

CONTENTS

APPROVAL	ii
SELF DECLARATION AGAINST PLAGIARISM	iii
ABSTRACT	iv
ABSTRAK	v
DEDICATION	vi
ACKNOWLEDGMENTS	vii
PREFACE	viii
CONTENTS	ix
LIST OF TABLES	xii
LIST OF FIGURES	xiii
1 INTRODUCTION	1
1.1 Rationale	1
1.2 Theoretical Framework	2
1.2.1 Fungi Microorganisms: Their Role and Benefits	2
1.2.2 Deep Learning for Micro fungi Classification	2
1.2.3 Proposed Model : Combination Pretrained ResNet50 and Vision Transformer	3
1.3 Conceptual Framework/Paradigm	3
1.3.1 Variable Identification	3
1.3.2 Discussion of Relationships	3
1.4 Statement of the Problem	4
1.5 Objective and Hypotheses	6
1.5.1 Objective	6
1.5.2 Hypotheses	6
1.6 Scope and Limitation	7
1.6.1 Scope	7
1.6.2 Limitation	7
1.7 Significance of the Study	8

2	REVIEW OF LITERATURE AND STUDIES	10
2.1	Related Literatures	10
2.2	Related Studies	12
2.2.1	Convolutional Neural Network (CNN)	12
2.2.2	ResNet50	13
2.2.3	Transfer Learning	14
2.2.4	Vision Transformer	14
3	RESEARCH METHODOLOGY	16
3.1	Research Design	16
3.2	Load Dataset	17
3.2.1	Data Characteristics	17
3.2.2	Comparison of Morphology Features of Each Genus	21
3.3	Resizing Images	21
3.4	Splitting Data	22
3.5	Preprocessing Data	22
3.6	Proposed Method	23
3.7	Evaluations	25
3.8	Software and Tools Utilized	26
4	PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA	28
4.1	Hyperparameter Initialization	28
4.2	Experiment and Evaluation	29
4.2.1	Baseline Model for Microfungi Image Classification	29
4.2.2	Integrated Model Vision Transformer and pretrained ResNet50 for Microfungi Classification	31
4.2.3	Performance Analysis	35
4.3	Summary of Findings	38
5	CONCLUSION AND RECOMMENDATIONS	41
5.1	Conclusions	41
5.2	Recommendations	41
	BIBLIOGRAPHY	42
	Appendices	46
A	Experiment Log Results	48
A.1	Log Experiment Using Baseline Pretrained ResNet50	48
A.2	Log Experiment Using Baseline Vision Transformer	51
A.3	Log Experiment Using Combination ViT and ResNet50	53

A.4 Accuracy Comparison between ViTRes50 and Baseline Model	67
A.5 Algorithm Modules of the Proposed Method	67
B Curriculum Vitae	72