Slaughter-integrated laser marking of farm-animals

The aim of this laser-based technology is to establish laser markings for individual identification and tracing of slaughtered animals, in particular pigs, as their individual ear tags are often torn off during the bristle removal process. A laser marking directly before the bristle removal could greatly improve traceability. This serves on the one hand for product transparency, which is demanded by many modern consumers, and on the other hand for internal traceability to make it easier to sort out unfit carcasses after a laboratory test.

Challenge

Nowadays, slaughtering livestock is often done in large slaughterhouses, where a large number of animals are butchered and processed in a short time. Here, it is important to be able to trace back to which animal the body or parts of the body being processed belongs for as long as possible. This is important for example in order to comply with health and consumer protection regulations to be able to assign pieces of meat to specific animals and thus to specific farms after the processing of the carcasses. In this way, sick animals and their parts can be identified at a later stage after or during processing and if necessary removed from the process chain. With the present procedure, however, it cannot be ensured that the markings will survive the intense and abrasive process steps of depilation and cleaning.

Our Solution

Scientists at the Laser Zentrum Hannover, Germany, developed a laser-based method for processing and marking of animals during slaughter. The invention is based on individual robust laser markings, which can be applied very fast (within few seconds) and withstand the depilation and cleaning process. Automatized visual recognition of the markings is possible to realize a tracing system.

Figure 1: CAD picture of a demonstration unit. It can be used to demonstrate the method inside a slaughterhouse. The laser enters the demonstrator through the ring on the top. It leaves through the front window to set the markings. The window is surrounded by four push buttons (laser safety). A fan serves as smoke exhaust placed above the front window. Source: J. Foko.

Advantages

- Individual laser-based durable markings for identification and tracing of slaughtered animals.
- Robust technology — can be readily applied on livestock.
- Efficient marking due to fast laser-scanner technology with optimized parameters.
- Saves time and money due to fast and reliable tracing of insufficient carcasses failing to comply with health and food regulations.

Applications

Slaughter of livestock (monitoring, traceability).

Developmental Status

The required laser set-up and parameters were determined in an experimental study. The required laser set-up and parameters were determined in an experimental study. A neural network was trained which serves for image recognition and allows reliable recognition of the laser markings. A prototype

is under development and will be tested in a cooperative project under real-life conditions.

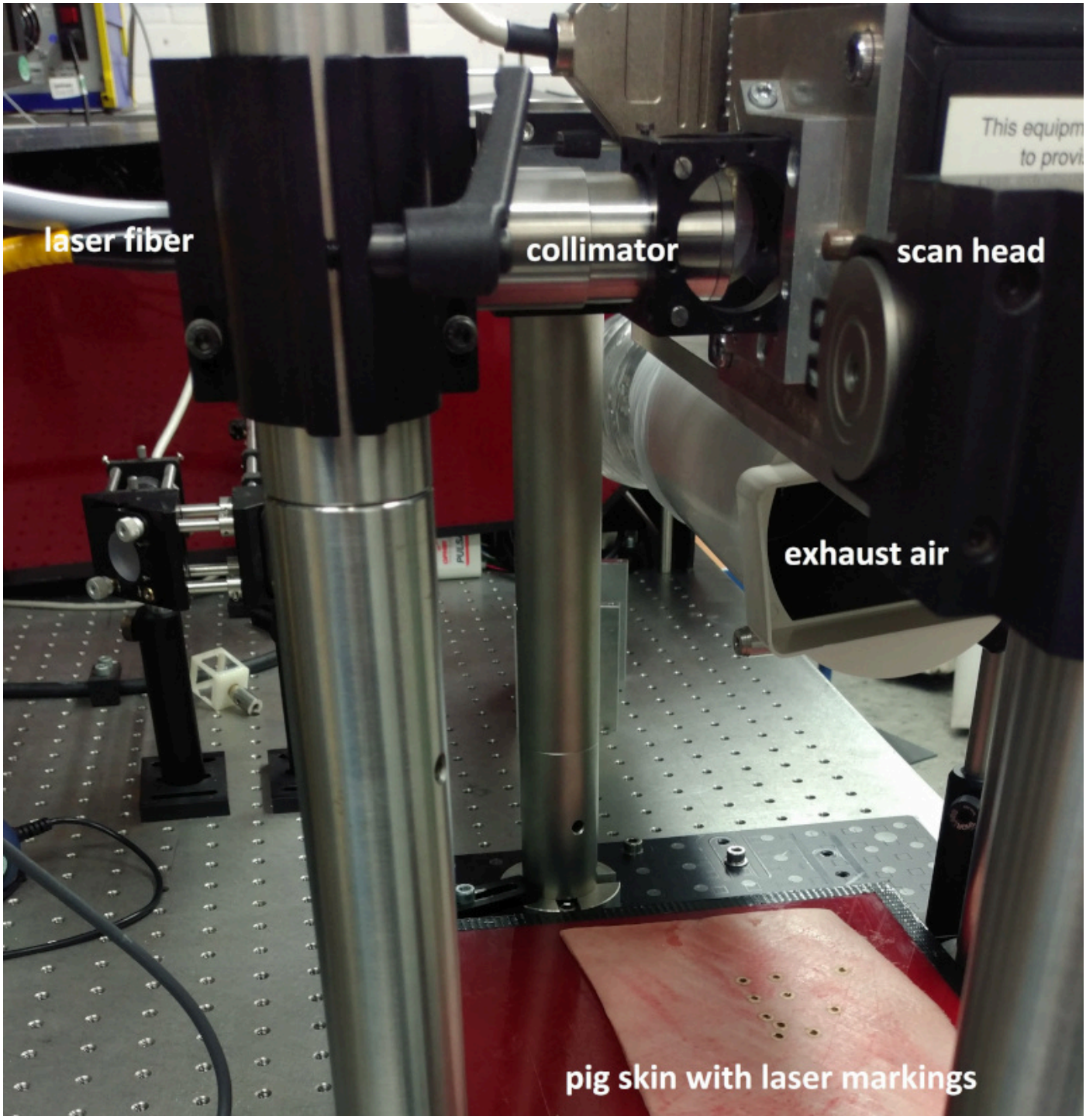

Figure 2: The laboratory setup to find out the best parameters for robust laser markings. Source: M. Geggus.

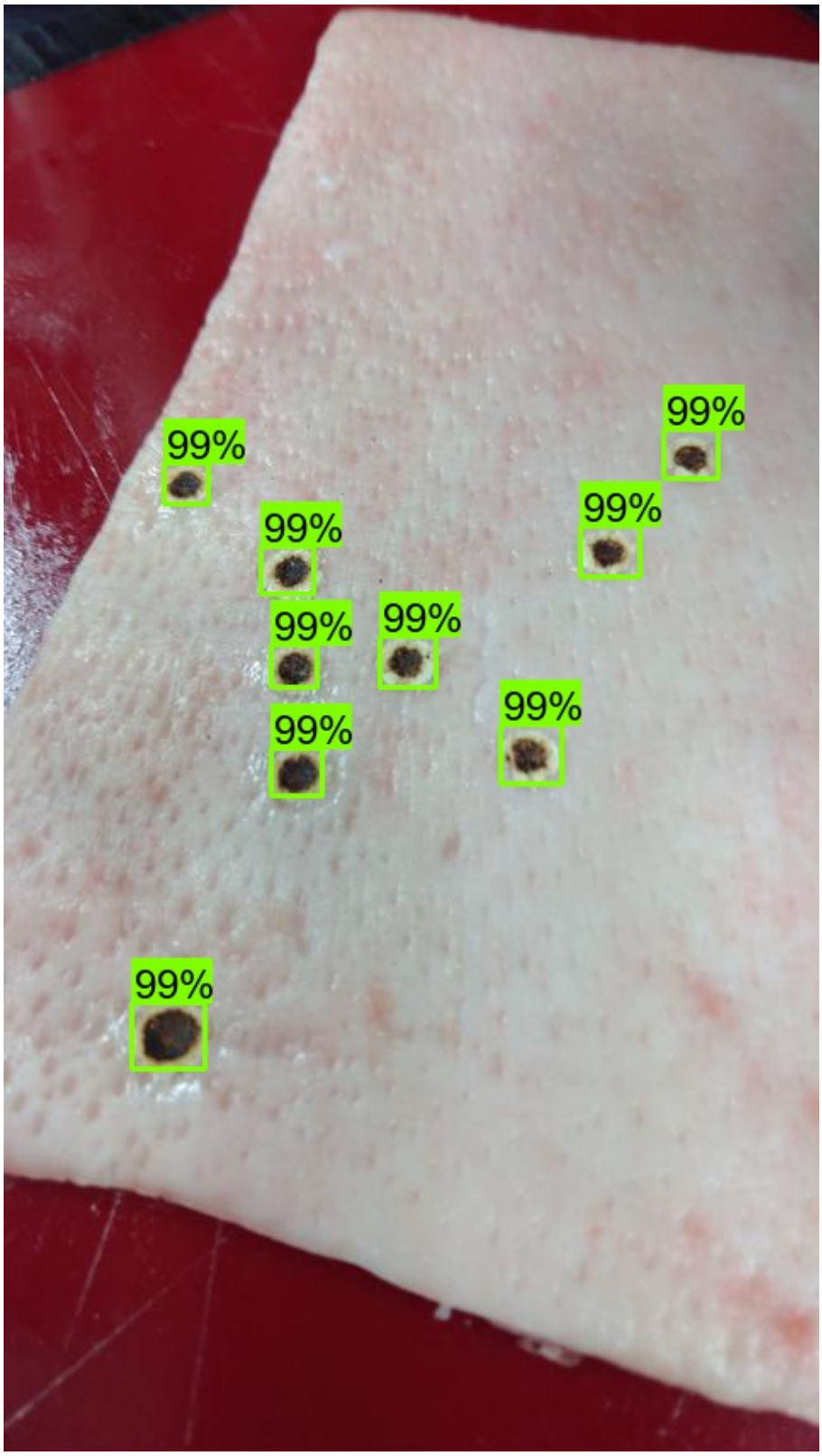

Figure 3: Pig skin with laser markings. A neural network serves as image recognition. It draws green

boxes around the markings with belonging confidence. Source: M. Geggus.

Patent Status

Granted German patent: DE102017129574B9
European patent application: EP3723489A1
Chinese patent application: CN111655038A

Patent holder: Laser Zentrum Hannover e.V.

Contact

Dr. Stefan Uhle
Patent Manager Life Science
E-Mail: suhle(at)sciencebridge.de
Tel: +49 551 30724 154
Reference: CPA-1933-LZH