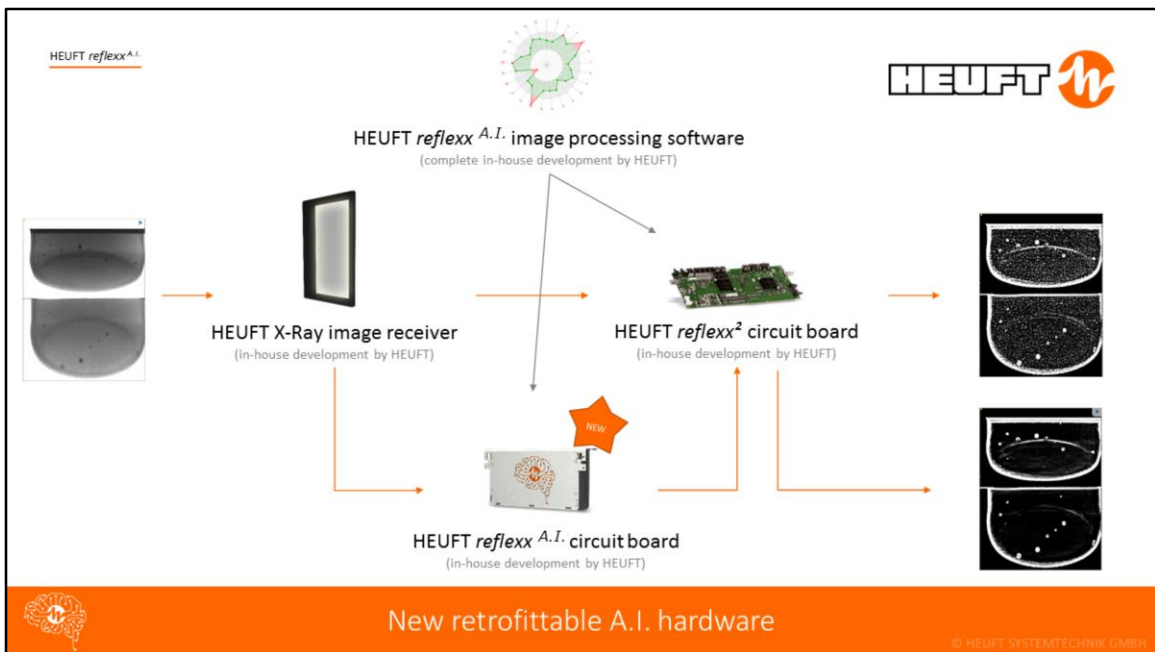
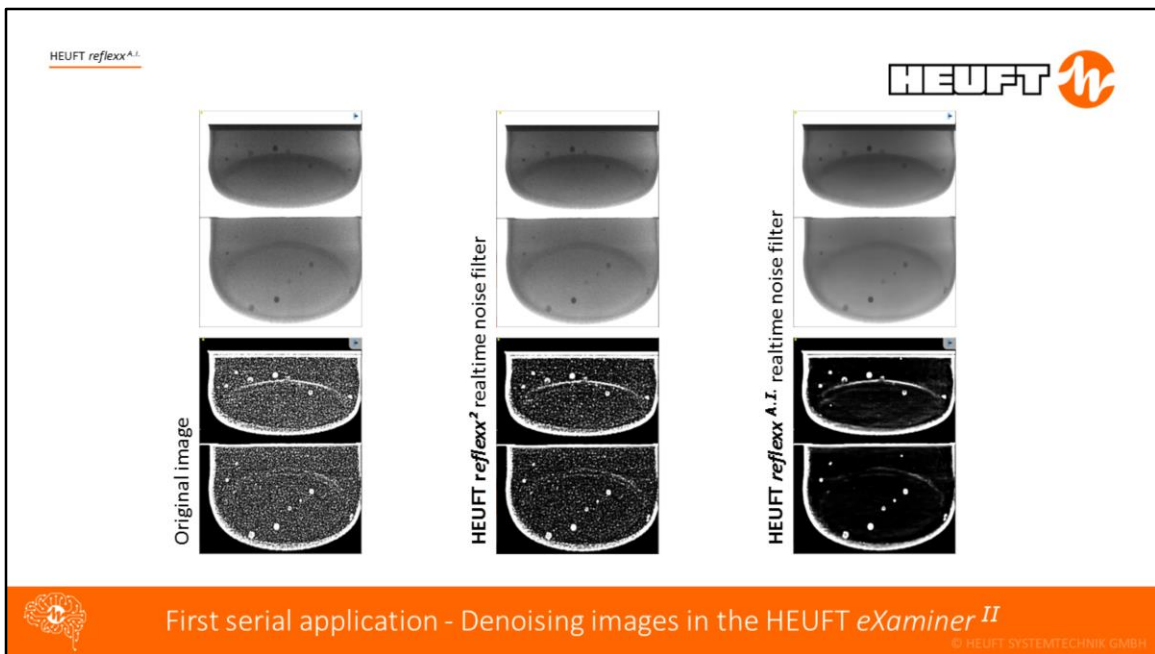


HEUFT *reflexx*^{A.I.}



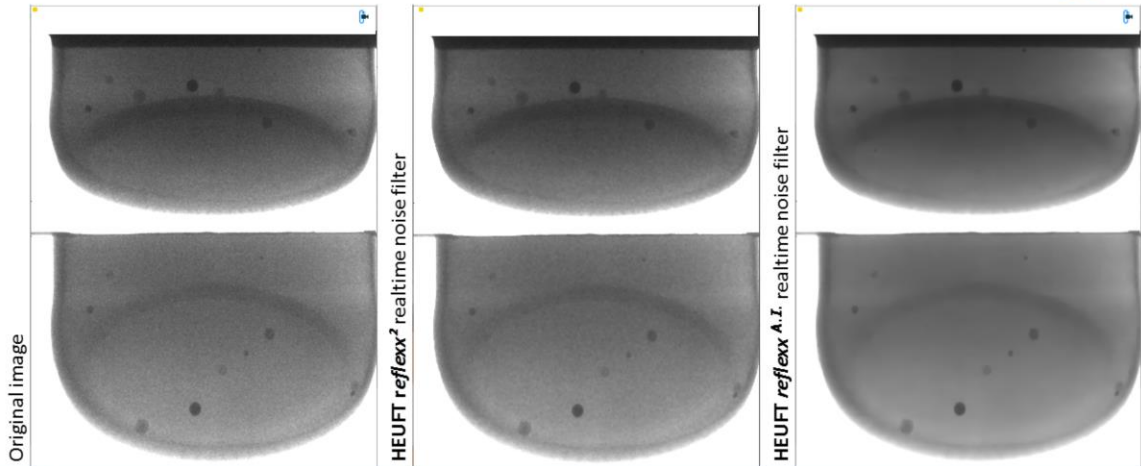


The new HEUFT reflexx A.I. circuit board can be retrofitted in all eXaminer devices with the flat panel x-ray image receiver. It will be plugged in between the image receiver and HEUFT reflexx² circuit board. In this way, we circumvent the problems of the black box problem in neural networks. More detailed information on this topic can be found in the presentation "An overview of artificial intelligence". In contrast to the simple implementation of the competition, the classification of the found objects still takes place in our classifier, which has been developed and tested for over 10 years. As described in the reflexx² presentation, it is possible to understand how objects are classified and, if necessary, the classifier can be adapted quickly and safely. This is not easily possible with neural networks and is a real problem in live operation.



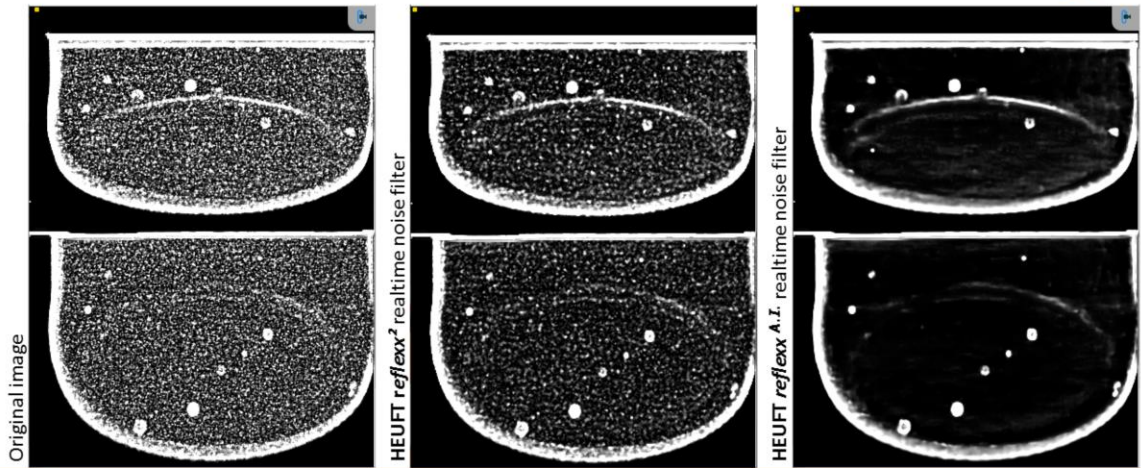
The first serial application ready for production is the denoising of x-ray images. As you can see in the images this new technology means a giant step. The classifier can work on a way clearer image and thus work even more reliable.

This application is already implemented on an eXaminer II XOS at Gerolsteiner (the largest mineral water bottling company in Germany) since 2019 to denoise x-ray inspection images. Tests have shown that, depending on the fault, detection reliability can be increased by up to 10% through the use of AI for denoising. The false rejection rate stayed on the same very low level as before.



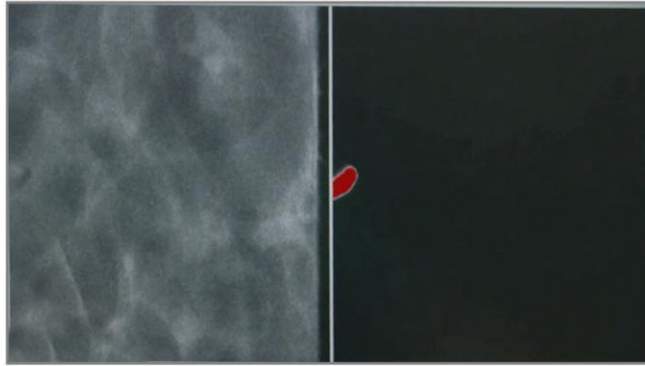
First serial application - Denoising images in the HEUFT *eXaminer II*

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First serial application - Denoising images in the HEUFT *eXaminer II*

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Next serial application – A Game Changer in food inspection

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The next upcoming serial application will be a real game changer in food inspection. In the case of heterogeneous structures in the image, such as those caused by noise and lumpy products, Deep Learning can show its full strength. On the left side of the image you can see an x-ray image of a package of cookies. The contrasts in the image make it hard to detect the fault. HEUFT reflexx A.I. will be capable to remove those structures and leave the fault untouched. On this cleaned image the HEUFT classifier can easily recognize and classify the fault.