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## Image Quality Assessment Tool for Conventional and Dynamic Magnetic Resonance Imaging Acquisitions

**Abstract:**

IQA is an indispensable part of the diagnostic process; either to ensure adequate diagnostic value of MRI images for conventional diagnosis or to enhance the explainability, traceability and fairness aspects of AI supported diagnostic models. IT has been designed to capture all the different aspects related to image quality and diagnostic value by addressing specific questions to the expert regarding the overall perceived quality of the images, the noise and contrast levels as well as the presence of artifacts. Specific questions taking into account the nature of breast MRI acquisitions are also included, i.e. the presence of surgical clips and the performance of fat saturation pulses. The expert's opinion is the only mandatory part in order to conclude an IQA session before saving the result in a txt file. However, additional features have been developed to assist the expert with quantitative evidence on the slices among a series presenting the weakest quality characteristics, at a glance. These functionalities are No-Reference image quality metrics (BRISQUE and Total Variation score per image) saved as plots per image. For dynamic DCE acquisitions, similarity indices between the different time points provide four graphs that are able to highlight indications of patient motion among different time points. The tool can run as a standalone application or it can be deployed through the freely available Mango tool. In the latter case, more functionalities are available, requiring user interaction: Definition of clinically important ROIs, in order to observe spatial variations in SNR and CNR and calculate a number of statistical metrics that capture the quality characteristics and their spatial variation. The rationale for developing such functionalities are to rise above the constraint or non-medically oriented objective quality metrics.

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**Keywords:** Image Quality Assessment, ROIs : Regions of Interest, SNR: Signal to Noise Ratio, CNR: Contrast to Noise Ratio

**Biography :**
Surgical treatment of hepatobiliary and pancreatic diseases Clinical, basic and translational research on pancreatic diseases (pancreatic cancer, pancreatic neuroendocrine tumors, pancreatic cystic tumors, pancreatitis, minimally invasive pancreatic surgery, islet transplantation, immunotherapy, etc.). Major： General Surgery.

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