

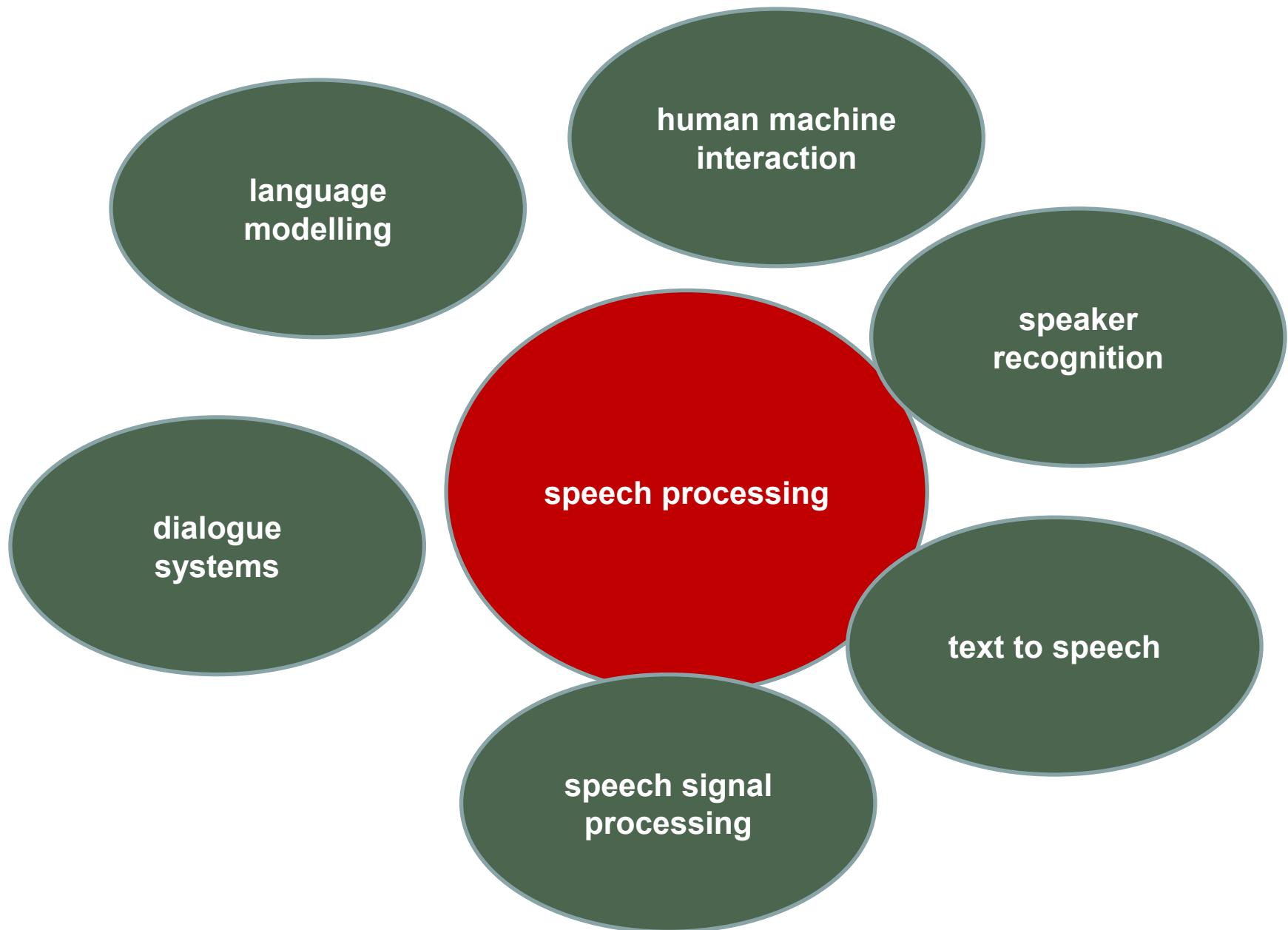
ASR, deep networks, transformers, explainability

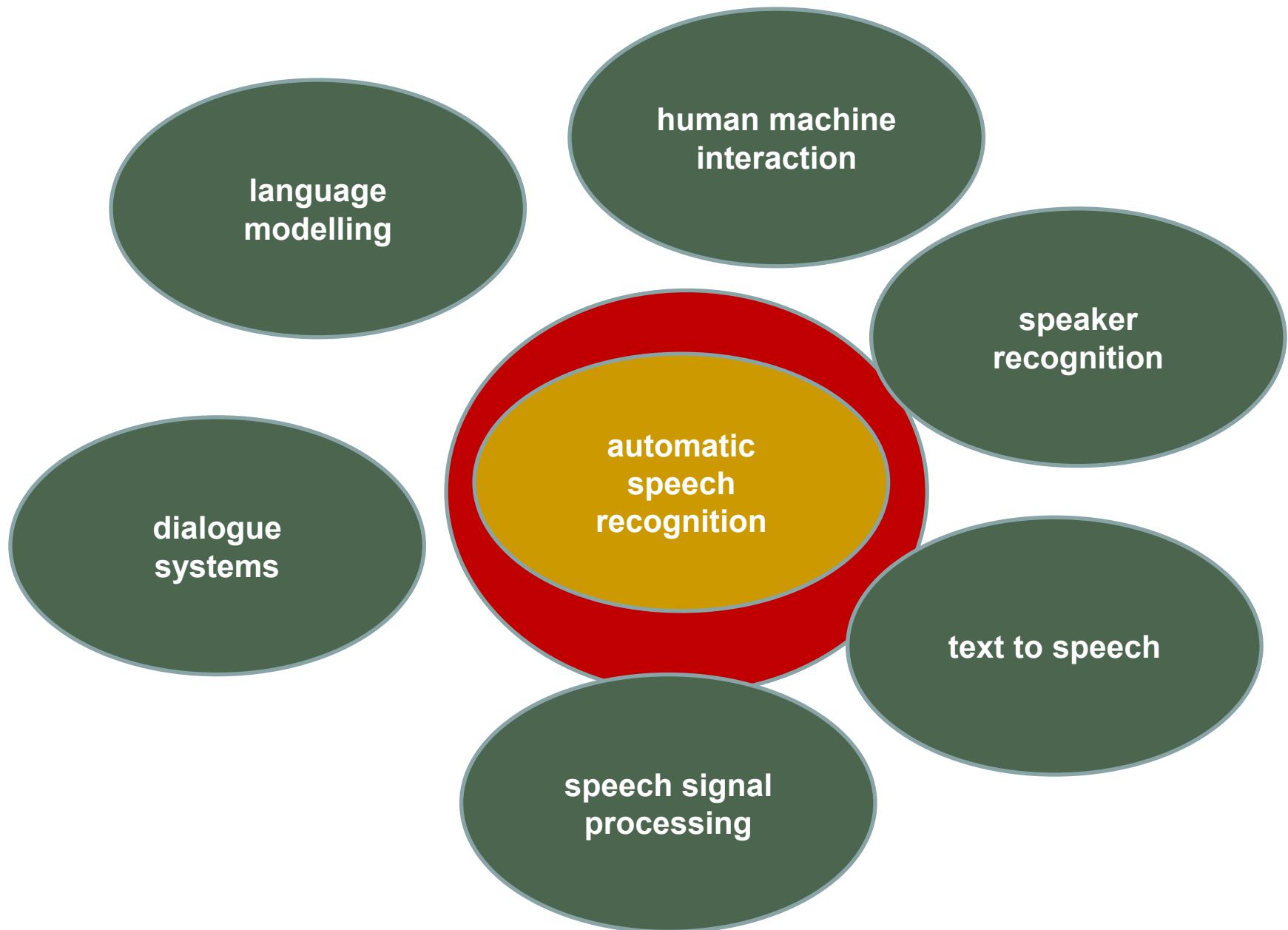


Louis ten Bosch
Radboud University
Nijmegen, NL
Graz, Nov-Dec 2025

ASR & deep learning & AI are dynamic fields.
Topics and techniques are changing rapidly.







Deep learning, AI

automatic
speech
recognition

dialogue
systems

human machine
interaction

speaker
recognition

text to speech

speech signal
processing

language
modelling

Audience?



For now:



- AI
- Data Science
- Linguistics
- ...

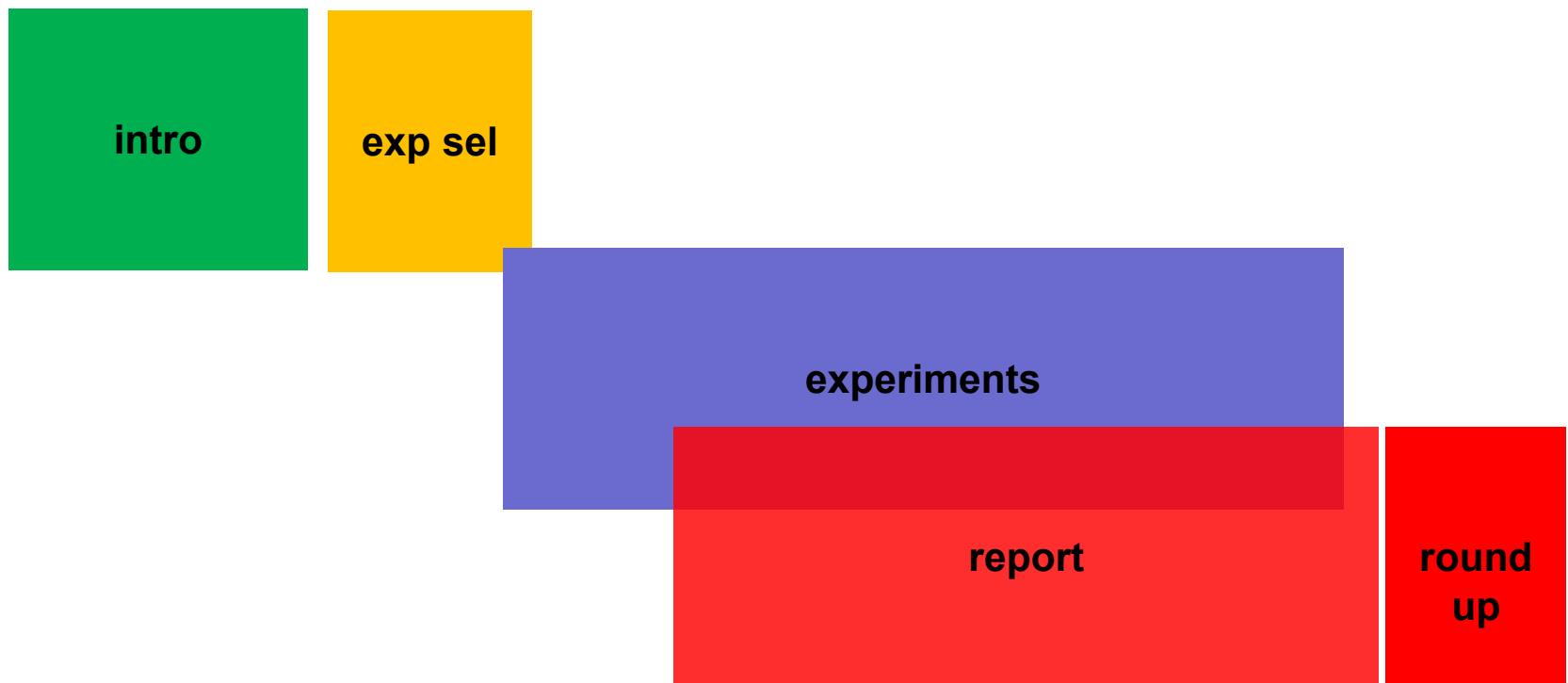
Outline of this course

- Lectures
 - Discussion
- Experiments
 - Working individually or in small groups
 - You may choose your own topic/experiment (starting from a list – see later)
 - You may use your own database, or one from the web
- Brief report
 - Assessment done by Dec 15/18 (ideally)
- All material on github: [Itenbosch2/Graz_github](https://github.com/Itenbosch2/Graz_github)

Overview of the course

Date	Topic
Nov 10, 14	Overview course, global intro, literature (Vaswani: NIPS*, Baevski: NeurIPS*) Relation with phonetics
Nov 17, 20	Verdini paper, architectures, a bit on reasoning. Brainstorm topics for experiment
Fr Nov 21	Final selection of experimental topic Set-up of (small) experiments
Nov 24 (2x)	Discussion ongoing experiments
Dec 1	In groups or individual: short presentations of prelim experimental results
Tue Dec 9	Finalization of experiments
Mon Dec 15	Assessments and closing

Time line of this course

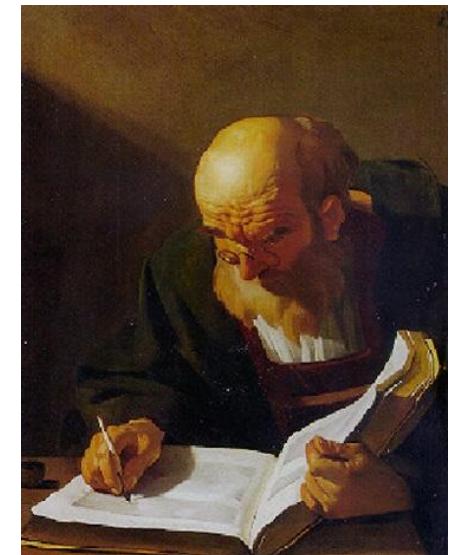


now

mid Dec

Report

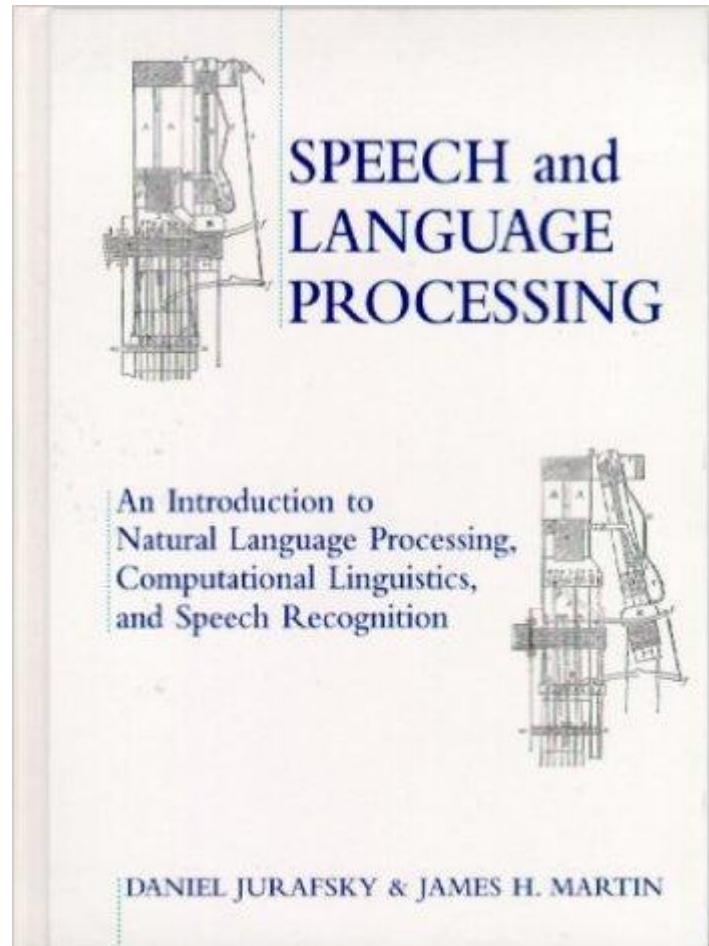
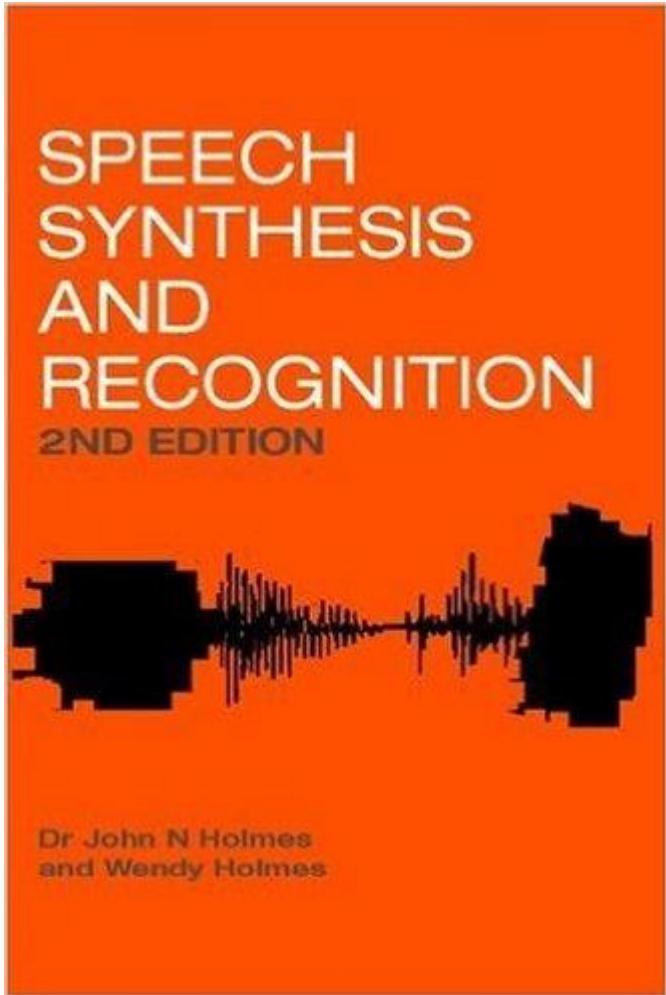
- Topic:
 - ASR/AI is way too broad to be dealt with in a few weeks, so start small
 - based on experimental work
 - (but may also be more theoretical)
 - Topics: will be discussed later
- Experiment: **individual or in a group**
- Writing: always individual
- Assessment: individual



Reading material

- Classical books
 - Holmes & Holmes
 - Jurafsky and Martin: <https://web.stanford.edu/~jurafsky/slp3/>
- Papers
 - Github
 - 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 – depends on your experimental project

Books – the classical ones



May be helpful: 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/1hlfFnVNrdHQ_FrvgVJRw4XNszl-aXVUz/view?usp=drivesdk
- 3. Speech Technology meets early Language acquisition: How interdisciplinary efforts benefit both the fields <https://zenodo.org/records/17018214>

As simple as it can be ...

Your three lines of python code!

```
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}]
```