System for early detection of fish diseases

Development status

Final Phase

The technology is routinely used.

IP protection status

CZ Patent, nr. 307309, Method of contactless detection of the health status of fish and equipment to carry out this method

Partnering strategy

licensing

Institution

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Challenge

In the framework of research on the behaviour of fish, a visual recording is taken for the purpose of monitoring their movement, from which an analysis of the behaviour of the monitored fish is subsequently created. This research is essential as non-invasive methods are preferred. At present, when performing a known detection of the health of fish, there is physical contact between workers and fish who have to catch them from their natural habitat. Known non-invasive methods of detecting the health of fish are based on an assessment of their appearance by an expert who must have the fish at their disposal. The task of the invention is to create a method and device for contactless detection of the health of fish in their natural environment without the need for physical contact at the same time enabling continuous monitoring of the health.

Description

The invention makes it possible to monitor the fish in question continuously, and can detect them even in situations where the monitored fish are in a cluster, or are overshadowing each other or swimming. The invention uses the vessel in which the fish are located and in which they are allowed to swim, with the vessel having a transparent bottom under which the 3D camera and a source of structured light are arranged. The 3D camera and the structured light source are directed to the vessel, with the 3D camera sensing reflections of the structured light hitting the bodies of the swimming fish. Images from the 3D camera are stored and processed in a computer system. The essence of the invention is that the 3D camera's field of view and the high-resolution camera's field of view are placed in the monitored area, with the visual fields of both cameras at least partially overlapping. Overlapping field of view is important so that the images taken from both cameras over a different recording format contain similar content to the recording. A primary image shall then be taken with a 3D camera, for which at least one fish is verified on the computer in a suitable position, that is, to record the fish correctly directed to the high-resolution camera lens. After that, at least one secondary image shall be taken by a high-resolution camera on which

the recorded fish is localized by the computer in a suitable position, using data from the processing of the primary image. One of the greatest advantages of the invention is that a change in the health of fish is detected without physical contact. Fish are found in a natural environment, and are identified without stress and at the same time checked for their health to change. The method is suitable for continuous sampling, which can be fully automated. Automation based on the way fish stress is reduced and health changes are continuously detected, reducing farming costs while increasing farm yields. Another great advantage is that detection is carried out continuously, therefore it is possible to respond to changes in the health of fish without delay, thereby reducing the risk of spreading the disease from the breeding fish flock among wild fish. The device according to the invention is easily accessible and maintainable by hardware. The device requires minimal operator intervention in the course of detection, with the operator being promptly alerted to the detected change in health.

Commercial opportunity

Thanks to the readily available tracking device, the technology is available to a wide range of users. The subject of the licence is the SW. The invention is usable in the conditions of commercial fish farms in the prevention of diseases in intensive aquacultures, such as breeding in sea cages.