碩士論文

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# 致謝

# 中文摘要

MMIO 實驗室是一個積極新創、學術實力雄厚的實驗室,擁有世界一流的實驗室與教授。歡迎大家加入MMIO 實驗室。

# Abstract

Abstract.....

Keywords:

Portions of this work have been submitted as a conference abstract. Additionally, large language models (LLMs) and related tools were used to assist in grammar correction throughout this thesis.

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# List of Abbreviations

**AD** Alzheimer's Disease. 5

**CN** cognitive normal. 5

**MCI** mild cognitive impairment. 5

**MMIO** Multimodal Medical Imaging Optimization. iii

**MRI** magnetic resonance imaging. 5

**PET** positron emission tomography. 5

# Chapter 1

# Introduction

The ordered-subsets expectation–maximization (OSEM) algorithm [1] is widely adopted for PET image reconstruction.

# Chapter 2

# Related Works

# Chapter 3

# Materials and Methods

The dataset used in this study consisted of T1-weighted magnetic resonance imaging (MRI) in native space and corresponding [$^{18}$F]-FDG positron emission tomography (PET) data from 50 subjects, obtained from the Alzheimer's Disease Neuroimaging Initiative (ADNI) database (adni.loni.usc.edu). These subjects span three diagnostic categories: cognitive normal (cognitive normal (CN)), mild cognitive impairment (mild cognitive impairment (MCI)), and Alzheimer's disease (Alzheimer's Disease (AD)), with 17, 16, and 17 subjects respectively.

# Chapter 4

# Results

# Chapter 5

# Discussion

# Chapter 6

# Conclusion

# Reference

[1] H. M. Hudson and R. S. Larkin, “Accelerated image reconstruction using ordered subsets of projection data,” *IEEE transactions on medical imaging*, vol. 13, no. 4, pp. 601–609, 1994. 1

# Appendix

## A FreeSurfer Usage

## B Almost Done!

You may feel tired, but you're almost there! Just a little more work to go.