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Short webinars for environmental policy-makers and practitioners

Remote Sensing – more than meets the eye webinar series 2023

Harnessing deep learning in the war against pests

The following questions were asked during our live webinar with Brent Martin but due to time restrictions, we were unable to answer these in the session.

Has deep learning been tried on underwater images?

Yes. For example, I ran a project with Canterbury University students using deep learning to detect fish species in DoC's Baited Underwater Video (BUV).

What about AI classification of video for pest detection? Our identification often from the 30 sec video rather than the jpg that the camera initially took.

Our tool (CamTrapNZ) doesn't currently cater for video, but this can be trivially done by extracting still images from the video and classifying those, then taking a vote to find the most likely species, which is much more robust than classifying single images. More sophisticated techniques can also be applied to capture/analyse the animal's motion (position in space and gait) which is often also predictive.

Do you have a timeframe for getting the wilding conifer national map?

We will be generating prototype maps for our client by end of June but will likely continue beyond that to improve accuracy.

Is MWLR involved in genomics work on pests and could deep learning help with breeding out pests?

I'm not aware of genomic work currently underway at MWLR in this area. Machine learning techniques are applied in many ways to genomics, and deep learning would likely be a useful approach to try given the complexity of the data and relationships

Have you tried AI/deep learning approaches for the detection of animal behaviours in lab situations from video, as opposed to still, imagery?

See previous questions: there is work ongoing at Manaaki Whenua to investigate animal behaviours and traits, but we haven't applied deep learning to this just yet - it would definitely be a useful line of enquiry.

LUCAS has a minimum size of plantation mapped so doesn't capture all woodlots. How do you differentiate between wildings and woodlots?

How does the AI system deal with large quantities of a single species? i.e., mob of pigs, in which the shape, structure and even colouring is warped in result.

Are your pest identification models or labelled image data sets available in the public domain?

Not at present, although we do share our imagery with other organisations. We're also happy to share the software, which contains the model.

Have you done any work deploying the pest detection models on edge devices?

See previous questions: we have only done a small amount of experimenting with this so far but are interested in doing this.