Introducing AIDE: a Software Suite for Annotating Images with Deep and Active Learning Assistance

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Ecological research like wildlife censuses increasingly relies on data on the scale of Terabytes. For example, modern camera trap datasets contain millions of images that require prohibitive amounts of manual labour to be annotated with species, bounding boxes, and the like. Machine learning, especially deep learning [3], could greatly accelerate this task through automated predictions, but involves expansive coding and expert knowledge.

In this abstract we present AIDE, the Annotation Interface for Data-driven Ecology [2]. In a first instance, AIDE is a web-based annotation suite for image labelling with support for concurrent access and scalability, up to the cloud. In a second instance, it tightly integrates deep learning models into the annotation process through active learning [7], where models learn from user-provided labels and in turn select the most relevant images for review from the large pool of unlabelled ones (Fig. 1). The result is a system where users only need to label what is required, which saves time and decreases errors due to fatigue.
**Fig. 1:** AIDE offers concurrent web image labelling support and uses annotations and deep learning models in an active learning loop.

AIDE includes a comprehensive set of built-in models, such as ResNet [1] for image classification, Faster R-CNN [5] and RetinaNet [4] for object detection, and U-Net [6] for semantic segmentation. All models can be customised and used without having to write a single line of code. Furthermore, AIDE accepts any third-party model with minimal implementation requirements. To complete the package, AIDE offers both user annotation and model prediction evaluation, access control, customisable model training, and more, all through the web browser.

AIDE is fully open source and available under https://github.com/microsoft/aerial_wildlife_detection.

**References**