

**Title: "Integrating Autoencoders, RNNs, and CNNs for Enhanced Cardiac MRI Analysis via Hybrid Deep Learning: A Multimodal Approach to Precision Diagnostics"**

Dataset Collected By: Md Abu Sufian  
Dataset Documentation: Task02\_Heart

1. Overview

- Title: Task02\_Heart
- Source: Medical Segmentation Decathlon
- Provided by: King's College London, United Kingdom
- Dataset URL: [Medical Segmentation Decathlon](https://decathlon-10.grand-challenge.org/)
- Related Publication: [Nature Article] (<https://www.nature.com/articles/s41467-022-30695-9>)

2. Dataset Description

- Objective: The Task02\_Heart dataset is aimed at facilitating the development and benchmarking of algorithms for heart image analysis, specifically focusing on MRI datasets.
- Applications: This dataset is crucial for advancing research in medical image segmentation, particularly for cardiac imaging and analysis.

3. Image Acquisition

- Modality: MRI (Magnetic Resonance Imaging)
- Scanner: 1.5T Achieva scanner (Philips Healthcare, Best, The Netherlands)
- Voxel Resolution: 1.25 x 1.25 x 2.7 mm<sup>3</sup>
- Acquisition Details: Images were acquired covering the entire heart during a single cardiac phase, involving free breathing with respiratory and ECG gating.

4. Data Contents

- Number of Datasets: 30 MRI datasets
- Segments Included: Left atrium appendage, mitral plane, and portal vein end points.
- Segmentation Method: Initially segmented by an automated tool, followed by expert manual correction.

5. Data Processing

- Format Conversion: Conversion from DICOM to NIfTI (Neuroimaging Informatics Technology Initiative) format for ease of access and interoperability.
- Standardization: Reformatted to ensure consistency across datasets.

6. Data Availability and Licensing

- Download Link: [Download Task02\_Heart Dataset] (<http://medicaldecathlon.com/>)
- License: Creative Commons CC-BY-SA 4.0
- Usage Terms: Data can be shared, redistributed, and improved upon for non-commercial purposes. Proper credit must be given with a citation to the original paper, along with a link to the license and an indication of any changes made.

## 7. Citations and Acknowledgments

- Primary Citation: [Article in Nature] (<https://www.nature.com/articles/s41467-022-30695-9>)
- Dataset Citation: To be cited as provided in the Medical Segmentation Decathlon guidelines.