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Kalman Filter for Artifact Reduction in MRI Imaging: A Literature Review

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Abstract:

Background: The appearance of Noise Artifacts is admittedly very disturbing the quality of MRI diagnostic images. The application of BLADE and STIR sequences based on artificial intelligence technology has described in reference that it is able to suppress moving signals from the vascular and signals from fat tissue. However, the long consumption of scanning time is one of the drawbacks that arise, and subsequently affect the presence of noise in the image. The use of another technique, namely kallman filter with the Matlab (Matrix Laboratory) program, which is applied as part of post-scanning image processing will help reduce image noise values that arise due to the problem of long scanning time consumption in both sequences. The aim of this literature review is to determine the potential of the filter kalman for the reduction of artifacts on MRI examinations. Methods: The search was conducted using google scholar, WILEY, IEE Explore, SPRINGER, Scopus and PERPUSNAS in English with the article period 2004-2020 using the keywords MRI artifacts, reducing artifacts and the Kalman filter algorithm. Result: The results of a review of 4 articles of kalman filter intervention on MRI Brain, MRI Abdomen and MR Cardiac showed that kalman filter was good enough in reducing artifacts and increasing anatomical information. Conclusion: Kalman filter has the potential to reduce artifacts, improve image quality and clarify anatomical images on MRI examinations.

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