

Freek Beekman

Short Biography:

Prof. Freek Beekman leads the Biomedical Imaging section at Delft University of Technology. He has (co-)authored numerous scientific papers and is inventor of > 20 life patent families. He has received multiple awards in acknowledgment of his innovations.

His research spans diverse interests, including detector advancement, PET/SPECT/X-ray CT image reconstruction, hybrid imaging, and AI. He's an associate editor for esteemed journals Biomedical Engineering and IEEE TMI.

In 2006, he founded MILabs, a pioneering company developing high-performance imaging systems. As MILabs' CEO from 2006 to 2021, he orchestrated its successful acquisition by Rigaku in Japan.

Today, systems developed by Prof. Beekman and his collaborative teams at TU Delft and MILabs are vital in global biomedical research institutions, propelling discoveries, tracer development, and pharmaceutical progress.

Abstract:

I will discuss my experience with AI to correct SPECT images, that started already 33 years ago by attempts to correct SPECT for attenuation and scatter using 3D AI based filters. This was followed by developing methods for task dependent noise regularization using supervised training of diffusion filters, in order to optimize SPECT images for a wide range of quantification tasks. More recently we developed AI based attenuation and scatter correction for ultra- high resolution brain SPECT using the full energy spectrum of SPECT scans without having availability of attenuation maps. Additionally, an overview will be given of other (publicly available) cardiovascular segmentation tools and some examples of potential applications of segmentation of the cardiovascular system in PET/CT.