

Contents

ABSTRACT (CHINESE)	II
ABSTRACT (ENGLISH)	III
CONTENTS	IV
LIST OF FIGURES	VI
LIST OF TABLES	VII
CHAPTER 1 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 AUTOMATIC SPEECH RECOGNITION FOR CAPT	2
1.3 RESEARCH TOPIC	4
1.4 RELATED WORK.....	5
CHAPTER 2 SPEECH SEGMENTATION	7
2.1 ACOUSTIC MODEL TRAINING	7
2.1.1 <i>Speech Corpora</i>	7
2.1.2 <i>Acoustic Model Design</i>	9
2.2 RECOGNITION NETWORK GENERATION	9
2.2.1 <i>Word-Internal and Cross-Word Expansion</i>	9
2.2.2 <i>Pronunciation Confusion Network (PCN)</i>	12
2.3 SPEECH SEGMENTATION & PCN APPROACH.....	13
CHAPTER 3 FORMANT-LEVEL ASSESSMENT	18
3.1 FORMANT AND FORMANT FREQUENCY	18
3.2 RELATION BETWEEN ARTICULATION AND FORMANT	19
3.3 FORMANT NORMALIZATION	20
3.4 FORMANT-BASED HMM	21
3.5 FORMANT-LEVEL ASSESSMENT	23
3.5.1 <i>Derived a GMM for Each Phone Models</i>	23
3.5.2 <i>Ranking process</i>	23
3.5.3 <i>Rank-Based Confidence Measure</i>	24
3.6 FEEDBACK GENERATION	26
CHAPTER 4 EXPERIMENTAL RESULTS	28
4.1 INTRODUCTION	28
4.2 THE CORPORA.....	29

4.2.1	<i>Corpus for Acoustic Model Training</i>	29
4.2.2	<i>Test data for Error Pronunciation Detection</i>	29
4.3	EXPERIMENT 1: RECOGNITION ACCURACY FOR TIMIT	29
4.4	EXPERIMENT 2: PHONETIC SEGMENTATION ACCURACY FOR TIMIT.....	33
4.5	EXPERIMENT 3: RECOGNITION ACCURACY FOR EAT	35
4.6	EXPERIMENT 4: RECOGNITION ACCURACY USING WORD-INTERNAL & CROSS-WORD NETWORK EXPANSION FOR TIMIT, EAT.....	37
4.7	EXPERIMENT 5: DETERMINE THE NUMBER OF MIXTURES FOR GMM USED IN FORMANT-LEVEL ASSESSMENT.....	39
4.8	EXPERIMENT 5: DETERMINE THE THRESHOLD FOR RCM.....	40
CHAPTER 5	CONCLUSIONS & FUTURE WORK	42
	REFERENCE	43

