iDODDLE PROJECTS 1 and 2

Project Titles

Project 1: How and why are digital technologies used in daily life?

Project 2: How can digital technologies used in daily life help tackle climate change?

Project Description (Projects 1 & 2)

The digitalisation of daily life can have both beneficial and adverse impacts on carbon emissions. These impacts depend on how and why people use digital technologies to move around, shop for food, manage their domestic environment, or generate and use energy. Digitalisation can help reduce carbon emissions by: (1) substituting for physical movement of people or goods; (2) displacing the need to own products and appliances; (3) providing platforms for exchanging goods and reducing waste; (4) controlling and managing energy use; (5) coordinating how services are provided. These potential benefits of digitalisation are made available through a range of apps, services, platforms, and technologies (Wilson et al. 2020). Digitalisation may also result in carbon emissions going up if more and more energy-hungry activities become embedded in the routines of daily life. Distrust in how data are collected and used, and unequal access to digital infrastructure, can also undermine the potential benefits of digitalisation (Grunewald & Reisch 2020).

These projects will collect and analyse data from a large sample of living lab households to provide new insights on the links between digitalisation in daily life and carbon emissions. The living lab households are a major new data resource available for these DPhil positions through the iDODDLE project. They provide a rich context for studying how people use digital technologies in real world contexts (see Further Information). The iDODDLE project also brings significant budget for supporting data collection, field trials, and interactions with the living lab households.

Specific research activities can be tailored to the interest of the successful applicants. Examples of research activities include:

- conducting grounded ethnographic or sociological research to understand how digital technologies have direct or indirect impacts on energy, material, and carbon emission (Hargreaves & Wilson 2017);
- developing and applying innovative data collection methods such as time-use diaries, technology biographies, in-home sensors, and smartphone apps;
- designing interventions and running field trials to test and measure how new digital applications are used in real-world households (Khanna et al. 2021);
- collaborating with living lab households to co-create a positive vision for how the digitalisation of daily life can help tackle climate change.

Understanding the use of digital technologies in daily life has both social and technical dimensions. While both Project 1 and 2 will work within this sociotechnical perspective, Project 1 will emphasise more social research to understand how and why digital

technologies are used in real-world contexts, and Project 2 will emphasise more technical research to test new digital applications and trial interventions for reducing adverse impacts. These differences in emphasis are reflected in the Person Specifications.

Person Specification: Project 1

Essential:
(1) Good Masters degree (or equivalent) in a relevant social science discipline including, but not limited to, geography, sociology, psychology, economics, environmental studies, architecture and the built environment.
(2) Strong empirical social science research skills.
(3) Experience with social science research methods including, but not limited to, interviews, surveys, focus groups, observations, video ethnography.
(4) Strong grounding in social science theory relevant to digitalised daily life including, but not limited to, technology acceptance, decision making, domestication, social practice, socio-technical transitions.
(5) Openness to interdisciplinary research.

Desirable:
(1) Experience working with household-level data.
(2) Familiarity with both qualitative and quantitative methods and data.

Person Specifications: Project 2

Essential:
(1) Good Masters degree (or equivalent) in applied social science or technical discipline including, but not limited to, human-computer interaction, user-centred design, psychology, engineering, computer science and IT, economics, public health.
(2) Good technical skills handling digital data.
(3) Experience with applied social science or technical research methods including, but not limited to, statistical analysis, data science, data visualisation, time use diaries, experimental designs.
(4) Openness to interdisciplinary research.

Desirable:
(1) Experience designing, implementing, or analysing interventions or field trials.
(2) Familiarity or interest in using digital technologies including smartphones or sensors for data capture.
(3) Familiarity with both quantitative and qualitative methods and data.

PROJECT 3

Project Title

Project 3: What are the impacts of digitalisation on energy, materials, and carbon emissions?

Project Description (Project 3)

Global energy, industry, and land-use models are widely-used tools for informing climate policy. These models have no explicit representation of digitalisation and its impacts. Improving models' capacity to simulate energy and material flows associated with the digitalisation of daily life will strengthen the evidence base for effective policy design.

This project will provide quantitative analysis and future scenario narratives to understand the impacts of digitalised daily life on energy, materials, and carbon emissions. Collaborating with energy and material flow modelling groups at the International Institute for Applied Systems Analysis (IIASA), the successful applicant will advance modelling capabilities for representing the climate impacts of digitalisation.

Examples of research activities include:

- estimating the quantities and value of material stocks, flows, and waste streams associated with global sales of digital devices and hardware (Malmodin et al. 2018)
- developing analytical and empirical approaches for representing digital devices and infrastructure in global energy and material flow models (Krausmann et al. 2020, Fishman et al. 2021)
- co-creating scenario narratives for the digitalisation of daily life based on enabling trends in digital infrastructure, societal and cultural values, and lifestyle changes (Brugger et al. 2021)
- using scenario modelling analysis to test policy strategies for steering digitalisation towards public policy objectives including climate change mitigation (Grubler et al. 2018)

Person Specification

Essential: (1) Strong quantitative skills. (2) Capabilities in quantitative modelling. (3) Interest in collaborating with global modelling groups at collaborating institutions.

Desirable: (1) Experience with energy or material flow accounting (e.g., lifecycle analysis) or simulation modelling. (2) Openness to interdisciplinary research.

Essential:
(1) Good Masters degree (or equivalent) in applied social science or technical discipline including, but not limited to, energy systems analysis, lifecycle analysis, input-output modelling, material stock-flow analysis, economics, environmental assessment.
(2) Good technical skills including relevant software for handling and analysing quantitative data.

(3) Experience with applied social science or technical research methods including, but not limited to, statistical analysis, data science, data visualisation, simulation or optimisation modelling, systems analysis, integrated assessment.
(4) Openness to interdisciplinary research.

Desirable:
(1) Experience working with energy system models or material stock-flow models or accounting tools.
(2) Familiarity with literature on global climate change mitigation scenario modelling.