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Design of New Functions Used in the Biomedical and Computational Analysis on Bioimages ANGEL JUNG, DA IN KIM, GUN HA SEO, Choice Research Group — Magnetic Resonance Imaging is a common medical technique that produces an image of the subject's anatomy through radio waves, magnetism and computers. The main purpose of this research is to develop a better algorithm that would not only decrease image production time but also enhance the quality of the final MRI image by minimizing ringing artifact. In Part A, a nonconventional approach is used in MRI image analysis. The original MRI image domain is transformed into k-space using FT, a crucial step to determine the ideal filter. In order to determine such a filter, various filter functions are tested as low pass filters through MATLAB. Some low pass filters significantly reduce the frequency domain data, but at the cost of reduced image quality. However, the optimal low pass filter would reduce frequency data (thus, decreasing production time) without disrupting the resolution of the image. Taking such factors into account, an efficient new filter is proposed and tested with raw data. Part B discusses image reconstruction using raw frequency data and the proposed filters. The proposed filters are applied to multiple k-spaces of the image, which can then be combined using a mathematical function to produce a final image.

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