

AI: from cats to medical imaging

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Mediso was not an AI company in the past years; it is a medical imaging company developing hardware and software of CT, MR, PET and SPECT modalities. Literature review showed us that neural networks can perform exceptionally well, but the articles focus on technology, and they do not detail real-life use cases about the application of these systems in industry or diagnostics. Apart from developing neural networks, which is not an easy task, the necessary steps to make them safely usable are much more difficult. We not only need to prove the validity of the algorithms, test the methods – as we have seen in the case of traditional software - we have to attack the networks to recognize their limits and capabilities.

In nuclear medicine, some of the most important needs are having shorter examination time and lower amounts of radioisotope. Both of which have serious advantages, but result in decreased image statistics, higher noise levels. Sometimes the smallest features can imply serious medical conditions such as cancer. Therefore, it is not an acceptable option that an AI based noise filter dramatically improves the general image quality of the measurement, but reduces the detectability of a lesion.

We are focusing on artificial intelligence as much as about any new technology. We are using GPUs (CUDA, OpenCL) for reconstruction (e.g. Monte Carlo simulations) software, FPGA-s for signal processing.