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Geoscientific Instrumentation Methods and Data Systems Discussions

Interactive comment on "Semi-automated roadside image data collection" *by* Neal Pilger et al.

Anonymous Referee #1

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This article reports on a system to acquire ground reference data on crop fields from a car mounted side-looking set of cameras. The work is interesting and seems to focus on an operational application of governmental/environmental agencies. The paper is clear, easy to read and focused on a real-world problem. There are, however, a set of concerns:

A fuller discussion on training and testing data acquisition is needed in the introduction. In some instances a small number of geo-referenced photos may be adequate but this is far from a complete discussion. Issues of sampling (notably the sample size and design) and basic data collection (the spatial grain) etc. need fuller discussion. Sample design is a key issue that needs fuller discussion in the article as the approach used is not a probability sample. As such it may meet many needs but not all (e.g. as

noted below it would be an unsuitable sample to use in image classification accuracy assessment).

The description of the test site must make it clear that CS sites are also present - this class is not mentioned yet its presence is critical to the study.

In the data processing the discussion is very vague. It would be really useful, for example, to know how many photographs were retained and used.

The data processing section needs to address aspects of privacy (which do get mentioned late on the paper on p12). The system really needs to be able to acquire data in a way such that faces and items such as car licence plates are blurred out. This type of processing is quite basic in systems that seek to ensure GDPR compliance.

More details on the labelling of photographs is required. Were photographs labelled by just a single person? In many studies labelling is often based on 3+ annotators – allowing basic consensus approaches to be used as well as flagging uncertain cases.

The authors deem their results to be acceptable. They may well be but it should be based on strong evidence and reasoning. What level of error is tolerable? The authors also need to recognize that the accuracy of the system will vary with relative abundance of the classes, accuracies in the order 80-100% seem quite feasible. Is the lower value stlll acceptable?

The work in many ways is an automated version of a basic windshield survey that has been used for decades. Why not compare to a windshield survey – a qualified individual sitting as a passenger in a car would probably be very accurate.

There are a variety of obvious issues that are not addressed well. These range from clear concerns such as the presence of hedges/fences that obscure view to problems of inter-cropping. These probably do not crop up much in the test site but deserve mention.

A potential problem with the work is the reader making an innocent mistake and think-

ing the system would be useful as a source of testing data for validating/accuracy assessment of satellite image classifications. This system is not (and the authors do not claim it to be). It should still be recognised that good practices for validation call for a probabilistic sample – the sample acquired by the system does not meet this – it is biased (to roadside locations) and unrepresentative. This issue should perhaps be noted simply to stop an interested reader making a mistake.

I cannot help wonder – why use this system and not a basic, nadir viewing, photographs from a drone/UAV? Cheap, easy to use from roads etc. and is nadir view that fits with the standard ground data. Surely a UAV based camera system offers a better outcome?

Minor issues: - The term 'corroboration data' is unclear – perhaps use 'ground reference data'? - Clarify the last sentence of the introduction – what is the role of the orbital data? - It is awkward to refer to 'RS' in Table 2. On superficial reading this might be interpreted as meaning remotely sensed (e.g. from satellite). Need to be clear this is from the car-based camera system.

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