

## Cardiac MRI Segmentation for Heart Function Analysis

**Abstract:** Cardiovascular diseases (CVDs) is a fatal disease worldwide. Cardiac MRI is widely recognized as the most reliable non-invasive imaging technique for assessing cardiac anatomy and function. However, manual segmentation of key structures such as the left ventricle (LV), right ventricle (RV), and myocardium is time-consuming and subject to human variability. This proposal aims to develop an advanced deep learning–based automated system for cardiac MRI segmentation by leveraging hybrid architectures such as U-Net, Attention U-Net, and Transformer-based models (TransUNet). The study focuses on enhancing segmentation accuracy, ensuring robustness across diverse datasets, and achieving real-time diagnostic performance to assist clinicians in the efficient detection and evaluation of cardiac diseases.