Enhancing PET image quality with deep learning

September 27 2023, by Li Yuan

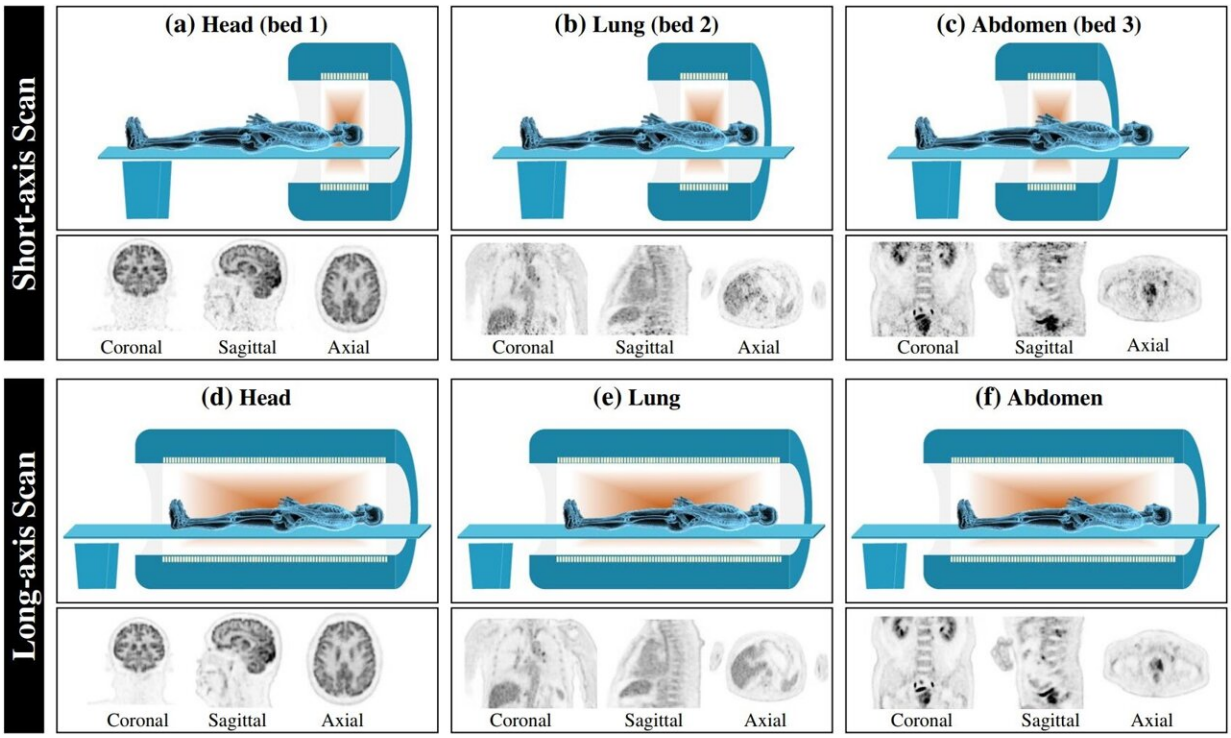

Illustration of long-axis images and short-axis images for head, lung and abdomen. Credit: SIAT

The axial field of view (AFOV) plays a pivotal role in determining image quality in positron emission tomography (PET). While total-body PET scanners like the uEXPLORER offer superior sensitivity, they come at a higher cost and limited accessibility.

Now, a research team led by Prof. Hu Zhanli from the Shenzhen Institute of Advanced Technology (SIAT) of the Chinese Academy of Sciences has proposed a new method to elevate PET image quality, by using deep learning technology to optimize short-axis PET scanner images through high-quality long-axis PET scanner images. The result was published in the *European Journal of Nuclear Medicine and Molecular Imaging* on Sept. 6.

In this study, the researchers used PET images from three anatomical locations (brain, lung, and abdomen) taken from 335 patients. Employing a well-established 3D neural network, they generated short-axis images of comparable quality to long-axis images.

With the proposed approach, superior image quality metrics in all three anatomical locations (peak signal-to-noise ratio exceeded 35 dB, 33 dB, and 38 dB, respectively, with statistical metrics P-values of less than 0.05) were achieved. Moreover, both subjective physician evaluations and quantitative numerical analyses demonstrated the potential of this method to enhance short-axis PET image quality.

This study sheds light on the possibility of using the uEXPLORER PET/CT system to improve short-axis PET image quality, and highlights the potential benefits for patients and radiologists through computer-aided diagnosis systems.

More information: Zhenxing Huang et al, Short-axis PET image quality improvement based on a uEXPLORER total-body PET system through deep learning, *European Journal of Nuclear Medicine and Molecular Imaging* (2023). DOI: 10.1007/s00259-023-06422-x

Provided by Chinese Academy of Sciences

Citation: Enhancing PET image quality with deep learning (2023, September 27) retrieved 3 May 2024 from https://medicalxpress.com/news/2023-09-pet-image-quality-deep.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.