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Real-Time Intra-Crystal Scatter Management in PET Imaging Based on Cross-Strip Detectors: An AI-Guided True Line of Response Selection Through FPGA Implementation

Recent technological advancement in nuclear medicine for image-guided radiation therapy and implementation of scanners with extended axial field of view with more detectors and data to be processed encourages real-time data processing where there is no need for all the information to be saved in data acquisition computer for post processing. Addressing this, we are utilizing an artificial neural network to classify the correct line of response (LOR) when there is multiple possibility due to utilizing a cross-strip detectors that leads to ambiguity in selection of anode and cathode pairing to find the accurate first position of interaction. The accuracy of this method is 80% when selecting an accurate LOR among 16 possible LORs. We have implemented this network in a FPGA platform for real-time classification.

Field

Detectors and electronics

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