

Advanced Computed Tomography imaging in radiotherapy

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Propositions

Advanced Computed Tomography imaging in radiotherapy

Brent van der Heyden

1. “I rather see pseudo-monoenergetic images as polished single-energy CT scans with additional spatial-frequency filtering.” *this thesis*
2. “A lacking material ground truth is always a weak point in comparison studies dealing with material composition.” *this thesis*
3. “Research is still ongoing to improve the hardware technology of CT or CBCT imaging systems. In my opinion, correction algorithms are technology and platform dependent, and therefore should be only pursued with current technology in mind. If a new technology is developed that avoids the need for a specific correction, then the new technology should be embraced, and its limitations investigated.” *this thesis*
4. “Although AI correction algorithms can generate highly accurate-looking data ... people need to know that they make intermediate decisions on data whose accuracy and performance cannot directly be evaluated by a human observer.” *this thesis*
5. “This work highlighted the great interest of preclinical researchers in automatic segmentation algorithms, but also the need of it.” *Valorization of this thesis*
6. “What deep learning and AI do is mimic the data it’s been trained on. It is in fact possible to train pigeons to mimic and perform as well as human beings on the task of cancer detection in radiologic and pathologic.” *Xing et al. Med Phys 2018 about Levenson et al. PLOS One 2015*
7. “Healthcare, with its abundance of data, is in theory well-poised to benefit from growth in cloud computing.” *Panch et al. NPJ Dig Med 2019*
8. “An expert is a person who has made all the mistakes that can be made in a very narrow field.” *Niels Bohr*
9. “We are stuck with technology when what we really want is just stuff that works.” *Douglas Adams*
10. “From now on we live in a world where man has walked on the Moon. It’s not a miracle; we just decided to go.” *Jim Lovell*
11. “Nevertheless, in 20 years from now, we may very well be looking back at these developments and be amazed at how much additional progress we have made.” *Frédéric Noo and Marc Kachelriess*