IN2361 NLP 2021 Organization

- Lecturer: Prof. Georg Groh, Social Computing Research Group
- Organization: Tobias Eder, Social Computing Research Group
- Format: 4 hours of lecture, no tutorial
- Supplementing for practical skills: summer 2022 NLP lab course (10 ECTS)
- Exam: This year in Person

IN2361 NLP 2021 Organization: Exam

- In person written exam on campus
- Repeat exam before the start of the summer semester
- ~120 minutes, closed book with exception of a cheat sheet
- Slightly overloaded
- Exam cheat sheet:
  - one A4 page (front and back)
    you can write anything you want on your sheet

IN2361 NLP 2021 Organization: Teaching & Learning

- Lecture videos (see link on Moodle) cover the topics, no live lectures
- Slides available, slides contain background readings
- Learning mode: watch videos and read background readings
- Each week: Wednesday, 14:00-15:30: Meeting in BBB rooms (see next slide): we will cooperatively discuss your questions

TUM.LIVE
Live-Streaming & VoD Portal
Technische Universität München

Login

Archiv

WiSe 2019/2020 - Natural Language Processing

- Mi 16.10.2019 14:15 Uhr
- Fr 18.10.2019 14:00 Uhr
- Mi 23.10.2019 14:15 Uhr
- Fr 25.10.2019 14:00 Uhr
- Mi 30.10.2019 14:15 Uhr
- Mi 06.11.2019 14:00 Uhr
- Fr 08.11.2019 14:00 Uhr
- Mi 13.11.2019 14:15 Uhr
- Fr 15.11.2019 14:00 Uhr
- Mi 20.11.2019 14:15 Uhr
- Fr 22.11.2019 14:00 Uhr
- Mi 27.11.2019 14:15 Uhr
- Fr 29.11.2019 14:00 Uhr
- Mi 04.12.2019 14:15 Uhr
- Fr 06.12.2019 14:00 Uhr
- Mi 11.12.2019 14:15 Uhr
- Fr 13.12.2019 14:00 Uhr
- Mi 18.12.2019 14:15 Uhr
- Fr 20.12.2019 14:00 Uhr
- Mi 08.01.2020 14:15 Uhr
- Fr 10.01.2020 14:00 Uhr
- Mi 15.01.2020 14:15 Uhr
- Fr 17.01.2020 14:00 Uhr
- Mi 22.01.2020 14:15 Uhr
- Fr 24.01.2020 14:00 Uhr
- Mi 29.01.2020 14:15 Uhr
- Fr 31.01.2020 14:00 Uhr
- Mi 05.02.2020 14:15 Uhr
- Fr 07.02.2020 14:00 Uhr

IN2361 NLP 2021 Organization: Wednesday meetings: BBB rooms

- We will have one main room and potentially extra rooms of needed:
- Room: https://bbb.in.tum.de/tob-tfd-zss-xxh

Please log on with a microphone. Ask and Answer!
The goal would be a lively discussion!

IN2361 NLP 2021 Organization: Content & Background Reading

- 2_RegExs_TextNormalization_EditDistance
- 3_LanguageModellingWithNGrams
- 4_NaiveBayesAndSentimentClassification
- 5_LogisticRegression
- 6_VectorSemanticsAndEmbeddings
- 7_NeuralNetworksAndNeuralLanguageModels
- 8_PartOfSpeechTagging
- _A_HiddenMarkovModels.pdf
- 12_ConstituencyGrammars
- 13_ConstituencyParsing
- 14_StatisticalConstituencyParsing
- 15_DependencyParsing
- 18_InformationExtraction
- 19_WordSensesAndWordNet
- 20_SemanticRoleLabeling
- 21_LexiconsForSentimentAffectAndConnotation
- 25_QuestionAnswering

Based on:
Dan Jurafsky, James Martin:
Speech and Language Processing,
Oct 16, 2019 Draft version
https://web.stanford.edu/~jurafsky/slp3/

- A_DeepNLP_IntroAndRepetition

Based on:
Yoav Goldberg:
A Primer on Neural Network Models for Natural Language Processing
https://arxiv.org/abs/1510.00726

- B_07_08_09_DeepNLP_SimpleExamples
- C_10_DeepNLP_MT_Seq2Seq_Attention
- D_11_DeepNLP_AdvancedAttention
- E_12_DeepNLP_TransformerNetworksAndCNN
- F_13_DeepNLP_coReferenceResolution
- G_new_BERTandContextualEmbeddings

Roughly based on:
Chris Manning, Richard Socher et al.:
CS224n: Natural Language Processing with Deep Learning
Slides & Background readings
http://web.stanford.edu/class/cs224n/

IN2361 NLP 2021 Organization: Content & Background Reading

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CS224n: Natural Language Processing with Deep Learning
Slides & Background readings
http://web.stanford.edu/class/cs224n/

There might be some changes towards the end of the semester with extra material coming. This will also be announced on moodle.

IN2361 NLP 2021 Organization:
Learning Rhythm: Times & Topics for Q&A-Sessions

- 2_RegExs_TextNormalization_EditDistance
- 3_LanguageModellingWithNGrams

} WS 20/21: Watch & read in week 1, Oct 18-24 → Q&A Meeting in week 2

- 4_NaiveBayesAndSentimentClassification
- 5_LogisticRegression

} WS 20/21: Watch & read in week 2, Oct 25-31 → Q&A Meeting in week 3

- 6_VectorSemanticsAndEmbeddings
- 7_NeuralNetworksAndNeuralLanguageModels

} WS 20/21: Watch & read in week 3, Nov 1-7 → Q&A Meeting in week 4

- 8_PartOfSpeechTagging
- _A_HiddenMarkovModels.pdf

} WS 20/21: Watch & read in week 4, Nov 8-14 → Q&A Meeting in week 5

- 12_ConstituencyGrammars
- 13_ConstituencyParsing

} WS 20/21: Watch & read in week 5, Nov 15-21 → Q&A Meeting in week 6

- 14_StatisticalConstituencyParsing
- 15_DependencyParsing

} WS 20/21: Watch & read in week 6, Nov 22-28 → Q&A Meeting in week 7

- 18_InformationExtraction
- 19_WordSensesAndWordNet

} WS 20/21: Watch & read in week 7, Nov 29-Dec 05 → Q&A Meeting in week 8

- 20_SemanticRoleLabeling
- 21_LexiconsForSentimentAffectAndConnotation
- 25_QuestionAnswering

} WS 20/21: Watch & read in week 8, Dec 06-12 → Q&A Meeting in week 9

- A_DeepNLP_IntroAndRepetition

} WS 20/21: Watch & read over Christmas→ Q&A Meeting in **week 11 (Jan 10-16)**

- B_07_08_09_DeepNLP_SimpleExamples
- C_10_DeepNLP_MT_Seq2Seq_Attention

} WS 20/21: Watch & read in week 11, Jan 10-16 → Q&A Meeting in week 12

- D_11_DeepNLP_AdvancedAttention
- E_12_DeepNLP_TransformerNetworksAndCNN

} WS 20/21: Watch & read in week 12, Jan 17-23 → Q&A Meeting in week 13

- F_13_DeepNLP_coReferenceResolution
- G_new_BERTandContextualEmbeddings

} **New material** in week 13 and 14, Jan 24-Feb 06 → Q&A Meeting in week 14

IN2361 NLP 2021 Organization:
Learning Rhythm: Lecture Recording Guide

- 2_RegExs_TextNormalization_EditDistance
- 3_LanguageModellingWithNGrams

Chapter 2: Mi 16.10.2019
Chapter 3: Fr 18.10.2019 + Start of Mi 23.10.2019 (end: 20:52)

- 4_NaiveBayesAndSentimentClassification
- 5_LogisticRegression

Chapter 4: Mi 23.10.2019 (start: 20:52) + Fr 25.10.2019 (e: 44:15)
Chapter 5: Fr 25.10.2019 (s: 44:15)

- 6_VectorSemanticsAndEmbeddings
- 7_NeuralNetworksAndNeuralLanguageModels

Chapter 6: Mi 30.10.2019 + Fr 06.11.2019 (e: 54:16)
Chapter 7: Fr 06.11.2019 (s: 54:16 – e: 1:17:30)

- 8_PartOfSpeechTagging
- _A_HiddenMarkovModels.pdf

Chapter 8: Fr 06.11.2019 (s: 1:17:30) + Fr 08.11.2019 (e: 20:30) +
Mi 13.11.2019 (s: 39:00 – e: 1:22:50)
Appendix A : Fr 08.11.2019 (s: 20:30) + Mi 13.11.2019 (e: 39:00)

- 12_ConstituencyGrammars
- 13_ConstituencyParsing

Chapter 12: Mi 13.11.2019 (s: 1:22:50) + Fr 15.11.2019 + Mi 20.11.2019 (e: 26:48)
Chapter 13: Mi 20.11.2019 (s: 26:48 – e: 1:08:00)

- 14_StatisticalConstituencyParsing
- 15_DependencyParsing

Chapter 14: Mi 20.11.2019 (s: 1:08:00) + Fr 22.11.2019 + Mi 27.11.2019 (e: 45:00)
Chapter 15: Mi 27.11.2019 (s: 45:00) + Fr 29.11.2019 (e: 1:00:50)

- 18_InformationExtraction
- 19_WordSensesAndWordNet

Chapter 18: Fr 29.11.2019 (s: 1:00:50) + Mi 04.12.2019
Chapter 19: Fr 06.12.2019 (e: 1:45:42)

- 20_SemanticRoleLabeling
- 21_LexiconsForSentimentAffectAndConnotation
- 25_QuestionAnswering

Chapter 20: Fr 06.12.2019 (s: 1:45:42) + Mi 11.12.2019
Chapter 21: Mi 18.12.2019
Chapter 25: Fr 20.12.2019

- A_DeepNLP_IntroAndRepetition

Part A: Mi 08.01.2020 + Fr 10.01.2020 + Mi 15.01.2020 + Fr 17.01.2020 (e: 52:45)

- B_07_08_09_DeepNLP_SimpleExamples
- C_10_DeepNLP_MT_Seq2Seq_Attention

Part B: Fr 17.01.2020 (s: 52:45 – 1:28:59)
Part C: Fr 17.01.2020 (s: 1:28:59) + Mi 22.01.2020 (e: 51:11)

- D_11_DeepNLP_AdvancedAttention
- E_12_DeepNLP_TransformerNetworksAndCNN

Part D: Mi 22.01.2020 (s: 51:11) + Fr 24.01.2020 (e: 1:08:48)
Part E: Fr 24.01.2020 (s: 1:08:49) + Mi 29.01.2020 (e: 48:13)

Speech and Language Processing (3rd ed. draft)

Dan Jurafsky and James H. Martin

2020 August: We're finally back to our regular summer writing on the textbook!

What we're busily writing right now: new versions of Chapter 8 (bringing together POS and NER in one chapter), Chapters 9 (with transformers) and 10 (BERT) and (finally) the MT chapter (11)!

Plus a modernizing pass (and typo fixing, thanks to all of you!!!) on all the other chapters.

We'll update them here when they are ready, and then figure out what's next.

When will the whole book be finished? Well, we're shooting for the end of 2020 for finishing the writing, but we'll see.

Last year's draft status, October 16, 2019

Last fall's updates include new chapters 10, 22, 23, 27, significantly rewritten versions of Chapters 9, 19, and 26, and a pass on all the other chapters with modern updates and fixes for the many typos and suggesti
our loyal readers!

Thanks so much to all of you for the help! We are really really grateful!!!

Individual chapters are below; here is a single pdf of all the chapters in the oct 16, 2019 draft of the book-so-far

As always, typos and comments very welcome (just email slp3edbugs@gmail.com and let us know the date on the draft)!
And feel free to use the draft slides in your classes.

(Due to reorganizing, still expect random chapter numbers and missing latex chapter and section crossrefs in the pdfs)

	Chapter	Slides	Relation to 2nd ed.
1:	Introduction		[Ch. 1 in 2nd ed.]
2:	Regular Expressions, Text Normalization, and Edit Distance	Text [pptx] [pdf] Edit Distance [pptx] [pdf]	[Ch. 2 and parts of Ch. 3 in 2nd ed.]
3:	Language Modeling with N-Grams	LM [pptx] [pdf]	[Ch. 4 in 2nd ed.]
4:	Naive Bayes Classification and Sentiment	NB [pptx] [pdf] Sentiment [pptx] [pdf]	[new in this edition]
5:	Logistic Regression		
6:	Vector Semantics and Embeddings	Vector1 [pptx] [pdf] Vector2 [pptx] [pdf]	
7:	Neural Nets and Neural Language Models		[new in this edition]
8:	Part-of-Speech Tagging		[Ch. 5 in 2nd ed.]
9:	Sequence Processing with Recurrent Networks		[new in this edition]
10:	Encoder-Decoder Models, Attention, and Contextual Embeddings		[new in this edition]
11:	Machine Translation		
12:	Constituency Grammars		[Ch. 12 in 2nd ed.]
13:	Constituency Parsing		[Ch. 13 in 2nd ed.]
14:	Statistical Constituency Parsing		[Ch. 14 in 2nd ed.]
15:	Dependency Parsing		[new in this edition]
16:	Logical Representations of Sentence Meaning		
17:	Computational Semantics and Semantic Parsing		
18:	Information Extraction		[Ch. 22 in 2nd ed.]
19:	Word Senses and WordNet		
20:	Semantic Role Labeling and Argument Structure	SRL [pptx] [pdf] Select [pptx] [pdf]	[expanded from parts of Ch. 19, 20 in 2nd ed]
21:	Lexicons for Sentiment, Affect, and Connotation	SentLex [pptx] [pdf]	[new in this edition]
22:	Coreference Resolution		[expanded from parts of Ch 21 in 2nd ed]

CS224n: Natural Language Processing with Deep Learning

Stanford / Winter 2020

Natural language processing (NLP) is a crucial part of artificial intelligence (AI), modeling how people share information. In recent years, deep learning approaches have obtained very high performance on many NLP tasks. In this course, students gain a thorough introduction to cutting-edge neural networks for NLP.

Logistics

- **Lectures:** are on Tuesday/Thursday 4:30-5:50pm Pacific Time in NVIDIA Auditorium.
- **Lecture videos for enrolled students:** are posted on Canvas (requires login) shortly after each lecture ends. Unfortunately, it is not possible to make these videos viewable by non-enrolled students.
- **Publicly available lecture videos and versions of the course:** Complete videos from the 2019 edition are available (free!) on the Stanford Online Hub and on the CS224N YouTube channel. Anyone is welcome to enroll in XCS224N: Natural Language Processing with Deep Learning, the Stanford Artificial Intelligence Professional Program version of this course, throughout the year (medium fee, community TAs and certificate). You can enroll in CS224N via Stanford online in the (northern hemisphere) Autumn to do the course in the Winter (high cost, gives Stanford credit). The lecture slides and assignments are updated online each year as the course progresses. We are happy for anyone to use these resources, but we are happy to get acknowledgements.
- **Office hours**: Information here.
- **Contact**: Students should ask *all* course-related questions in the Piazza forum, where you will also find announcements. For external enquiries, emergencies, or personal matters that you don't wish to put in a private Piazza post, you can email us at *cs224n-win1920-staff@lists.stanford.edu.*
- **Sitting in on lectures**: In general we are happy for guests to sit-in on lectures if they are a member of the Stanford community (registered student, staff, and/or faculty). If the class is too full and we're running out of space, we ask that you please allow registered students to attend. Due to high enrollment, we cannot grade the work of any students who are not officially enrolled in the class.
- **Academic accommodations**: If you need an academic accommodation based on a disability, you should initiate the request with the Office of Accessible Education (OAE). The OAE will evaluate the request, recommend accommodations, and prepare a letter for faculty. Students should contact the OAE as soon as possible and at any rate in advance of assignment deadlines, since timely notice is needed to coordinate accommodations.

Instructors


Chris Manning


Matthew Lamm
Head TA

Course Coordinator

Teaching Assistants


Arnaud Autef


Emma Chen


Prerna Dhareshwar


John Hewitt


Nicholas Hirning


Haoshen Hong


Hang Jiang


Amita Kamath


Kush Khosla


Mina Lee

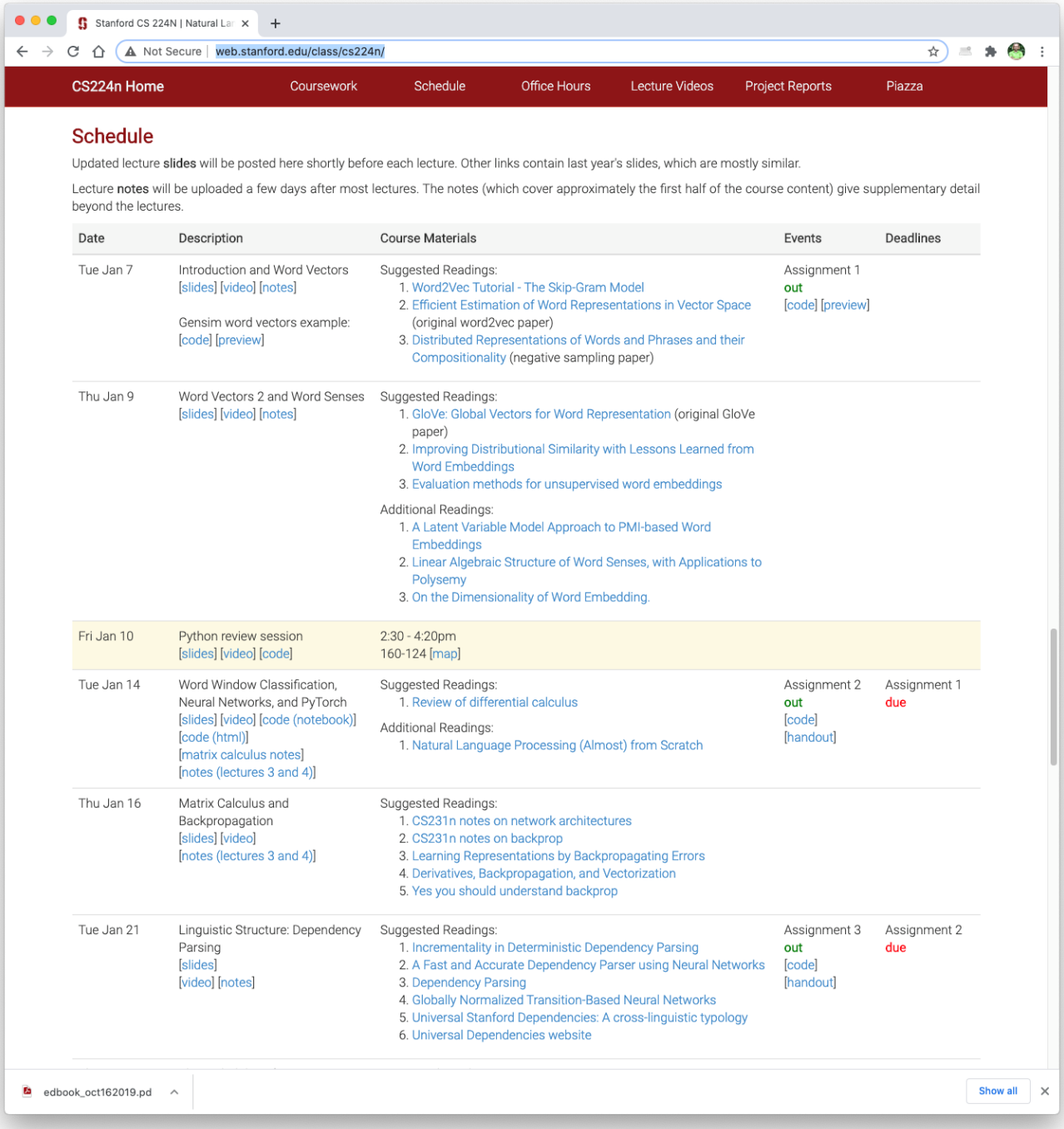

Peiyu (Rachel) Liao


Vera Lin


Cecilia Liu


Mandy Lu


Alexandre Matton



Schedule

Updated lecture **slides** will be posted here shortly before each lecture. Other links contain last year's slides, which are mostly similar.

Lecture **notes** will be uploaded a few days after most lectures. The notes (which cover approximately the first half of the course content) give supplementary detail beyond the lectures.

Date	Description	Course Materials	Events	Deadlines
Tue Jan 7	Introduction and Word Vectors [slides] [video] [notes] Gensim word vectors example: [code] [preview]	Suggested Readings: 1. Word2Vec Tutorial - The Skip-Gram Model 2. Efficient Estimation of Word Representations in Vector Space (original word2vec paper) 3. Distributed Representations of Words and Phrases and their Compositionality (negative sampling paper)	Assignment 1 out [code] [preview]	
Thu Jan 9	Word Vectors 2 and Word Senses [slides] [video] [notes]	Suggested Readings: 1. GloVe: Global Vectors for Word Representation (original GloVe paper) 2. Improving Distributional Similarity with Lessons Learned from Word Embeddings 3. Evaluation methods for unsupervised word embeddings Additional Readings: 1. A Latent Variable Model Approach to PMI-based Word Embeddings 2. Linear Algebraic Structure of Word Senses, with Applications to Polysemy 3. On the Dimensionality of Word Embedding.		
Fri Jan 10	Python review session [slides] [video] [code]	2:30 - 4:20pm 160-124 [map]		
Tue Jan 14	Word Window Classification, Neural Networks, and PyTorch [slides] [video] [code (notebook)] [code (html)] [matrix calculus notes] [notes (lectures 3 and 4)]	Suggested Readings: 1. Review of differential calculus Additional Readings: 1. Natural Language Processing (Almost) from Scratch	Assignment 2 out [code] [handout]	Assignment 1 due
Thu Jan 16	Matrix Calculus and Backpropagation [slides] [video] [notes (lectures 3 and 4)]	Suggested Readings: 1. CS231n notes on network architectures 2. CS231n notes on backprop 3. Learning Representations by Backpropagating Errors 4. Derivatives, Backpropagation, and Vectorization 5. Yes you should understand backprop		
Tue Jan 21	Linguistic Structure: Dependency Parsing [slides] [video] [notes]	Suggested Readings: 1. Incrementality in Deterministic Dependency Parsing 2. A Fast and Accurate Dependency Parser using Neural Networks 3. Dependency Parsing 4. Globally Normalized Transition-Based Neural Networks 5. Universal Stanford Dependencies: A cross-linguistic typology 6. Universal Dependencies website	Assignment 3 out [code] [handout]	Assignment 2 due