Glossary

Artificial Intelligence (AI) A broad term to cover the theory and development of computer systems able to perform tasks that normally require human intelligence.

Backpropagation The central mechanism by which deep neural networks can learn. It is the messenger telling the network whether or not the network made a prediction with imperfect results. In the context of learning, backpropagation commonly uses the gradient descent optimization algorithm to adjust the weight of neurons by calculating the gradient of the loss function.

Deep Learning (DL) A subset of machine learning, DL utilizes deep neural networks which consist of layers of mathematical equations and millions of connections and parameters that get trained and strengthened based on the desired output.

Deep Learning Image Reconstruction A CT image reconstruction technique that utilizes deep neural networks to generate CT images.

Deep Neural Network (DNN) An artificial neural network with multiple layers of mathematical equations and millions of connections and parameters that get trained and strengthened based on the desired output.

DLIR-Low/Medium/High Three selectable reconstruction strength levels (Low, Medium, High) to control the amount of noise reduction. Without impacting reconstruction speed, the strength levels are selectable and can be built into reconstruction protocols based on the clinical applications and radiologist preference.

Ground Truth Training Data Refers to millions of CT images reconstructed by FBP that faithfully represent the scanned object, and that are used to train the DLIR engine to generate TrueFidelity CT images.

Inferencing Using the trained neural network in practice. Unlike training, it doesn't include backpropagation to compute the error and update the DNN weights. It takes a network that has already been trained and uses that trained model to perform useful tasks.

Machine Learning (ML) A branch of artificial intelligence based on the idea that systems can learn from data, patterns, and features to make decisions with minimal human intervention.

Mathematical Model Observer Method An objective method to evaluate low contrast detectability, which is recommended by MITA-FDA CT Image Quality Task Group.

Noise Power Spectrum (NPS) A widely used metric for the characterization of noise patterns in CT images. It describes the noise texture within a chosen region-of-interest as a function of spatial frequency.

TrueFidelity Deep Learning Image Reconstruction A GE Healthcare designed, FDA cleared, deep neural network-based CT image reconstruction technology to generate TrueFidelity CT images with outstanding image quality and preferred image noise texture.

TrueFidelity CT Images The commercial name of high-quality CT images generated by GE Healthcare's deep learning image reconstruction engine.