HOCHSCHULE BREMEN
UNIVERSITY OF APPLIED SCIENCES

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Nela Baludu Mekala

Extension of an Open Source Library for Tomographic Image Reconstruction.

ABSTRACT - Masterthesis

A novel Positron Emission Tomography (PET) scanner is being developed at the Central Institute of Engineering, Electronics and Instrumentation (Zentralinstitut für Engineering, Elektronik und Analytik: Systeme der Elektronik (ZEA-2)), Forschungszentrum Jülich, in cooperation with Philips Digital Photon Counting (PDPC), Aachen, for Plant Research. Digital silicon photomultipliers (dSiPM) are being used for the photo detection.

For the reconstruction of the raw data into interpretable images, the open source library STIR (Software for Tomographie Image Reconstruction) is used. As a part of the Master Thesis, STIR libraries are extended according to the proposed scanner (more number of detectors) for the image reconstruction. The proposed scanner is simulated using 'Geant4 (Geometry and Tracking) Application for Tomographic Emission'(GATE) and the ASCII output obtained from GATE is used as the Input to the STIR.