Deep Detecting at Anuga FoodTec!

HEUFT *reflexx* ^{A.I.} realizes an X-ray image analysis which goes deeper – and exceeds the limits of visibility when detecting foreign objects. At Anuga FoodTec 2024 in Cologne, HEUFT SYSTEMTECHNIK GMBH will be taking a deeper look at what *deep learning* can do for in-line inspection in the food filling and packaging process.

Aluminium in pickles, wire in pasta, stones in red cabbage, metal in metal and glass in glass: dangerous foreign objects such as these are best detected using pulsed X-ray technology, which HEUFT launched over 20 years ago and has been continuously developing ever since. The fact that it achieves full detection reliability with minimal radiation is also thanks to the company's own hardware and software for real-time processing of the X-ray images. It has long been using artificial intelligence (AI) to detect and smartly evaluate a wide variety of objects. In order to further increase the reliability of foreign body detection and at the same time further reduce the proportion of incorrectly rejected uncontaminated food and packaging materials, a deeper AI discipline is now used as standard in X-ray systems from the HEUFT *eXaminer* ^{II} series - namely *deep learning*: HEUFT *reflexx* ^{A.I.} combines proven image processing methods with a multi-layered neural network which can independently process abstract patterns in a meaningful way. This allows much more to be achieved, especially when analysing X-ray images.

That's especially true for loose and disorganized packaged products such as porridge, pasta or red cabbage. But also for unpackaged bulk goods. The latest HEUFT *reflexx* ^{A.I.} version is now able to reliably detect even the smallest high-density foreign bodies in foodstuffs in which this was previously completely impossible – namely in products which appear very inhomogeneous in the X-ray image, with different

absorbing structures and cavities between the individual components. The latest HEUFT *reflexx* ^{A.I.} version now reliably detects even the smallest high-density foreign objects where this was previously impossible – namely in the case of food products which appear very inhomogeneous in the X-ray image with structures and cavities between the individual components which absorb to varying degrees. The new *deep learning* algorithm of the HEUFT *reflexx* ^{A.I.} image processing system therefore distinguishes aluminium fragments in pickles just as smartly from such harmless deviations as ring-shaped wire in ring-shaped noodles or the little stone in a jar of red cabbage. Products that are actually contaminated are simply detected more clearly and productivity losses, packaging and food waste due to unnecessary false rejections are effectively prevented. HEUFT will be demonstrating how well this works during pulsed X-ray inspection at Stand B-030 / C-031 in Hall 5.2 at Anuga FoodTec 2024. In addition to the compact HEUFT *eXaminer* ^{II} *XS* lateral inspector and the HEUFT *eXaminer* ^{II} *XT* for the inspection of unpackaged product mass in the pipeline, the correspondingly equipped HEUFT *eXaminer* ^{II} *XAC* which now inspects filled jars and cans in a deeper way, for example, will be one of the highlights at the international supplier trade fair for the food industry from March 19th to 22nd in Cologne.

Quality, safety and efficiency: this is what matters when filling and packaging food, beverages and pharmaceuticals! The modular checking, inspecting and labelling systems from HEUFT SYSTEMTECHNIK GMBH put these key factors into practice simply and effectively. They ensure, during maximum productivity, that only perfect products reach the market. Unique camera, X-ray and image processing technologies for a precise empty and full container inspection, trend-setting labelling technology and smart tools for container flow optimisation, production data acquisition and performance analysis safeguard product quality and line efficiency sustainably! A consistent modular design principle with a cross-system control unit for different technologies, procedures and modules generates, together with a high component similarity, the correct automation solution for every application. Those who decide in favour of a user-friendly HEUFT system can depend on a high level of operational reliability. Competent support is always guaranteed with the long-term availability of spare parts and the 24/7 on call service. This concept keeps the globally operating company on a dynamic course of growth. In the meantime the number of employees has long since exceeded the 1,000 mark. Its own locations in 14 different countries and a comprehensive network of service bases on all five continents meet the huge demand for the HEUFT systems which are manufactured exclusively in Germany. The result: more safety, quality and efficiency during the filling and packaging of food, drinks and pharmaceuticals.

HEUFT knows how! heuft.com