

**[Largely reduced workload for harmful animal trapping]**

The number of people in charge of animal control is dwindling with the aging of agricultural producers. The damage to the agricultural products by deer, wild boars, and monkeys is becoming more serious nationwide. A new remote-controlled auto-trapping equipment for harmful animals, "Robot HOKAKUN with a full view" capable of locking a target animal in a cage automatically, debuted as a dependable partner.

This robot is a harmful-animal trapping system taking advantage of the ICT (Information and Communication Technology) and IoT (Internet of Things) technology developed in joint research by ISE Company Limited (Ise, Mie), Institute of Natural and Environmental Sciences, the University of Hyogo, National Institute of Technology, Toba College, and others.

\*IoT: The communications among things such as electric appliances, vehicles, cameras, medical devices, and cages through connection to the Internet.

**[Automatically traps harmful animals while the user is sleeping]**

This system is an excellent trap, which has the capability of automatically capturing animals. In particular, it is equipped with multiple sensors, including an infrared camera that monitors the animals' movement and sensors that alarm animals' entrance. The system determines the presence and absence of harmful animals and closes the cage door to capture animals.

The previous model was the "HOKAKUN in full view on Cloud." The remote-controlled type required the user to determine to close the cage door while watching the image on the smartphone. The new model has a more advanced function that captures the target harmful animals without the user's decision (even when sleeping).



Image 1: A deer entering the cage



Image 2: Scene of remote-control on a smartphone  
(Both images were supplied by ISE Company Limited)

Since all the movies are stored on the Internet cloud, multiple users can share the information. It is possible to monitor multiple cages by the whole local area. With the function combining remote-monitoring and auto-trapping, the new system can avoid mistakes that non-target animals are captured and largely save the workload for animal capture.

**[Version up only by 200,000 yen]**

The damage to agricultural products, such as rice, vegetables, and fruits by harmful animals in the harvest season, was 15.8 billion yen in 2018 (source: Ministry of Agriculture, Forestry and Fisheries of Japan). The damage by harmful animals may lead to considerable problems, including the demotivation to continue farming, an increase in the devastated agricultural field, and sediment outflows because of a loss in understory vegetation in the agricultural and forestry industries in Japan. The “HOKAKUN in full view on Cloud” system has been introduced in 270 or more local areas in multiple prefectures such as Mie, Wakayama, Hokkaido, Hyogo, and Oita. “Robot HOKAKUN with a full view” (price: about one million yen) put in the market in summer 2019 has been introduced in about 30 municipal governments in Hokkaido, Yamagata, Tochigi, Mie, Nara, and Hyogo. The users, who have been using “HOKAKUN in full view on Cloud,” may update the existing system to automated type at the additional cost of only about 200,000 yen.

For more information on “Episode Series,” please visit the URL:

<http://www.naro.affrc.go.jp/laboratory/brain/contents/fukyu/episode/index.html>

<b>&lt;Project name&gt;</b>	<b>The special scheme project on advanced research and development for next-generation technology (Regional strategy project)</b>
<b>&lt;Project period&gt;</b>	<b>FY 2016 to 2018</b>
<b>&lt;Title&gt;</b>	<b>Establishment of a sustainable system for preventing damage by harmful animals using an integrated technology with ICT in collaboration between agricultural and forestry industries</b>
<b>&lt;Project research institute&gt;</b>	<b>The University of Hyogo</b>