Department of Computer Science

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING (CSM)

III B. Tech II - Semester

Micro –Syllabus for Natural Language Processing

Unit-I: Introduction to NLP		
Unit	Module	Micro Content
Unit – I	Introduction	1. Welcome
		2. Motivations and Road Map
		3. What is Natural Language Processing
	Language Ambiguity	4. The Problem of Ambiguity and Uncertainty in Languages
		5. The Turing test
		6. NLP Representations in Syntax
	Semantics and Deep Learning Role	7. Semantics and pragmatics
		8. The Applications of NLP
		9. The Role of Deep Learning in NLP
	DL Models and Applications of NLP	10. Deep Learning for NL Computing
Unit-II : Syntactic Parsing		
Unit	Module	Micro Content
Unit-II	Grammar	11. Grammar formalisms
	Tree Banks	12. Tree banks
		13. Tree banks Construction
	Context Free Grammar	14. Context Free Grammars (CFGs)
		15. Efficient parsing for Context Free Grammars (CFGs)
	Probabilistic CFG	16. Probabilistic CFGs(PCFGs)
		17. Statistical Parsing and Probabilistic CFGs(PCFGs)
	Lexical Parsing	18. Lexicalized PCFGs
	Semantic Analysis	19. Semantic Analysis : Lexical Semantics
	Semantic Parsing	20. Word-sense ambiguities
		21. Compositional Semantics
		22. Compositional Semantics
	Sematic Labeling and Parsing	23. Semantic Role Labeling
		24. Semantic Parsing
		25. Semantic Parsing

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Unit-III : N-Gram Language Models		
Unit	Module	Micro Content
Unit-III	N-Gram Model	26. Language Models
		27. Simple N-Gram models
	Parameter Tanning and Optimization	28. Estimating Parameters
		29. Parameter smoothing
		30. Evaluating language models
	POS Tagging and Labeling	31. POS Tagging
		32. POS Tagging Structures and Representations
		33. Sequence Labeling
		34. Lexical Syntax.
	POS Tagging Models	35. Hidden Markov Models
		36. Forward Model
		37. Viterbi Algorithm
		38. EM Training
Unit-IV: Deep Learning for Named Entity Recognition		
Unit	Module	Micro Content
Unit –IV	Deep Learning Parameterization for NER	39. Dependency Parsing
		40. Gradient Checks
	DL Optimization Methods	41. Overfitting
		42. Regularization
		43. Activation Function
		44. Multitask Optimization
		45. Semi Supervised Learning.
	Text Process with Embedding and Converting to Vectorization	46. Text Embedding: Word Vector representation
	Vectorization models	47. Word2vec model
		48. GloVe model
		49. Advanced Word Vector Representations
		50. Sequence-to-Sequence Model
Unit-V: Information Extraction(IE)		
Unit	Module	Micro Content
Unit-V	Named Entity Recognition	51. Named Entity Recognition
		52. Relation Extraction
	Sequence Labeling	53. using Sequence labeling
	Machine Translation	54. Machine Translation(MT):
		55. Basic issues in MT
	Translation Process and Word by word and Phrase by Phrase	56. Statistical translation
		57. Word Alignment
		58. Phrase based Translation

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