Machine learning can make medical images more reliable

January 8 2024, by Ola Nilsson

Credit: Pixabay/CC0 Public Domain

Magnetic resonance imaging (MRI) offers great opportunities when it comes to diagnosing cancer. However, the scanning procedure is extremely sensitive. One of the many problems occurs if the patient

moves ever so slightly during the scan, resulting in a blurry image. This makes it more difficult to accurately determine the size and position of the cancer tumor. However, precision treatment, for example directing radiation so that it attacks the tumor but not the healthy tissue around the tumor, requires precision imaging.

As medical technology improves, however, it also significantly increases the workload of the already overworked medical staff. It can create information stress that can cause delays and errors. More efficient methods for image processing would therefore be a much-needed improvement.

In his dissertation at the Department of Diagnostics and Intervention, Attila Simko shows how to optimize the quality and the efficient processing of MRI images by using machine learning. Attila and his colleagues have developed machine learning models trained to eliminate common artifacts in MRI images, including noise and movement. They have also developed a robust model to create synthetic CT scans from MRI. To further promote their methods, they are all publicly available for researchers for further use and comparisons.

Attila Simko has created a web-based version of his thesis with several interactive figures to help with the understanding of the field.

More information: Thesis: Contributions to deep learning for imaging in radiotherapy

Provided by Umea University

reliable.html