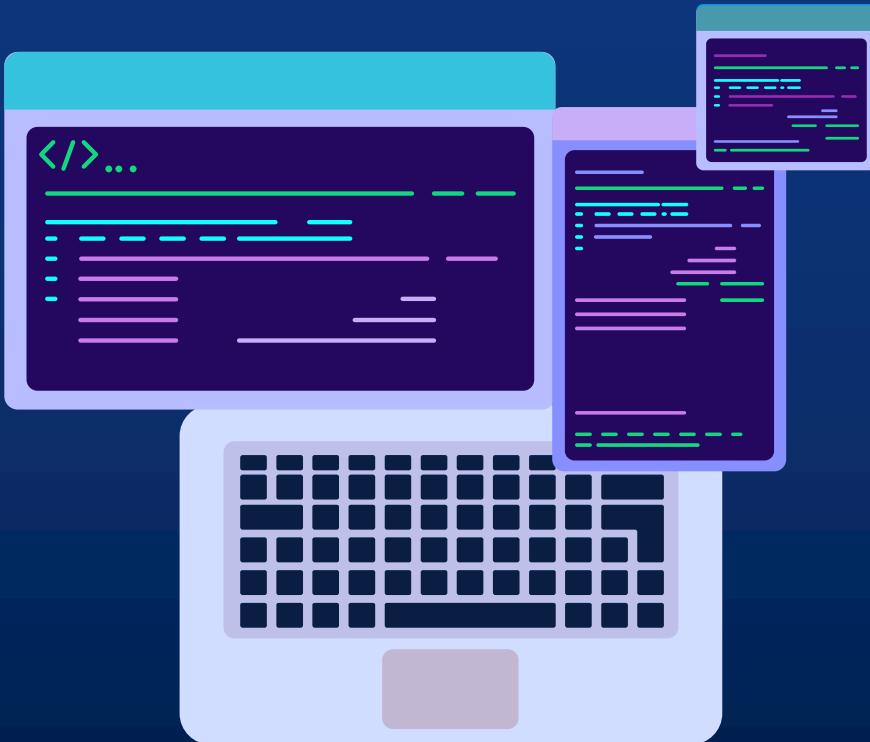


Natural Language Processing

Yue Zhang
Westlake University





Natural Language Processing





COURSE LOGISTICS 课程内容概述

Natural language processing

- A sub field of AI
- On automatic understanding and generation of human languages
- Has evolved since the early days of computer science
- Fast advances with recent development of deep learning technologies
- Machine learning driven
- Growing industry use





COURSE LOGISTICS 课程内容概述

This course

- A comprehensive introduction to Natural Language Processing (NLP)
- Centered on the fundamental machine learning technologies



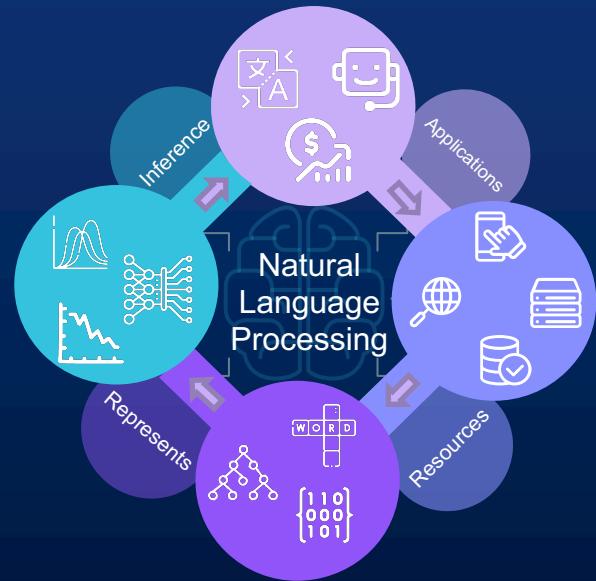
COURSE LOGISTICS 课程内容概述

This course

- A comprehensive introduction to Natural Language Processing (NLP)
- Centered on the fundamental machine learning technologies

Targeted audience

- Senior level undergraduate students
- Graduate students
- Beginning researchers
- AI engineers



FEATURES 课程特点

01

Deep

Teach the machine learning theory behind NLP

02

Broad

Cover all the major models and algorithms

03

Gentle

Details given to reduce difficulty in learning

04

Chronological

Follow the development of the field

05

Unified

Strong connections between different methods

06

Flexible

Different students can select different lessons





COURSE LOGISTICS 课程内容概述

Outline

Part I Basics

- Overview
- Counting frequencies
- Feature vectors
- Unified linear models
- Information theory in NLP
- Hidden variables

Part II Structures

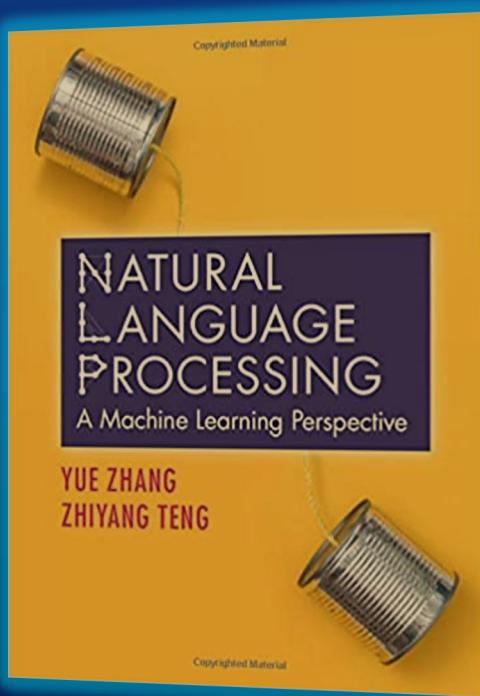
- Generative sequence labeling
- Discriminative sequence labeling

- Sequence segmentation
- Tree structure prediction
- Transition-based methods
- Bayesian learning

Part III Neural network

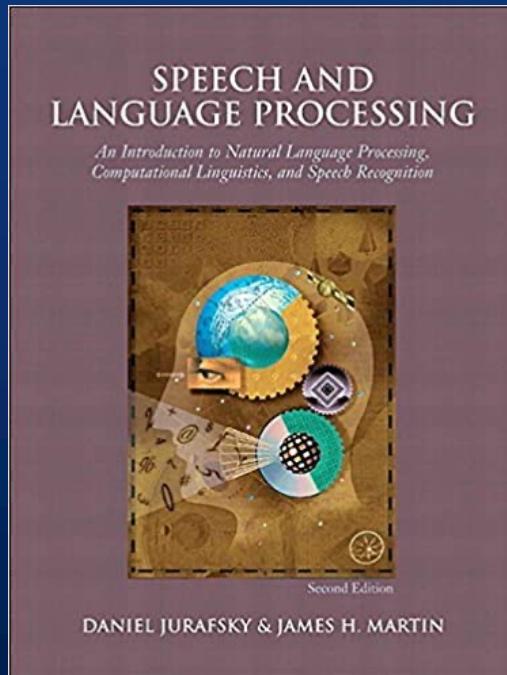
- From one layer to stacked layers
- Representation learning
- Neural structured prediction
- Sequence to sequence learning
- Pre-training and transfer learning
- Deep latent variable models

MAIN TEXTBOOK

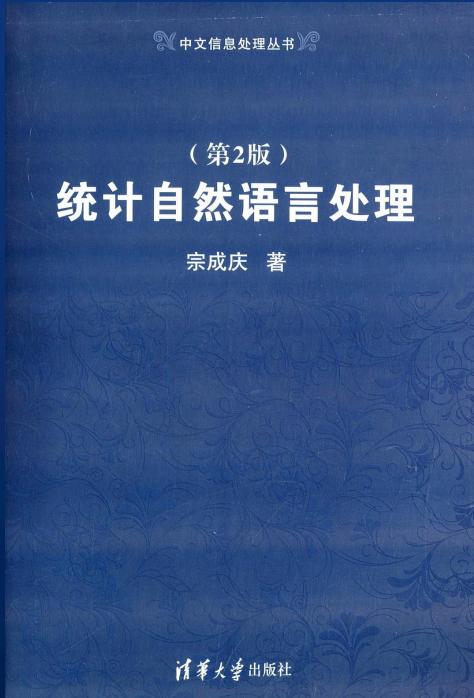


CAMBRIDGE
UNIVERSITY PRESS

REFERENCE TEXTBOOKS



REFERENCE TEXTBOOKS



清华大学出版社
TSINGHUA UNIVERSITY PRESS