

Sheffield Hallam University

Name of Organisation:

Sheffield Hallam University

Fellowship Summary

The complex nature of global challenges today can be epitomised within the domain of the Sustainable Development Goals (SDG). The non-orthogonality of the SDGs means that global challenges of today cannot be tackled in isolation. Thus, in the big data era we need to prepare future scientists to cope with the dynamics, volumes, variety, and veracity of data and raise awareness, through data, of how interconnected and complex the SDG data attributes are.

The fellowship is for those directly/indirectly involved in handling multi-faceted data in any field. The fellowship is designed to prepare Fellows for interdisciplinary operations in the big data era, focusing, mainly, on proper management of data intensive activities leading to data-driven solutions to societal challenges. Preference will be given to those with a clear passion for their area of work who can demonstrate ability to impart newly acquired skills onto colleagues upon completion of the fellowship.

Weblink for Candidates

<https://www.shu.ac.uk/national-centre-of-excellence-for-food-engineering>

Eligibility

IBDM-SDG is designed for data practitioners focusing on tackling real life applications using computing and data analytics tools, techniques, and skills. Priority will be given to those who focus on addressing specific aspects of SDGs modelling, monitoring, and evaluation in an interdisciplinary context. Basic skills in data analysis and/or coding are required. The training aligns with the joint initiative between the United Nations Statistical Division (UNSD) and the Foreign, Commonwealth and Development Office (FCDO) (<https://unstats.un.org/capacity-development/unsd-fcdo/>) that seeks to make SDG data open and available to the widest possible audience, supporting 20 pilot countries aimed at promoting data-driven decision making.

Proposed Fellowship Dates

26/02/2024 to 22/05/2024

Proposed Activity

This programme will take the Fellows through a set of hands-on and participatory activities aimed at appreciating the power of big data modelling within specific areas of everyday life.

Week 1

Day 1: Registration, informal introduction to the NCEFE and University facilities – library, computer clusters, leisure centres etc.

Days 2-5: Introduction to SDGs. Fellows introduced to the subject of study and the relevance of the data science field. They are guided to appreciate the complex interactions of SDGs

through indicators and targets as well as appreciate each SDG as a potential big data source node.

Week 2

Problem identification: Fellows are tutor-led to align their routine functions with as many SDGs as possible and identify key challenges and opportunities. Through real-life examples, they explore each SDG identifiable data attributes as a potential knowledge base. Examples from the Millenium Institute, the WB SDG Atlas, and Our World in Data. Demonstrations of real-life applications based on NCEFE's rice milling KoolMill Plant.

Week 3

Introduction to interdisciplinary, data science problem solving. Examples are based on descriptive and inferential statistics using conditional check functions in MS Excel.

Week 4

Days 1 and 2: A study visit to the Sussex University SDG monitoring centre (<https://www.sussex.ac.uk/ssrp/research/sdg-interactions>) and presenting at the Data Intensive Science Centre at the University of Sussex (DISCUS).

Day 3-5: Reflecting on lessons from Sussex; real-world case studies.

Week 5

Introducing core tools for data sourcing – accessing various sources of data. Fellows learn how to remotely download and upload large multi-faceted data and how to set up and share open source cloud storage spaces.

Week 6

Introduction to R and Python. Accessing and installing R and Python. Importing and exporting data, performing numerical operations, graphical visualisation of data, installing packages and libraries

Week 7

Foundational data science skills for data visualisation in R and Python – two and three dimensional tutor-led visualisation of SDG and COVID-19 data attributes; parameter tuning, loops and animation.

Week 8

Day 1: Training on harnessing data through citizen science using Internet of Things (IoT) techniques – devices and sensors. Privacy, GDPR, and cyber security aspects and mitigation. Examples from NCEFE KoolMill plant.

Day 2-5: Unsupervised modelling of SDG and COVID-19 data. Identifying naturally arising patterns – similarities and dissimilarities in the data at hand.

Week 9

Day 1: A visit to DEFRA or DWP for post-pandemic impact familiarisation.

Day 2-5: Supervised modelling – deep learning, random forests, SVM, Neural Networks and Logistic Regression in R and Python. Importance of interdisciplinarity and prior knowledge and being aware of overstating facts. Drafting a joint poster/paper.

Weeks 10 and 11

Applications of supervised techniques based on the underlying reasoning for allocating new cases to classes (classification) and how these are not tool-specific. Refining the poster or paper from the course.

Week 12

Day 1-2: Training on connecting and managing data and models on the Cloud-Azure.
Training on online meetings and sharing screens on ZOOM etc.

Day 3-4: Study visit to London or Sussex and making a presentation.

Day 5: Closing the course.

Priority Theme

Science and technology for development