Introduction to Formal Semantics

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Saarland University

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Overview for today

- Formalities
- Historical background
- Defining semantics
- Course topics

Formalities

Format: Mo 10:15 – 11:45 (Lecture), We 08:30 – 10:00 (Exercise), EN

Exam:

- 120 minutes, 18.07.2022
- important: do not forget to register till 11.07.2022 (and then also to re-sit the exam)
- Re-exam: beginning WiSe 2022/2023

Weekly exercises:

- **deadline Tuesday 4pm (16:00)**
- to `nddascalu@lsv.uni-saarland.de` in **PDF**
- please put the subject tag **[IDF2022:Exercise_NRX]**

Reading: 'Must Read' + background Reading

Questions: E-Mail, Teams or office hours (C7.1 room 0.16): Mo 2-3pm

Homepage

```
https:
//www.lsv.uni-saarland.de/upcoming-courses/einfuhrung-in-die-formale
-semantik-introduction-into-formal-semantics-summer-2022/
```
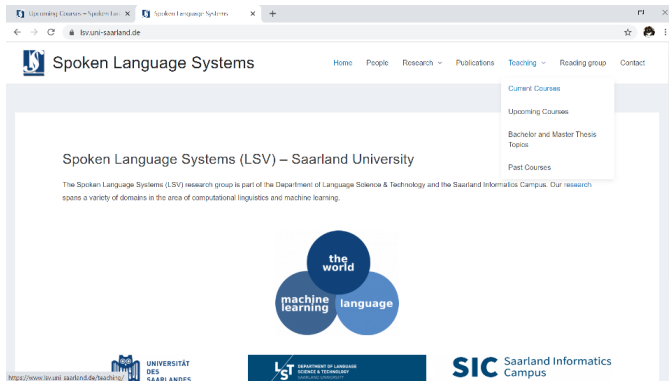
Mail list & TEAM work

created …

- ifs_2022@lsv.uni-saarland.de
- home work and corrections to homework
- personal questions/clarifications

TEAMS

- `created,seecoursepageandjoin`
- course material: slides & assignments
- group discussions
- ask questions to other students

Textbooks

Suggested basic reading

… there are many out there

- **Basic** Coppock, E., & Champollion, L. (2021). Invitation to formal semantics. Manuscript, Boston University and New York University. `https://eecoppock.info/bootcamp/semantics-boot-camp.pdf`

- **Additional** Winter, Y. (2016). Elements of formal semantics: An introduction to the mathematical theory of meaning in natural language. Edinburgh University Press.

Additional readings will be handed out or made accessible via the TEAMS

Homeworks and Quizzes

Homeworks

- expect 10 homework assignments: longer and more in-depth in nature

Quizzes

- lecture finishes 15 minutes earlier
- do it during the last 15 minutes of class
- hand it in right away

Homework Policy

- you can discuss the assignment with your classmates, but you must write it up and submit on your own;
- if you use other sources, e.g. from the web, texts or someone else, it is not only good form to do so but you must cite them;
- there is no penalty for mentioning your sources – do not cheat or plagiarize!
- homeworks will be discussed in detail in Tutorials - a good chance to ask informational and clarification questions.

Homework Policy

Homeworks are due one week from the assignment

- submit by email (to Nicolaie) by Tuesday 16:00 before Tutorial, subject tag [IDF2022:Exercise_NRX]
- Please attempt homeworks early! Avoid the stress of last-minute emails!

Grading

- final exam: 8 questions $=$ 80 points
- homeworks will be worth 15 points
- quizzes will be worth 5 points
- FINAL GRADE based on an objective formula:
  $score = final + homeworks + quizzes$
- if you skip a homework, we cannot give you an 1.0

Informalities

Please do:

- ask when you have questions (in German or English)
- say something right away if I'm speaking too quickly or if there are words you don't know or understand
- be present when you are present

Please don't:

- stay away because you're late (just enter quietly)

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Computational semantics is the art and science of computing meanings for the expressions of a natural language

The formal study of natural language

1916 **Ferdinand de Saussure** proposes that natural language may be analyzed as a formal system.

1957 **Noam Chomsky** proposes to define natural languages as sets of grammatical sentences, and to study their structure with formal means.

- The ability of language users to recognize members of this set is called competence.
- Goal: build a model of our linguistic knowledge, abstracting from language performance (speech disabilities, memory limitations, errors, etc). Such a model is called grammar

1970 **Richard Montague** proposes to extend the Chomskyan program to semantics and pragmatics.

The birth of formal semantics

There is in my opinion no important theoretical difference between natural languages and the artificial languages of logicians; indeed, I consider it possible to comprehend the syntax and semantics of both kinds of languages within a single natural and mathematically precise theory.

(Richard Montague, 1930 –1971)

this allows for a relatively straightforward implementation

In fact, when we describe grammars of fragments of natural languages in a formal way, we are doing the same as when describing formal languages.

Organization of grammar

- **Phonology** investigates the smallest meaning-distinguishing units (speech sounds) and how they are combined into the smallest meaning-carrying units (morphemes).
- **Morphology** is concerned with how morphemes are combined into words.
- **Syntax** studies how words are combined into phrases and sentences.
- **Semantics** investigates the meanings of words, phrases and sentences, and how the meaning of a complex expression can be constructed from the meanings of its parts.

Our focus

We will concentrate on meaning and form at the level of phrases and sentences, i.e. start with words as basic building blocks.

Example
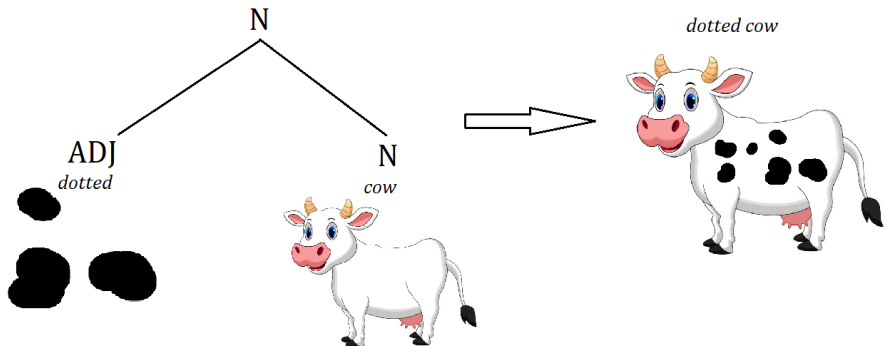
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Example
Lincoln was assassinated entails Lincoln is dead

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Example
rubber duck vs rubber chicken
kick the bucket

Course topics

1. Form and Meaning
2. Inference
3. Predication and Argumentation
4. Simple Meaning Composition
5. Typed Lambda Calculus
6. Function Application and Beyond
7. Event Semantics
8. Modal and Temporal Semantics
9. Intensional Semantics

Quizz 1 for Today

Please write down and hand over to me:

- Name:
- Contact email:
- Matrikelnummer:
- Year/Semester: