The
Alan Turing
Institute

Keep Wales Tidy and Keep Scotland Beautiful
Data Scientist

TINDSG-004

#imagesformodelling #datastudygroup

About the Organisation

[Keep Wales Tidy](#) (KWT) and [Keep Scotland Beautiful](#)(KSB) are both charities who are committed to working with local communities across the UK to protect our environment now and for the future. We have a shared vision to combat climate change, tackle litter and waste, and protect and enhance the places we live, work and visit. As part of our work KSB and KWT conduct the independent elements of the statutory surveys on litter and environmental quality on behalf of every Local Authority in Wales and Scotland respectively. The models we use for these surveys, called Local Environmental Audit and Management System (LEAMS) or LMS, produce a grading system by which governments are able to ascertain whether Local Authorities are meeting their obligations to keep their streets tidy and clear of litter.

Keep Wales Tidy collect our data through the LEAMS validation surveys. LEAMS surveys provide a 'snapshot' of litter and other local environmental quality issues across Wales and allows us to track trends over time. During the survey, we measure the quality of the local environment by recording the street cleanliness grade based on how much litter and dog fouling is present, types and sources of litter present, amount of graffiti, vandalism, fly-posting, dog fouling, weeds, detritus and chewing gum staining visible. We have also collected information on the sources of litter (e.g. individual, business, domestic or construction) and have increased our survey to collect data on single use plastics, PPE litter, verge cleanliness and drinks litter in order to inform relevant developments in policy. These surveys are carried out in person by the staff at Keep Wales Tidy and the data collected on Epicollect in order to utilise GIS to map results spatially.

Along a similar vein, Keep Scotland Beautiful also follow a comparable system for the collection of litter data. Currently sites are graded against litter grades from the Code of Practice on Litter and Refuse (Scotland) 2006 as a new method of data collection is being developed (the revised 'Litter Monitoring System' (LMS). The LEAMS process uses a combination of monitoring carried out by local authorities and Keep Scotland Beautiful. Each Local Authority conducts two LEAMS audits during each financial year and Keep Scotland Beautiful carries out a third audit to provide independent verification. Each audit assesses a randomly selected 5% sample of streets and roads. All Local Authorities but Moray are included in the programme. A subjective perception rating for litter presence is also recorded for each site which takes into consideration the full visible streetscape in context, including nearby open spaces where present. This provides a robust indicator of local environmental quality standard result for each site audited. Despite apparent differences in the Scottish and Welsh requirements for litter data collection, the LEAMS and LMS models are, for the intents and purposes of litter data collection via AI, directly comparable.

The data collected through these surveys is then used to create policy recommendations and help inform government policy in Wales and Scotland on littering, waste and environmental policy.

Role Description and Responsibilities

There is a growing interest in the use of AI in the gathering of litter data and whether or not image recognition technologies can be used to conduct LEAMS or LMS surveying at scale. In order to facilitate this investigation, Keep Wales Tidy and Keep Scotland Beautiful have agreed to start collecting a database of images of litter so that they can be utilized in a DSG challenge around the creation of a litter recognition model which could be applied to statutory cleanliness standards. It would be one of the roles of an intern to work with us to assess the first batch of collected images, evaluate their suitability for AI purposes, and make recommendations for any improvements/changes for future data collection in order to prepare these images for use at a DSG.

An intern would also be required to work alongside the policy and research teams at KWT and KSB to research and explore possible modelling approaches that could be used to classify the cleanliness of an area from its imagery. Working with staff from KWT and KSB to look at LEAMS and LMS models for the collection of litter data, they would identify any promising approaches which could then be explored in more depth at a DSG.

Additionally, given that any model would involve the capturing of images in public places, an intern would also be asked to consider the ethical and security implications of using AI in this field and make recommendations for the safe and ethical collection and use of the data in this field. This will form a part of helping KWT and KSB shape their future policy for AI, and make recommendations for how they can incorporate AI into the organisation going forward.

Both KSB and KWT have strong links with academic institutions which could support the work of the internship (Stirling University and Cardiff University respectively). This work will form part of the wider strategic aims of Welsh and Scottish Governments who we expect to have significant interest in this work.

Working on this project offers an intern an opportunity to work on a high-profile project with national significance and develop new ways of utilising AI in a field that has thus far received little attention from the field.

Expected Outcomes

At the end of the internship there would be several outputs that would form the basis of a DSG challenge. Firstly, a database of images which are useful and suitable for usage in an AI modelling context. Secondly, a written report identifying any modelling approaches that the intern has found to be helpful or potentially applicable to the litter context. These could be used to help narrow down working ideas in a DSG challenge.

Furthermore, at the end of the internship KSB and KWT will have broadened their depth of knowledge into AI and co-produced a policy document which lays out best practice in litter data collection using AI. We would also create a 5 or 10 year plan for how AI can be utilised in our work and increase the level of detail that we can collect, this would help inform policy across Wales and Scotland (including national and local government level policy).

Supervision and Mentorship

Keep Wales Tidy will be the lead organisation for the purpose of supervision, but a team will be established from both organisations which will include data an technical support, policy expertise and litter data experts in order to ensure that there is adequate support and communication across both organisations.

Ideal Intern

The ideal intern for this role would have experience working with image datasets and preparing images for modelling purposes. Experience working with tabular data would be beneficial but not essential. They would also have a strong sense of the ethics surrounding AI and its use in the public realm. We are also looking for someone who is passionate about our work, interested in environmental policy and excited to be working on a real-world problem.

Internship Logistics

Both organisations have flexible working policies. Whilst office space is available, as environmental organisations the majority of staff work from home and online meetings are encouraged to limit travel and carbon emissions. Therefore, the candidate could be based anywhere in the UK although some travel may be required for meetings at office locations in Cardiff or Stirling. IT equipment and support can be provided.

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