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Decision tree for demultiplexing in Prism-PET

Signal multiplexing is always necessary to decrease a large number of readout channels in PET scanners. Demultiplexing the encoded data with precise channel position and magnitude is significant for medical imaging research. The motivation for this paper is to design an efficient and reliable model for demultiplexing data from Prism-PET detectors. We develop a data-driven method, which incorporates the deterministic light sharing characteristics of Prism-PET and machine learning algorithms to accurately recover the SiPM pixel values. The primary idea is to reconstruct the correct ratio value for each SiPM pixel corresponding to the structured multiplexed pattern of Prism-PET and rebuild the magnitude through multiplexed channel value. The crystals can be clearly separated on the demultiplexed flood histogram, and the predicted energy distributions of crystals are following the same trend as ground truth data.

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

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