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Auto Single Respiratory Gate by Deep Data Driven Gating for PET

Tech ID: 33984 / UC Case 2023-586-0

ABSTRACT

In PET imaging, patient motion, such as respiratory and cardiac motion, are a major source of blurring and motion artifacts. Researchers at the University of California, Davis have developed a technology designed to enhance PET imaging resolution without the need for external devices by effectively mitigating these artifacts

FULL DESCRIPTION

This technology introduces a novel approach to respiratory gating in positron emission tomography (PET) imaging by utilizing a data-driven gating technique. It leverages unsupervised deep learning to analyze list-mode PET data, divided into short time frames, to identify and extract latent features indicative of respiratory motion. This method eliminates the need for external devices traditionally required for respiratory signal detection, offering a more streamlined and potentially more accurate process for improving PET image resolution.

APPLICATIONS

▶ Improved diagnostic imaging in healthcare, particularly for diseases where PET imaging is essential, such as in oncology.

▶ Research applications in medical imaging technology development.

▶ Integration into existing PET imaging systems to enhance image quality without significant hardware modifications.

FEATURES/BENEFITS

▶ Eliminates the need for external devices to detect and correct for respiratory and cardiac motion signals in PET imaging, simplifying and improving the imaging process.

▶ Utilizes unsupervised deep learning for more accurate patient motion signal extraction and reduction from PET data.

▶ The improved image quality reduces overestimation of lesion volumes and underestimation of lesion activity.

▶ Overcomes the limitations of fixed-phase data-driven gating methods that may not account for irregular motion patterns.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20240225585	07/11/2024	2023-586

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OTHER INFORMATION

KEYWORDS

PET imaging, data-driven gating, deep learning, oncology, medical imaging, motion artifacts reduction

CATEGORIZED AS

▶ **Optics and Photonics**
  ▶ All Optics and Photonics
▶ **Imaging**
  ▶ Medical
  ▶ Molecular
  ▶ Other
  ▶ Software
▶ **Medical**
  ▶ Diagnostics
  ▶ Imaging
  ▶ Other

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