

# Final Exam Details

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Lexicon, Syntax, Semantics IIb: Modeling Meaning

July 16/23, 2020

## 1 Details and Organization

The final exam consists of a 30-minute oral presentation on an agreed-upon topic covered in, or pertinent to, the material covered throughout the course. The 30-minute presentation will be followed by a 10-minute space reserved for follow-up questions by myself and other students.

**Content of presentation.** The presentation should be a general and critical overview of relevant literature/research on the selected topic. You are expected to cover the **theoretical** aspects of your topic (background, motivation, theoretical implications, etc.) as well as a **practical** study (reimplementation of a system, detailed analysis of results, application of an approach to a new dataset/problem, etc.).

**Choosing your topic.** Each student will select their topic, either from the list provided below or something else approved by me. *Email me your topic choice by **May 22nd** ([evamariavecchi@gmail.com](mailto:evamariavecchi@gmail.com)).*

**Literature and research material selection.** Once you have selected your topic, you are expected to select 1-3 pieces of literature (articles, chapters, etc.) which you will review and which will drive your practical study. The selection of material can be done alone (with approval by me once you've selected the material) or it can be discussed with me. *The selection of literature and research material must be approved and finalized by **June 5th**.*

**Practical study** Each student will implement a practical study relevant to the research discussed in the selected literature and the selected topic. The type of study can vary, including (but not limited to) reimplementation of a system, detailed analysis of results, application of an approach to a new dataset/problem/language, comparative analysis of parameters or embedding types for a task, etc. As with the choice of material, the practical study must be approved by me. *Please submit a summary of the practical study you intend to implement along with your topic choice by **June 17th**.*

**Scheduling.** The exam dates are July 16th and July 23rd. I will post a schedule once the topics have been selected. **\*\*Note:** All students are expected to attend class both days - there will be a lot to learn from the presentations and you are expected to support the effort of your peers.

## 2 Proposed Topics

### 1. Lexical Semantics

- (a) Computational approaches to word meaning
- (b) Lexical relations in computational tasks

### 2. Formal Semantics

- (a) Model-Theoretic semantic spaces
- (b) Entailment in computational semantics

### 3. Cognitive Semantics

- (a) Feature norms and Conceptual semantic spaces
- (b) Metaphor in NLP
- (c) Modeling Concrete vs. Abstract Concepts

### 4. Distributional Semantics

- (a) Applications and evaluation of DS Models
- (b) Approximation of human judgments
- (c) Multi-modal semantic models (also as topic in Machine Learning)

**5. Compositional Distributional Semantics**

- (a) Applications of CDS Models
- (b) Composition functions: performance and implications for syntax, word order, semantic creativity, etc
- (c) Morphology and CDS
- (d) Multi-word expressions and non-compositionality

**6. Machine Learning for Modeling Meaning**

- (a) Improving word representations with recursive neural networks
- (b) Morphological smoothing and extrapolation of word embeddings
- (c) Approaches to de-bias word embeddings

**7. Other**