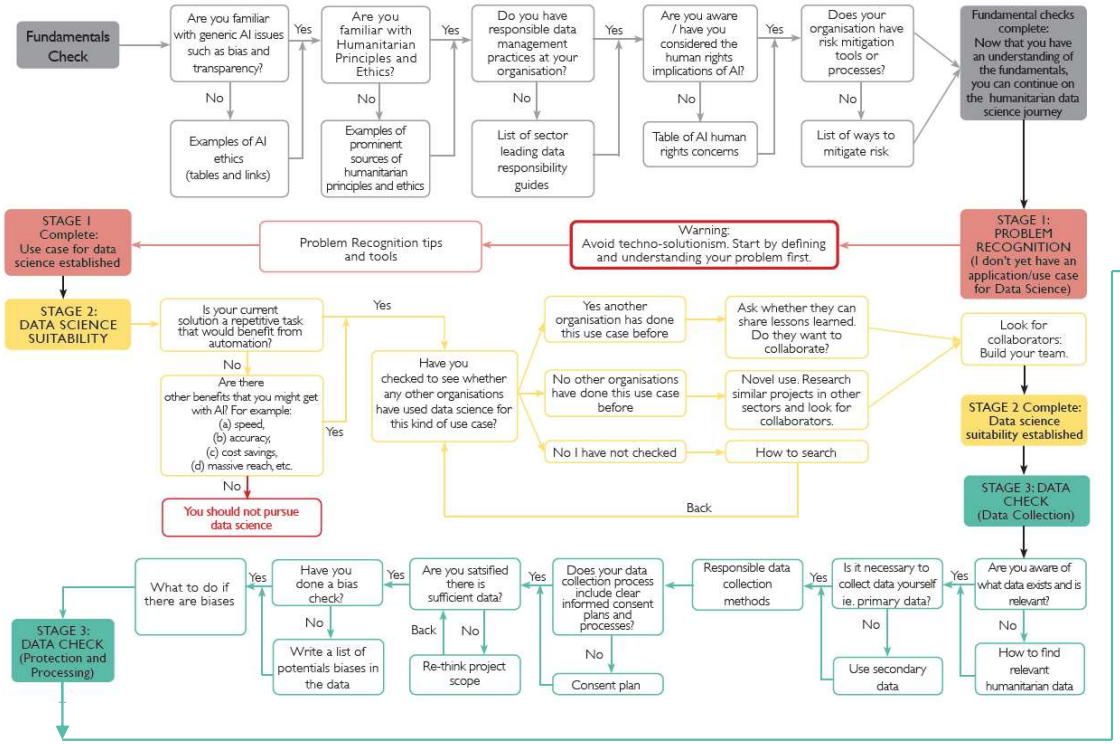
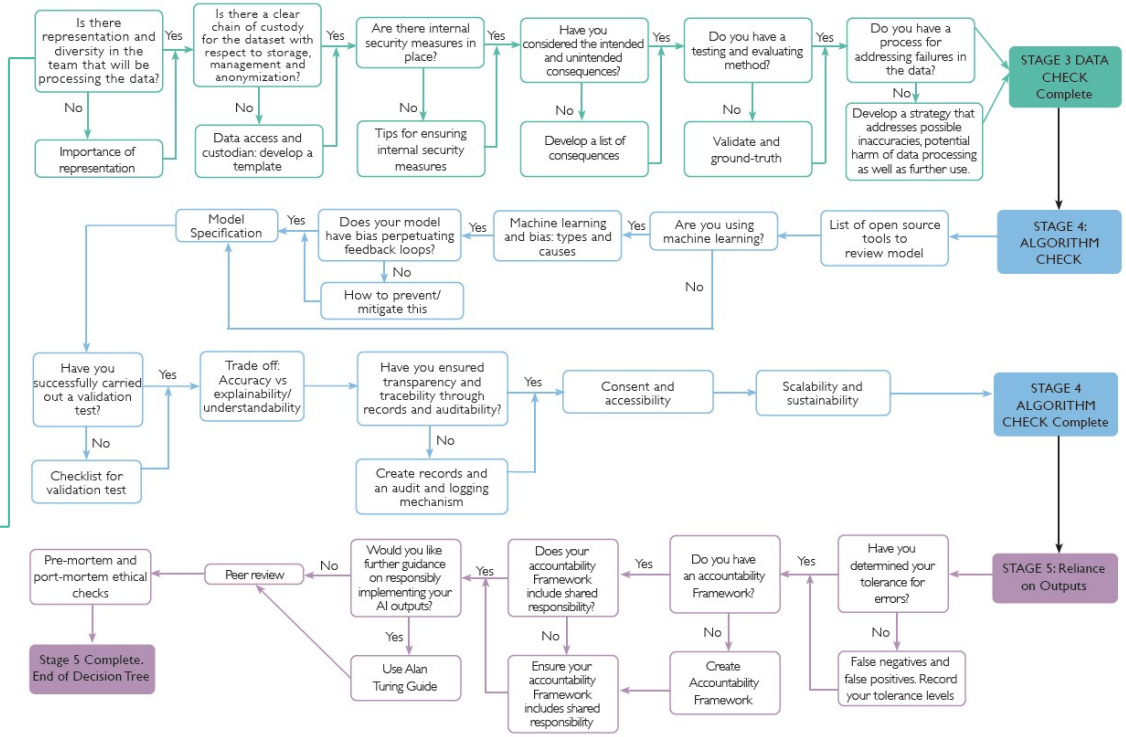
THE DECISION TREE





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Decision Tree in Action

Decision Tree for Ethical Humanitarian Data Science

Fundamental Check | Problem Recognition | Data Science Suitability | **Data Check** | Algorithm Check | Reliance on Outputs

STAGE 3: DATA CHECK

Welcome to the data check stage of the decision tree.

The data collection process is incomplete without ensuring that the data is shared with the affected community. It should also ensure that participation is not limited to collection alone but also entails the important step of communicating the data with the community using appropriate communication channels. Communication should be conducted in an accessible and timely way, using appropriate language/dialects and dissemination tools for feedback.

← Back | Next → | Restart

Understanding and Mitigating Bias

Bias Check

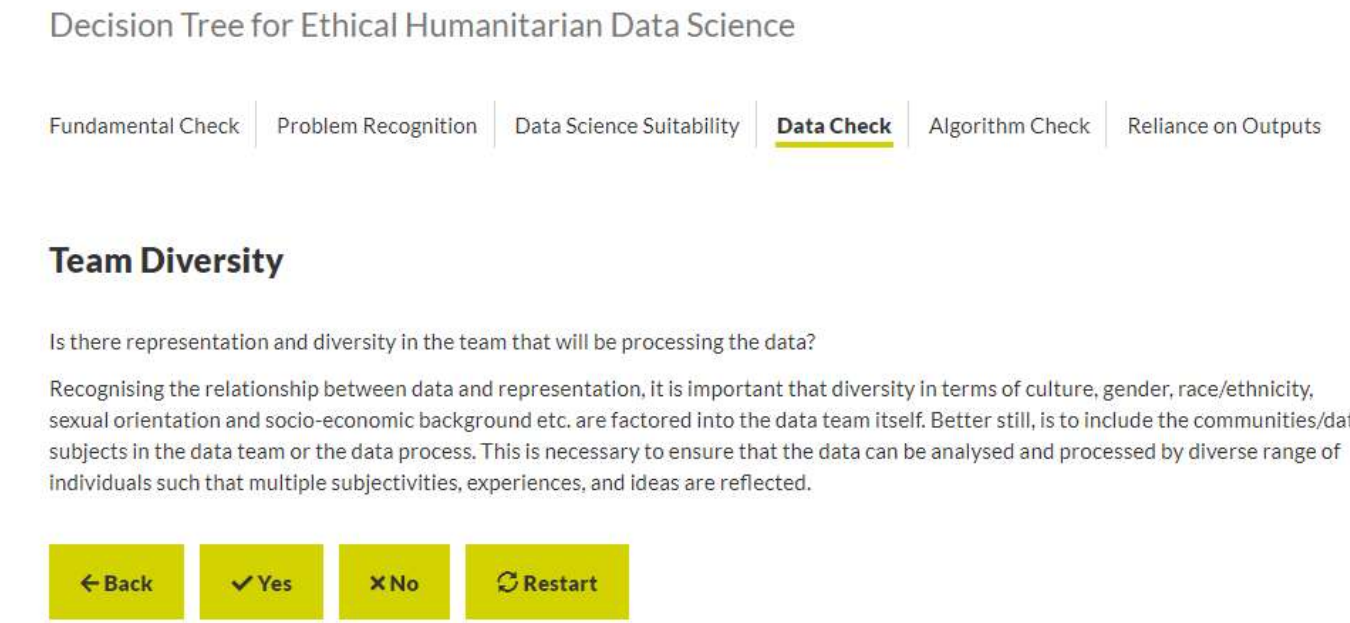
Have you taken steps to review and catalogue all potential types of bias in your data collection plan?

There are many different types of biases that can be present in data. Below is a table that explains some prevalent types:

Type of Bias	Description	Example
Historical Bias	Captures the world as it is, or as it was. Even if the data is perfectly measured and sampled, the nature of the data (ie. capturing historical discrimination) may produce outcomes that are not wanted.	If a Google Image search for "professor" were undertaken, the results would be predominantly male images. This is because historically, professors were predominantly male, though in many countries this is no longer true.
Response Bias	Occurs when data is collected from human responses (often online). It causes bias because the responders usually do not represent the full population.	Following Hurricane Sandy, researchers used Tweets to try and understand human behaviour post-disaster. However, they found that most Tweets came from Manhattan, and very few came from the severely-hit region of New York.
Representation or Selection Bias	Occurs when the full target group is not captured, therefore skewing the dataset.	Data collected by smart-phone responses will only capture information from smart-phone owners which (in humanitarian contexts) is likely to exclude women, elderly and lower-income people.

Continued in Decision Tree

It's not just your data that matters



Continued in Decision Tree

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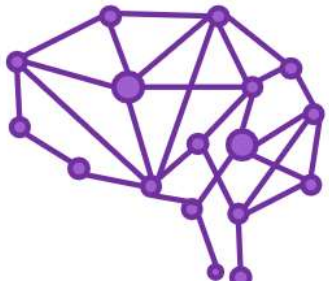
Algorithm Check

Decision Tree for Ethical Humanitarian Data Science

Tools

There are a number of open source tools available which you should use to gauge the impact, fairness and presence of bias in your algorithm. They include:

- Algorithmic Impact Assessment (Government of Canada).
- IBM AI Fairness 360 Open Source Toolkit.
- Google PAIR/Tensorflow What-If Tool.
- Fairness Indicators: evaluating, improving, and comparing models for fairness concerns in partnership with the broader Tensorflow toolkit.
- Aequitas Bias Report.
- SHAP (SHapley Additive exPlanations).
- LIME.
- 510 Red Cross's Ethical AI checker



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COMPLETION

Rob from IOM

Full name
TRIGWELL Robert

Organization name
International Organisation for Migration

Organization type
UN Body

Update profile

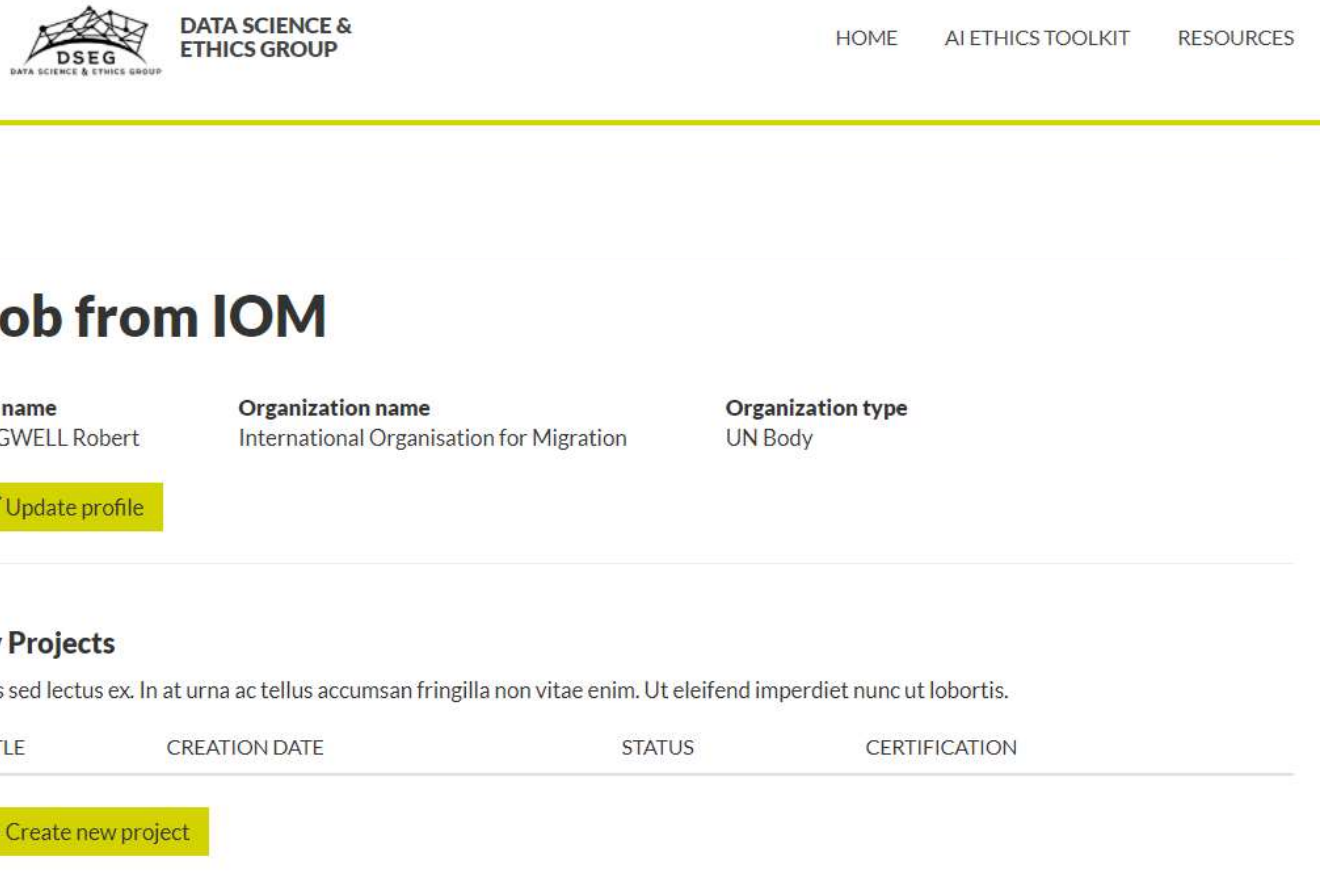
My Projects

Cras sed lectus ex. In at urna ac tellus accumsan fringilla non vitae enim. Ut eleifend imperdiet nunc ut lobortis.

TITLE	CREATION DATE	STATUS	CERTIFICATION
TEST: Forecasting displacement in Southern Ethiopia	Nov 04 2020	Completed	Download

+ Create new project

KNOWLEDGE GENERATION



CERTIFICATION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CERTIFICATE
OF COMPLETETION

THIS CERTIFICATE IS PROUDLY PRESENTED TO THE PROJECT:

Internal Displacement in Ethiopia

Submitted by
Dr. Edrisa Turay
International Organization for Migration
That has successfully completed Data Science Ethics Group (DSEG)
Decicion Tree for the Ethical use of Advanced Data Science Methods
in the Humanitarian Sector

Date: 03-NOV-2020

Certificate Code: 123XXXX

Organization type
UN Body

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ATION DATE	STATUS	CERTIFICATION
04 2020	Completed	Download

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Looking Forward

- Repository of Data Science projects and resources
- Expanding the Decision Tree to cover race, gender and operational ability
- Writing policy guidance for the use of AI for IDPs
- Publish 6-8 collaborative thematic papers on data science and ethics

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