IT8077 SPEECH PROCESSING

DETAILED SYLLABUS

OBJECTIVES:

- To understand the fundamentals of the speech processing
- Explore the various speech models
- Gather knowledge about the phonetics and pronunciation processing
- Perform wavelet analysis of speech
- To understand the concepts of speech recognition

UNIT I INTRODUCTION

Introduction - knowledge in speech and language processing - ambiguity - models and algorithms - language - thought - understanding - regular expression and automata - words & transducers – N grams

UNIT II SPEECH MODELLING

Word classes and part of speech tagging – hidden markov model – computing likelihood: the forward algorithm – training hidden markov model – maximum entropy model – transformation-based tagging – evaluation and error analysis – issues in part of speech tagging – noisy channel model for spelling

UNIT III SPEECH PRONUNCIATION AND SIGNAL PROCESSING

Phonetics - speech sounds and phonetic transcription - articulatory phonetics - phonological categories and pronunciation variation - acoustic phonetics and signals - phonetic resources - articulatory and gestural phonology

UNIT IV SPEECH IDENTIFICATION

Speech synthesis - text normalization - phonetic analysis - prosodic analysis – diphone waveform synthesis - unit selection waveform synthesis - evaluation

UNIT V SPEECH RECOGNITION

Automatic speech recognition - architecture - applying hidden markov model - feature extraction: mfcc vectors - computing acoustic likelihoods - search and decoding - embedded training - multipass decoding: n-best lists and lattices- a* (stack) decoding - context-dependent acoustic models: triphones - discriminative training - speech recognition by humans

TEXT BOOK:

1. Daniel Jurafsky and James H. Martin, — Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition‖, Person education,2013.

REFERENCES

1.Kai-Fu Lee, —Automatic Speech Recognition‖, The Springer International Series in Engineering and Computer Science, 1999.

2. Himanshu Chaurasiya, —Soft Computing Implementation of Automatic Speech Recognition‖, LAP Lambert Academic Publishing, 2010.

3. Claudio Becchetti, Klucio Prina Ricotti, —Speech Recognition: Theory and C++ implementation‖, Wiley publications 2008.

4. Ikrami Eldirawy, Wesam Ashour, —Visual Speech Recognition‖, Wiley publications, 2011