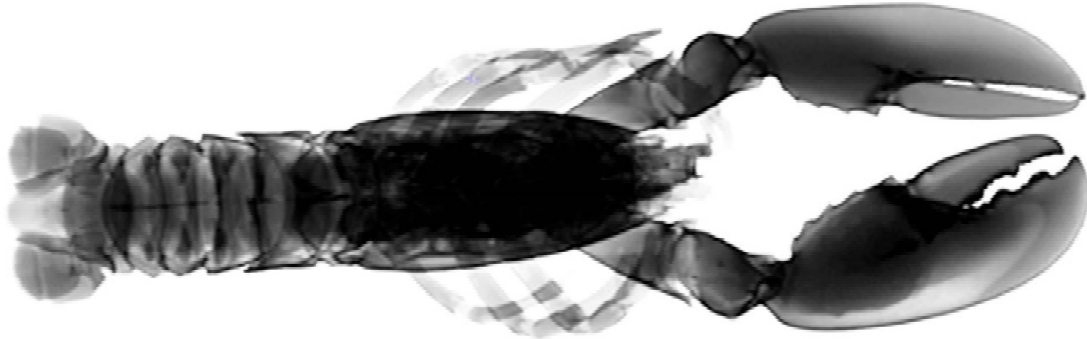




11/09/18



Lobster Grading - Meat Content Assessment

X-ray inspection of live lobsters

Value Creation

Quality assessment of lobster, crab, and other crustaceans, includes the assessment of the meat contents. High sensitivity X-ray imaging combined with advanced numerical image analysis has made it possible to grade lobsters relative to the meat content. Results have been compared with destructive meat assessment as well as with blood protein analysis and subjective grading processes, such as “squeezing”. Results shows a very good correspondence between true meat content and X-ray derived values.

The value proposition is a system that in a reliable, automatic, fast, and robust manner can provide a consistent and repeatable grading of a lobster, in order to secure its right price, and its correct quality grade. The basis of the technology is the intensive experience InnospeXion has gained in supplying fish bone detection systems for the fish processing industry world-wide.

How it works

When a lobster enters the system, an X-ray image will be taken. The X-ray image is then analyzed to estimate the quality of the lobster. In the image, the claws are identified, and the software grades the lobsters based on the claw(s) Area/Intensity, shell thickness, and histogram parameters.

The intensity in the X-ray image depends on the attenuation of the X-rays by the product. In the case of the lobster, this attenuation depends on the projected shell thickness and the meat content inside the shell. InnospeXion has chosen a three-fold classification based on segmentation of the digital image, and cross correlation between the three classes. This makes it possible to address the robustness of the measurement, as well as providing a robust measurement.

The lobster grading system is completely automatic and is easily integrated with other grading and sorting devices on the production line. The speed is up to 60 lobsters per minute, with a maximum lobster weight capacity around 2 kg.

Modern X-ray systems are intrinsically safe and are in general harmless considering the very short time a lobster passes through the system. Nonetheless, X-ray systems must be approved by local authorities in collaboration with the supplier.

The technology provides a very good correlation with the blood protein of the live lobsters, is non-destructive and hence can be used to address the lobster harvesting time more effectively.

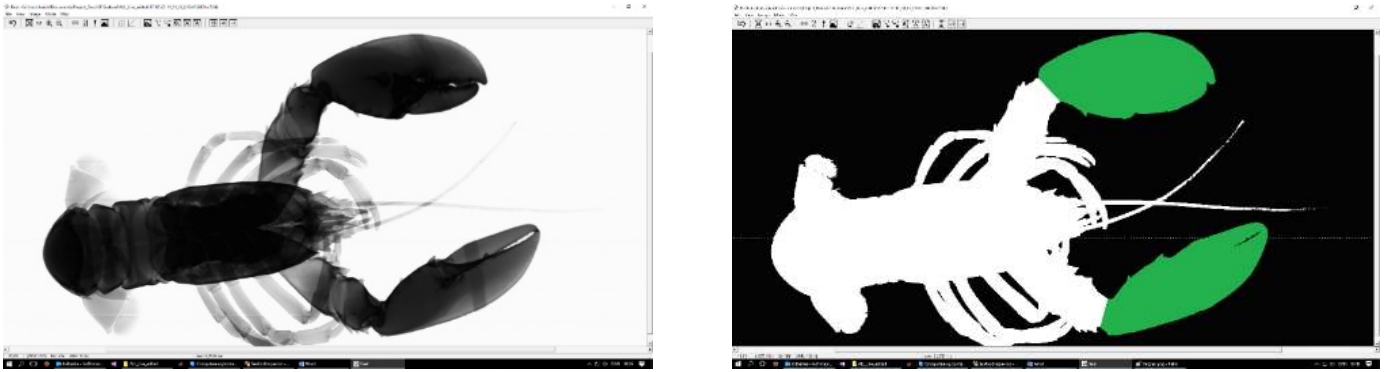


Fig. 2. In the X-ray image of an entering lobster, the software first detects the claws of the lobster. The claws' regions are used to establish the lobster quality



Fig. 3. Lobster entering X-ray system tail first. Fig. 4. The InnospeXion Lobster/Crustacean grading system is based on significant experience in providing fish bone detection system suitable for the harsh environment in the lobster processing industry.

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