Course Introduction

CS4742 Natural Language Processing
Lecture 00

Jiho Noh

Department of Computer Science
Kennesaw State University

CS4742 Summer 2025

About This Course

- Syllabus on D2L

What is Natural Language Processing?

- CNatural Language Processing (NLP) is an interdisciplinary field that studies how to process, analyze, or generate natural language text
  - **Subject:** natural language
  - **Research Tools:** computer science
  - **Modeling Tools:** mathematics, statistics, linguistics
- Realted areas:
  - Computational Linguistics (CL)
  - Language Technology
  - Natural Language Understanding (NLU)
  - Human Language Technology (HLT)

Why Study NLP?

- Centrality of Natural Language
  - A primary (and natural) mode of human communication
  - Representation for most recorded human knowledge
  - A very rich and flexible representation (when compared to most formal representations)
- Language barriers
  - Human-human: Machine Translation
  - Human-computer: NL human machine interfaces, e.g., question answering and chatbots

What does NLP system need?

Knowledge Requirements for NLP

- **Phonetics and Phonology**: Sounds of language, for speech recognition per se.
- **Morphology**: Structure of words, for spelling correction, etc.
- **Syntax**: Structure of sentences for parsing.
- **Semantics**: Meaning of words and sentences.
- **Pragmatics**: Meaning of utterances in context.
- **Discourse**: Meaning of larger units of text, larger than a single utterance.

Why is NLP hard?

- Ambiguity:
  - **Lexical ambiguity**: A word can have multiple meanings (e.g., bank)
  - **Syntactic ambiguity**: A sentence can be parsed in multiple ways
  - "I made her duck"

NLP Applications

- Search engines
- Language translation
- Text summarization
- Classifying text (e.g., Sentiment analysis)
- Question Answering
- Spoken Dialog Systems (e.g., Chatbots)
- Social media analysis
- Information extraction, etc.

1 Introduction to NLP

2 Course Introduction

Course Schedule

- *Course Schedule on Syllabus*

Course Readings

- *Refer to the Syllabus*

Assessment Plan

- *Refer to the Syllabus*

Group Project

This course will be a project-based course. No exams, yay!!

- The final report and presentation will be on the final exam date.

How to Succeed in this Course