

WATERFOWL DETERRENCE USING MACHINE VISION



The system is trained to identify and deter species like the Pacific Black Duck.



Prototype trailer-mounted system can be easily relocated.



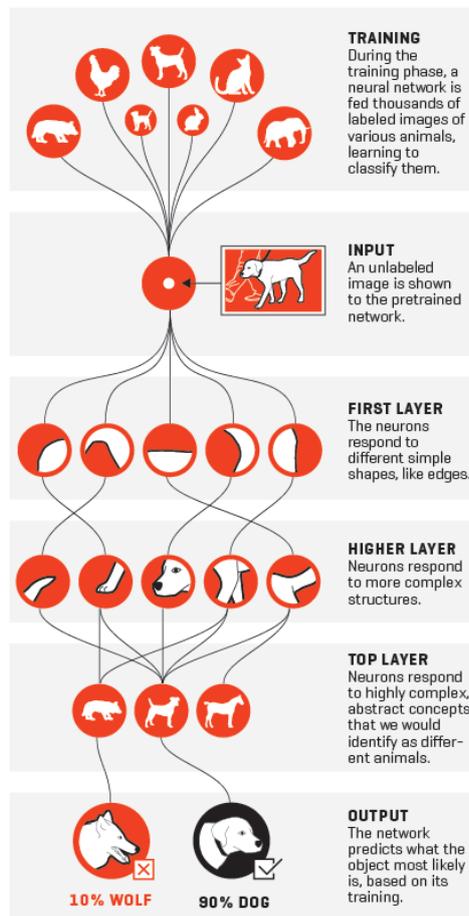
The pan-tilt-zoom camera scans for target species.

Machine vision to identify and deter bird species

Smart detect-alert/deter systems is a breakthrough technology that can locate, classify and deter specific wildlife that are a potential biosecurity or predatory risk to poultry. The system uses security cameras combined with machine vision to detect target species, then triggers a series of deterrents to scare them away.

Aquatic birds are the main reservoir for avian influenza (AI) viruses, particularly dabbling ducks such as Pacific Black Duck and Grey Teal. The presence of high AI-risk species on farms is a biosecurity issue for the Australian poultry industries.

Currently, this technology is being trialled for monitoring and controlling aquatic birds at a meat chicken farm.



Example of how a computer neural network works.

Source: <http://fortune.com/ai-artificial-intelligence-deep-machine-learning>

How it works

The “neural network” software is “trained” to identify target species using supervised training. The neural network, much like a brain, takes an image through a number of layers, and extracts features that allows it to recognise the type of objects contained within the image.

The software is run on a “gaming” computer to be able to “recognise” birds in security camera images in near real-time.

The example image on the following page shows how the neural network is able to detect Australian Wood Ducks but ignore the ibis. The camera used in this case was a pan-tilt-zoom camera with infra-red illumination at night.

The system in action

Farm installations will typically include one or more cameras near dams or feeding areas, with the image processing computer and deterrent controller located at a powered site such as an office (within 20km of the control site).

Trailer-mounted installations are ideal as they can be easily relocated to where the bird activity is.

Deploying deterrent systems before bird behaviours become established creates the highest chances of success. If bird activity is already established, a day or two of preliminary monitoring may help determine the behaviour pattern, the reasons (e.g. spilt grain) and the best deployment strategy.

Once the target species and location have been identified, suitable deterrents can be activated. The types of deterrents used will depend on the species and the situation.

Distress calls alone are highly effective against some aquatic birds. However, reinforcement may be required for those species that seek refuge on the water.

This may be achieved in the near future using aerial, aquatic or terrestrial-based vehicles that are navigated by the machine vision system.



Example of Australian Wood Ducks being detected and identified among a group of ibis.



Installation of the system on farm.

Further information

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Aquatic deterrent robot.

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