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# An Overview of Multi-Modal Medical Image Fusion

Jiao Du<sup>a</sup>, Weisheng Li<sup>a\*</sup>, Ke Lu<sup>b</sup>, Bin Xiao<sup>a</sup>

<sup>a</sup>Chongqing Key Laboratory of Computational Intelligence, Chongqing University of Posts and Telecommunications, Chongqing 400065, China

<sup>b</sup>College of Engineering and Information Technology, University of Chinese Academy of Sciences, Beijing 100049, China

## Abstract

Multi-modal medical image fusion is the process of merging multiple images from single or multiple imaging modalities to improve the imaging quality with preserving the specific features.

Medical image fusion covers a broad number of hot topic areas, including image processing, computer vision, pattern recognition, machine learning and artificial intelligence. And medical image fusion has been widely used in clinical for physicians to comprehend the lesion by the fusion of different modalities medical images. In this review, methods in the field of medical image fusion are characterized by (1) image decomposition and image reconstruction, (2) image fusion rules, (3) image quality assessments, and (4) experiments on the benchmark dataset. In addition, this review provides a factual listing of scientific challenges faced in the field of multi-modal medical image fusion.

**Keywords:** multi-modal; image fusion; image decomposition; image reconstruction; image fusion rules; image quality assessment

## I. Introduction

Multi-modal medical image fusion is the combination of multiple images from single or multiple imaging modalities. The purpose of the medical image fusion is to improve imaging quality with preserving the specific features for increasing the clinical applicability of images for diagnosis and assessment of medical problems. Medical image fusion methods cover a broad number of areas, including image processing, computer vision, pattern recognition, machine learning and artificial intelligence with wide applications in clinical for physicians to comprehend the lesion by fusing different modalities medical images [1].

Medical image fusion mainly concentrates on magnetic resonance imaging (MRI), computerized tomography (CT), positron emission tomography (PET) and single-photon emission computed

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