Kuangyu Shi

Short Biography:

Kuangyu Shi is the Chief Medical Physicist, Associate Professor and Head of the Lab for Artificial Intelligence and Translational Theranostics at the Department of Nuclear Medicine, University of Bern, Switzerland. Additionally, he is a senior scientist at the Chair for Computer-aided Medical Procedure, School of Computation, Information & Technology at the Technical University of Munich, Germany. He did his Master and PhD at Max-Planck Institute for Informatics (2003-2008), Germany. Then he moved to Dept. Nuclear Medicine, Technical University of Munich for postdoctoral research and worked as subgroup leader from 2012 to 2018. On May 2018 he completed habilitation at Dept. Informatics, Technical University of Munich. His research focuses on developing artificial intelligence and computational modeling methods for nuclear medicine imaging and therapy and interpreting the results to the underlying pathophysiology by designing corresponding in vivo and ex vivo experiments. His work has been recognized with the young investigator award of the Society of Nuclear Medicine and Molecular Imaging (SNMMI) and the Roger Perez Award of the European Association of Nuclear Medicine (EANM). He is currently a member of the physics committee of EANM, Task Group 36 of the International Commission on Radiological Protection (ICRP), and serves as an associate editor or member of the editorial board of EJNMMI Physics, Eur J Nucl Med Mol Imaging, EJNMMI Research, and Nuklearmedizin.

Abstract:

As the application of Positron Emission Tomography (PET) imaging becomes increasingly prevalent, the associated ionizing radiation burden presents a significant challenge, often constraining its use across a variety of contexts. Traditional efforts to increase the effective sensitivity of PET, such as improvements to detectors or extending the axial field of view, have made considerable strides. Nevertheless, the emergence of Artificial Intelligence (AI) has added a new dimension to these efforts.

This presentation will explore the potential of AI in advancing low-dose PET imaging techniques. A key focus will be the application of AI in the reconstruction from Sinogram space and denoising in imaging space, which could facilitate the generation of high-quality images from low count statistics measurements. Further, the talk will delve into the role of AI in CT-less PET imaging, a concept that may significantly curtail the redundant or unnecessary x-ray doses usually needed for PET attenuation correction. Drawing on our group's recent developments and evaluations, this talk aims to elucidate both the potential benefits and inherent limitations of AI in low-dose PET imaging.