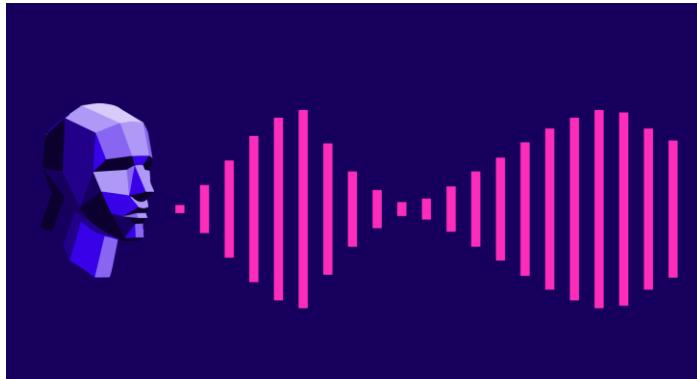
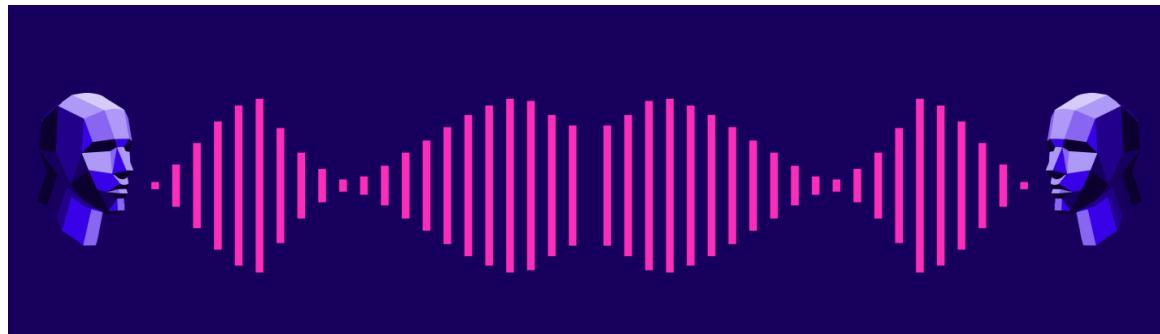


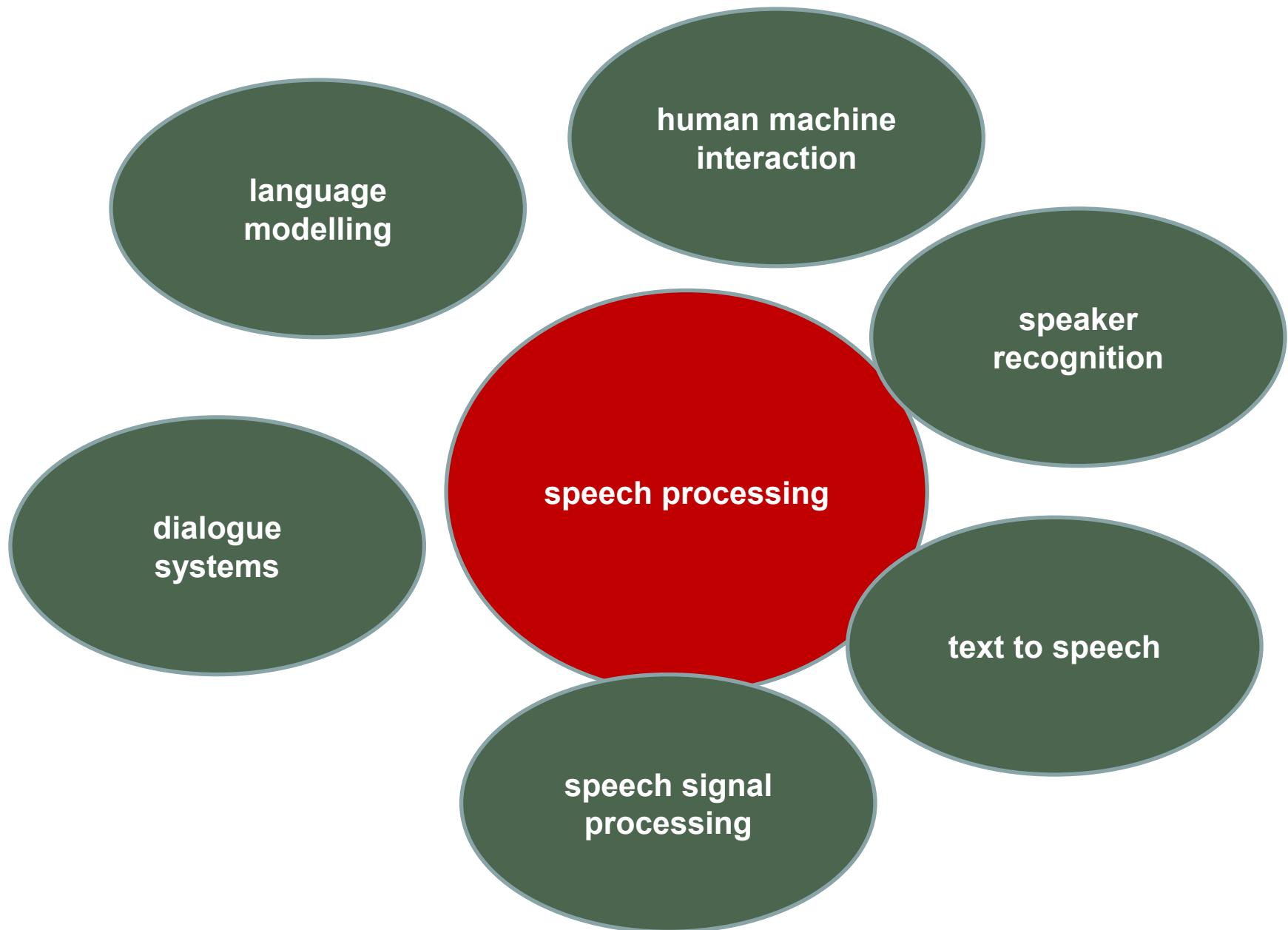
Deep networks, transformers, explainability (ASR)

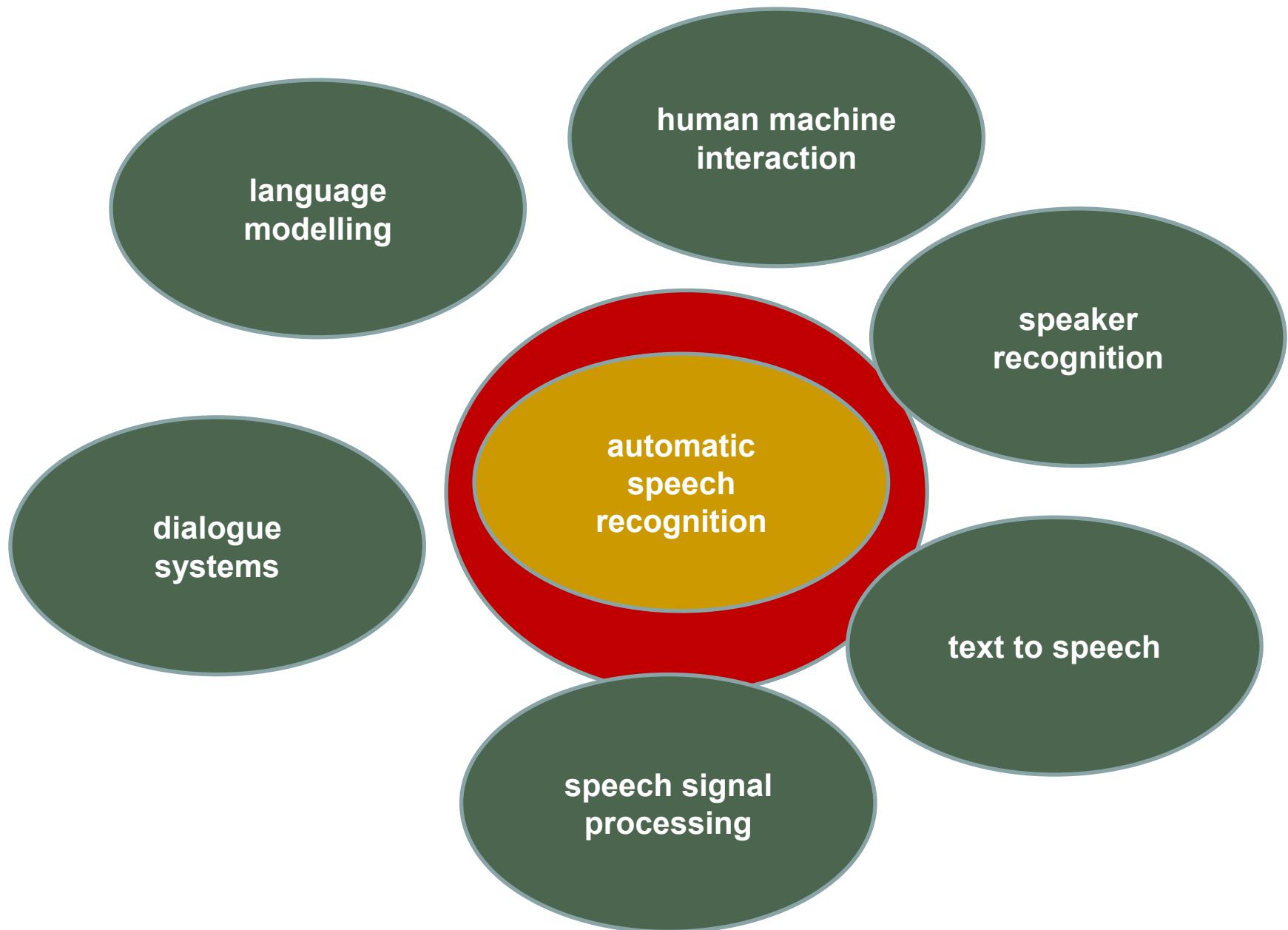


Louis ten Bosch
Radboud University
Nijmegen, NL

ASR & deep learning is a dynamic field.
Topics and techniques are changing rapidly.







Deep learning, AI

automatic
speech
recognition

dialogue
systems

language
modelling

human machine
interaction

speaker
recognition

text to speech

speech signal
processing

Audience?



For now:

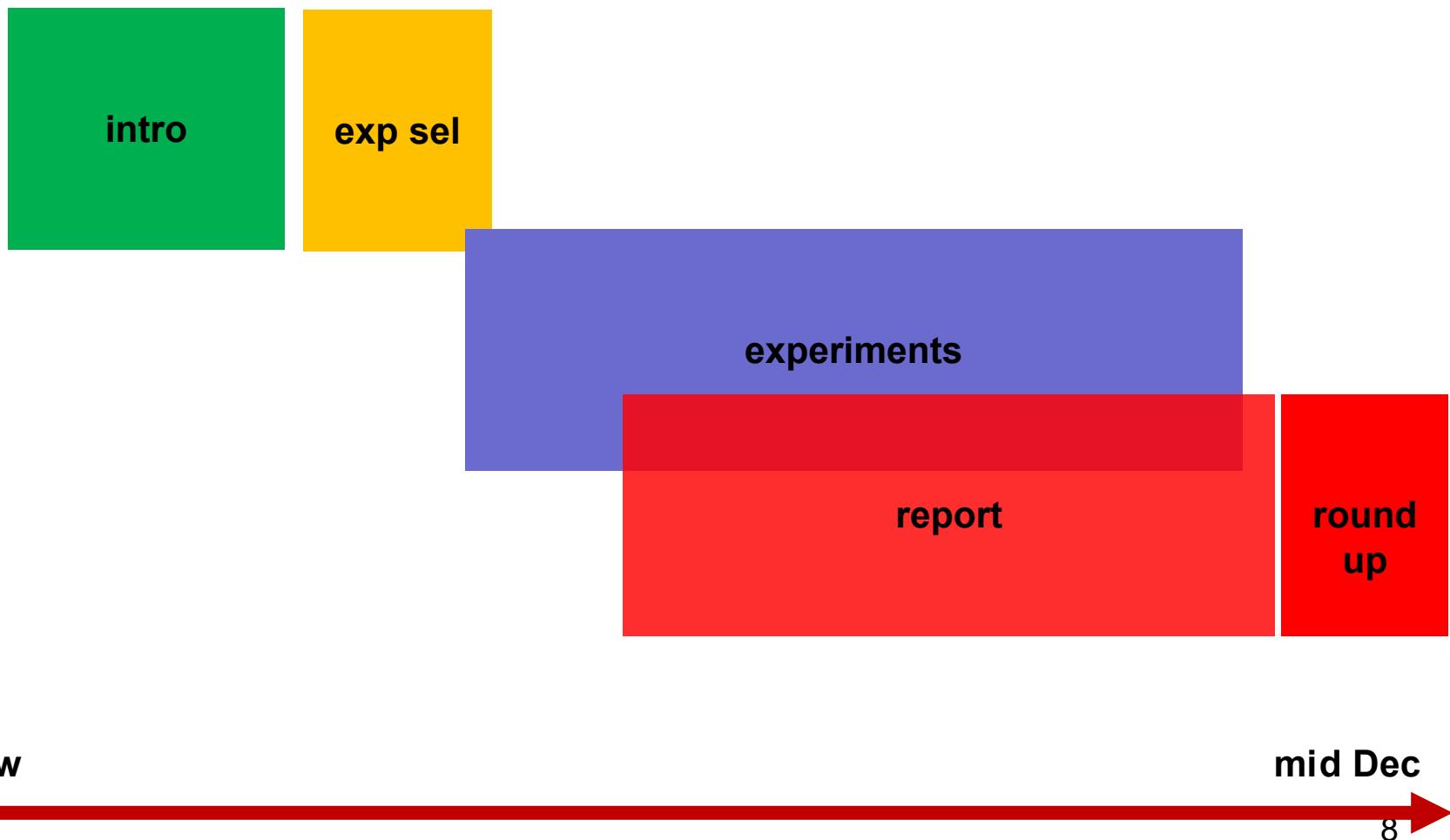


- AI
- Data Science
- Linguistics
- ...

Outline of the course

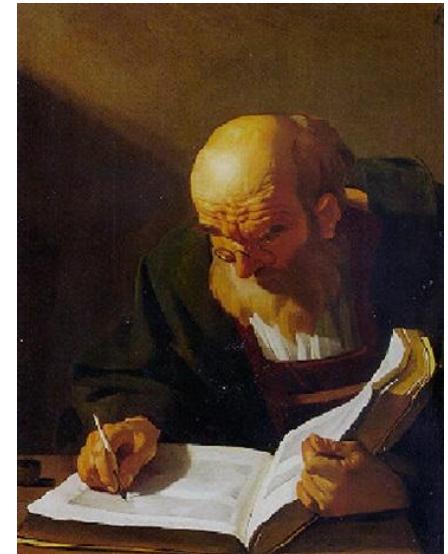
- Lectures
 - Discussion
- Experiments
 - Working individually or in small groups
 - You may choose your own topic/experiment (from a list)
 - You may use your own database, or one from the web
- Brief report
 - Assessment done by Dec 18 (ideally)
- All material: github: [Itenbosch2/Graz_github](https://github.com/Itenbosch2/Graz_github)

Time line of this course



Report

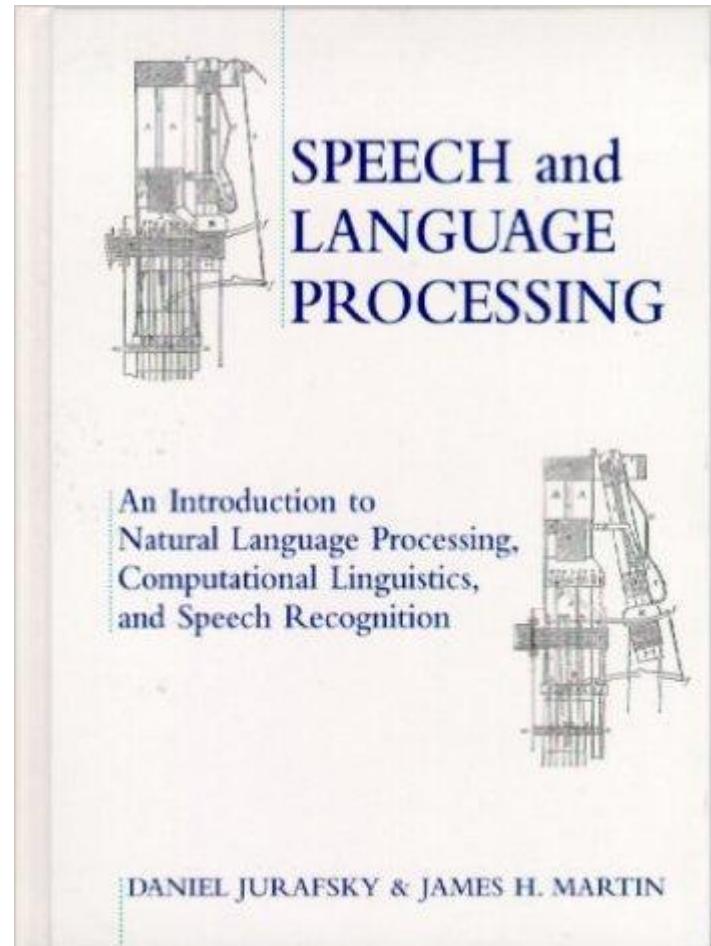
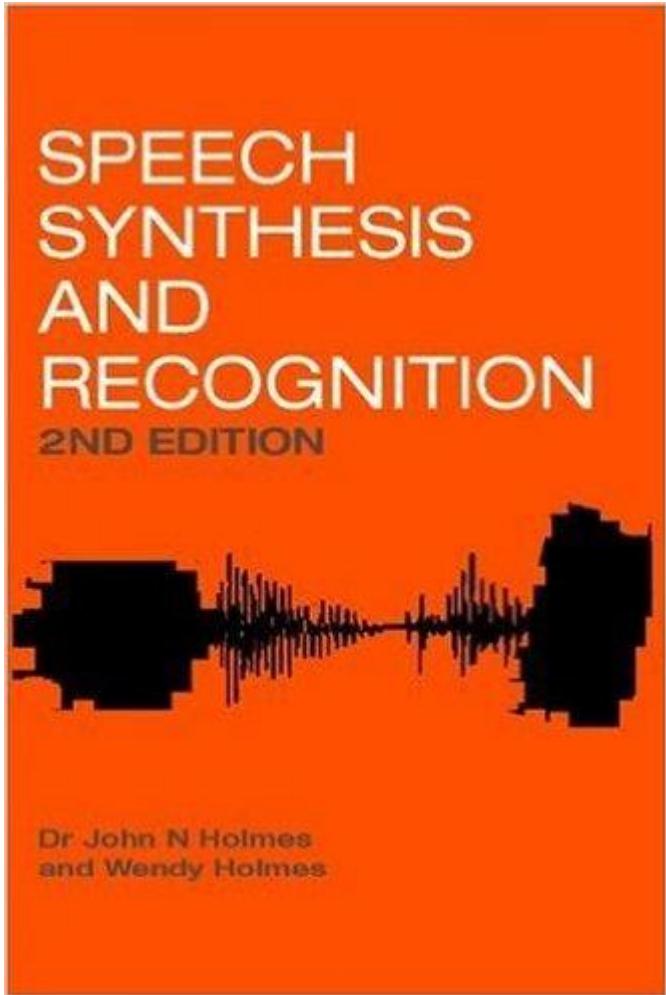
- Topic:
 - ASR/AI is way too broad to be dealt with in a few weeks
 - based on experimental work
 - but may also be theoretical
 - Topics: will be discussed later
- Experiment: **individual or in a group**
- Writing: always individual
- Assessment: individual



Reading material

- Classical books
 - Holmes & Holmes
 - Jurafsky and Martin: <https://web.stanford.edu/~jurafsky/slp3/>
- Papers
 - the “classics” (e.g., Vaswani et al., Baevski et al.)
 - Interspeech
 - https://www.isca-archive.org/interspeech_2025/index.html
 - ICASSP
- A number of key papers are given in the course
 - Additional material may vary – usually depends on your experimental project

Books – the classical ones



Interspeech 2025 tutorial presentations

- 1. Tutorials - Automatic Quality Assessment for Speech and Beyond https://voicemos-challenge-2023.github.io/speech-synthesis-evaluation/IS2025_tutorial.pdf
- 2. Nvidia NeMo toolkit for speech applications https://drive.google.com/file/d/1hIfFnVNrdHQ_FrvgVJRw4XNszl-aXVUz/view?usp=drivesdk
- 3. Speech Technology meets early Language acquisition: How interdisciplinary efforts benefit both the fields <https://zenodo.org/records/17018214>

Overview of the course

Date	Topic
Nov 10, 14	Lecture: Intro, overview course Literature
Nov 17, 20	Literature, brainstorm topics for experiment
Fr Nov 21	Literature presentations, selection of experimental topic Set-up (small) experiments
Nov 24 (2x)	Start experiments, discussion ongoing experiments
Dec 1	In groups or individual: 10-minute presentation Presentations of prelim experimental results
Tue Dec 9	Presentations
Mon Dec 15	Assessments and closing

As simple as it can be

```
1 from transformers import pipeline  
2 classifier = pipeline("sentiment-analysis")  
3 classifier(["I've been waiting for a HuggingFace course my whole life.", "I hate this so much!"])
```

```
[{'label': 'POSITIVE', 'score': 0.9598047137260437},  
 {'label': 'NEGATIVE', 'score': 0.9994558095932007}]
```