

Comparison of super resolution methods in magnetic resonance images for small animals

ABSTRACT

Super resolution (SR) is an array of methods that utilize different approaches to enhance the quality and resolution of an image. This is particularly useful for images that are very small and have low quality. Small images are usually obtained due to the limitation of imaging capture systems or the subject captured is small. For small animals such as rats, imaging can be difficult and expensive to produce high-resolution images. Therefore, SR is a very relevant field of study for small animals. The study of small animals involve many impactful fields such as testing of harmful chemicals on the biological processes. The objective of this study is to compare 11 SR methods for rat magnetic resonance images (MRI). This study is a pilot study and the beginning of the research to see the effect of kratom that is a hallucinogen misused in south east Asia. This study used chosen images from six rats. These MRI images were captured at UM MRI Research Centre. This study compared the quality of SR methods using several measures including Peak Sound to Noise Ratio (PSNR), Sound to Noise Ratio (SNR), Mean Square Error (MSE), Structural Similarity Index (SSI). This study compared these methods on two different size factors of resolution which were two and four. The results show promising results for the next stage of research.

Keyword: MRI; Resolution; Small; Enhancement; Image