NiftyPET

High-throughput, GPU-accelerated, open-source Python platform for quantitative PET image reconstruction and analysis, especially for hybrid PET/MR data.

https://example.com/1762583716452

Overview

NiftyPET is an open-source Python package for high-throughput Positron Emission Tomography (PET) image reconstruction, manipulation, processing, and quantitative analysis, primarily developed at University College London (UCL).

The platform is specifically engineered for high quantitative accuracy and precision, with a strong emphasis on data acquired using hybrid and simultaneous PET/MR scanners. Its core routines are written in CUDA C and embedded in Python C extensions, enabling efficient, high-throughput execution on NVIDIA Graphics Processing Units (GPUs).

NiftyPET covers the entire processing pipeline, from raw list-mode (LM) PET data through to the final image statistic of interest (e.g., regional SUV). Key capabilities include:

High-Fidelity Correction Models: Accurate attenuation coefficient map generation, fully 3D scatter modelling, and estimation of reduced-variance random events.
Image Processing: Voxel-based Partial Volume Correction (PVC), image manipulation, processing, and registration (via the `nimpa` sub-package).
Uncertainty Estimation: Facilitates voxel-wise estimation of uncertainties of image statistics by enabling LM bootstrapping and multiple independent reconstructions.
While a key application is brain imaging in neurodegeneration (e.g., with amyloid tracers), the software is equally capable for whole-body imaging. It is a powerful tool for scientific research, allowing for the development and validation of new reconstruction and analysis algorithms within a high-performance, open-source framework.

Key Features

- GPU-Accelerated Processing (CUDA C)
- Quantitative PET Image Reconstruction
- Full List-Mode (LM) Data Processing Pipeline

- Voxel-based Partial Volume Correction (PVC)
- Uncertainty Estimation via LM Bootstrapping
- Accurate Attenuation Correction
- Fully 3D Scatter Modelling
- Image Manipulation and Registration

Pricing

Model: free

Open-source, free Python package for scientific research and high-throughput image processing.

Target Company Size: enterprise

Integrations

dcm2niix, NiftyReg