# ATCO² project

https://www.atco2.org

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Idiap Research Institute, Ecole Polytechnique Fédérale de Lausanne, Brno University of Technology, Saarland University, OpenSky Network, ReplayWell, Honeywell, Romagna Tech, Evaluations and Language Resources Distribution Agency (ELDA)

Title of proposal: **Automatic collection and processing of voice data from air-traffic communications**

Proposal acronym: **ATCO$^2$**

Proposal duration: **24 months**

Topic identification: **Automated data collection and semi-supervised processing framework to deep learning (JTI-CS2-2018-CfP09-LPA-03-16)**

Topic leader: **Honeywell (Pavel Kolcarek), Airbus**

Types of action: **CS2-AI Innovation action (Project officer: Alexandra Gurau)**

Partners: **Idiap Research Institute, Brno University of Technology, Saarland university, Open Sky Network, ReplayWell, s. r. O., Evaluation and Language Resource Distribution Agency, Romagna Tech S.C.p.A.**

Clean Sky 2
JOINT UNDERTAKING

ATCO2

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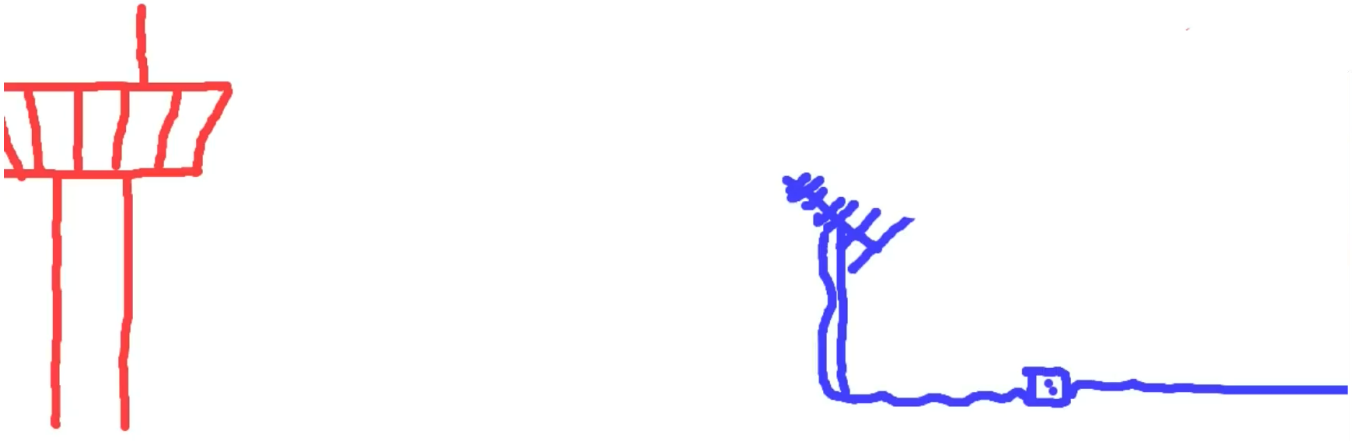
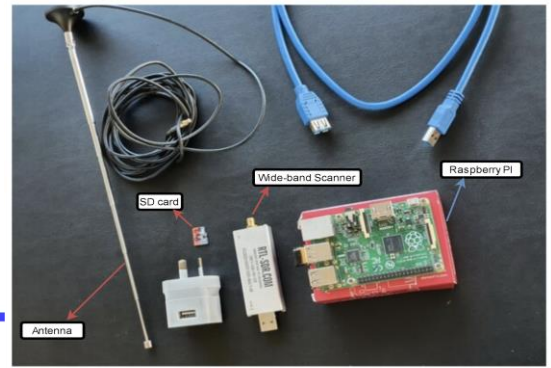
BRNO UNIVERSITY OF TECHNOLOGY
speechfit
ReplayWell
UNIVERSITÄT DES SAARLANDES
idiap
RESEARCH INSTITUTE
OPENSKY NETWORK
romagnatech
elda





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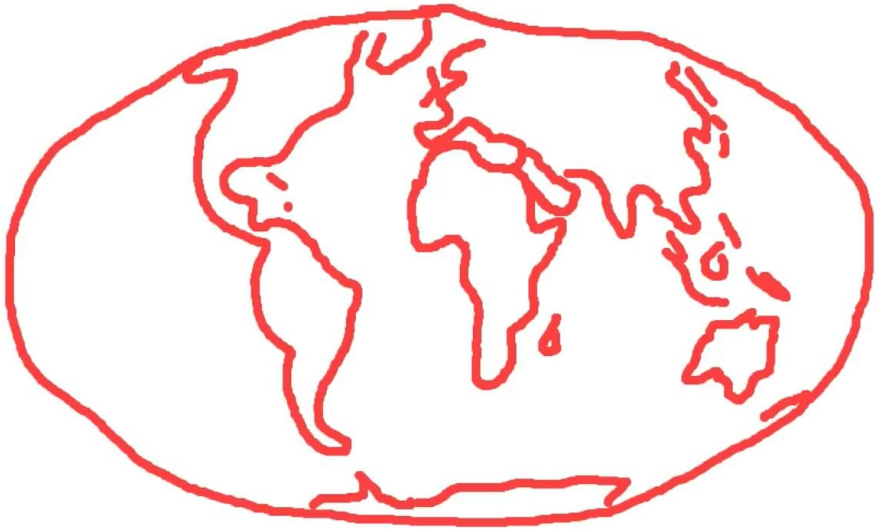

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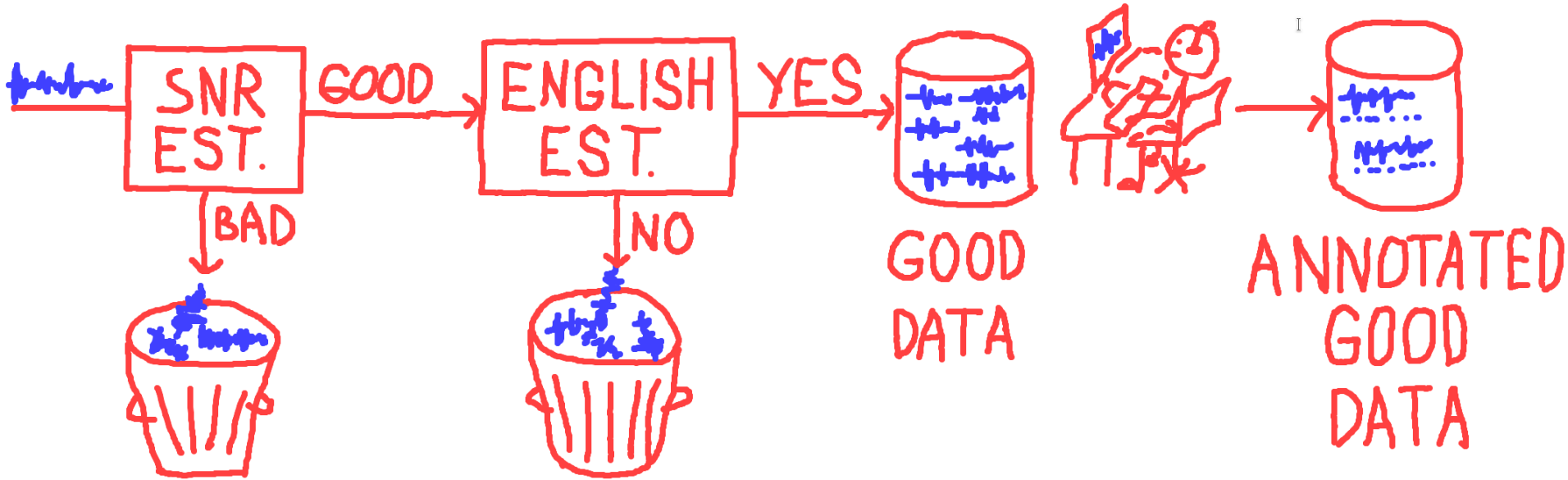
**Clean nice audio**

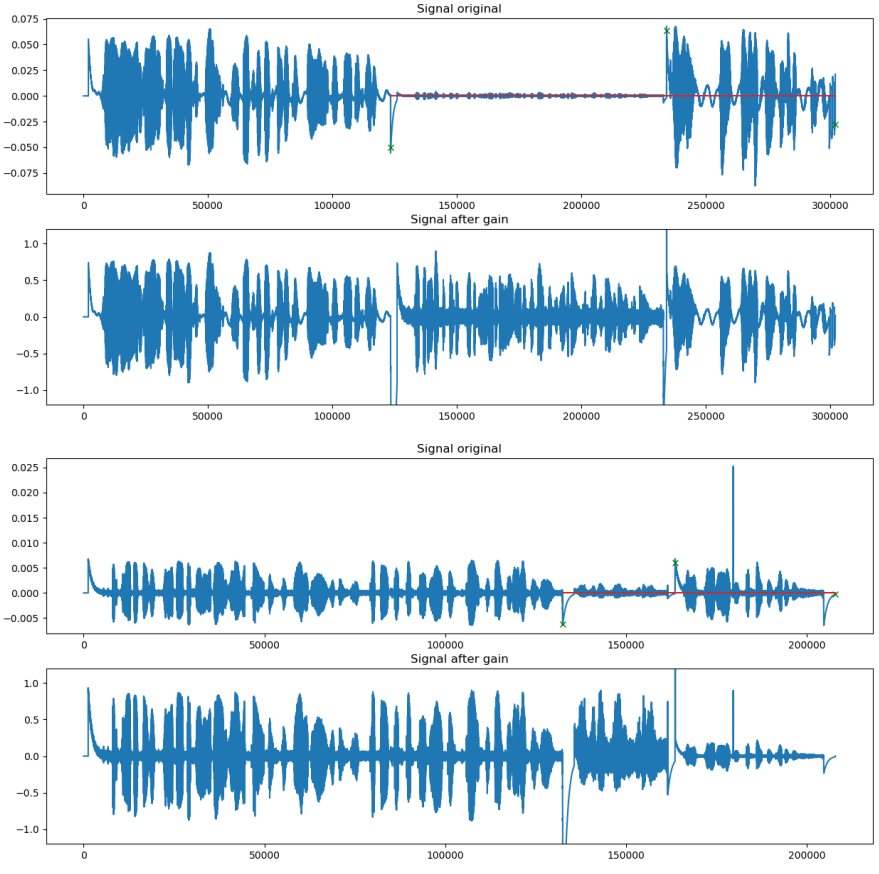
**Accented English**

**Non-English**

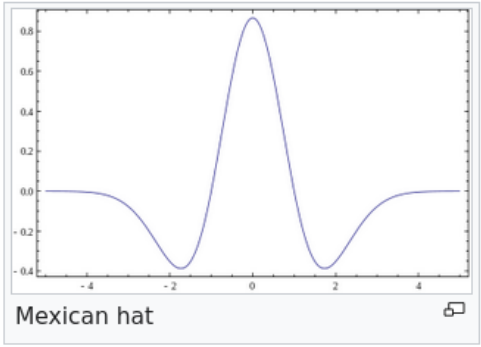
**Noises and distortions**

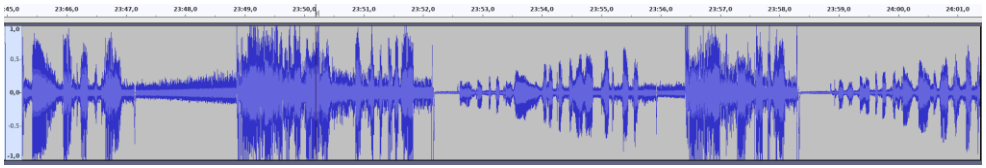

SNR EST.
GOOD
ENGLISH EST.
YES
BAD
NO
GOOD DATA
ANNOTATED GOOD DATA

# Raw data post-processing - segment based gain



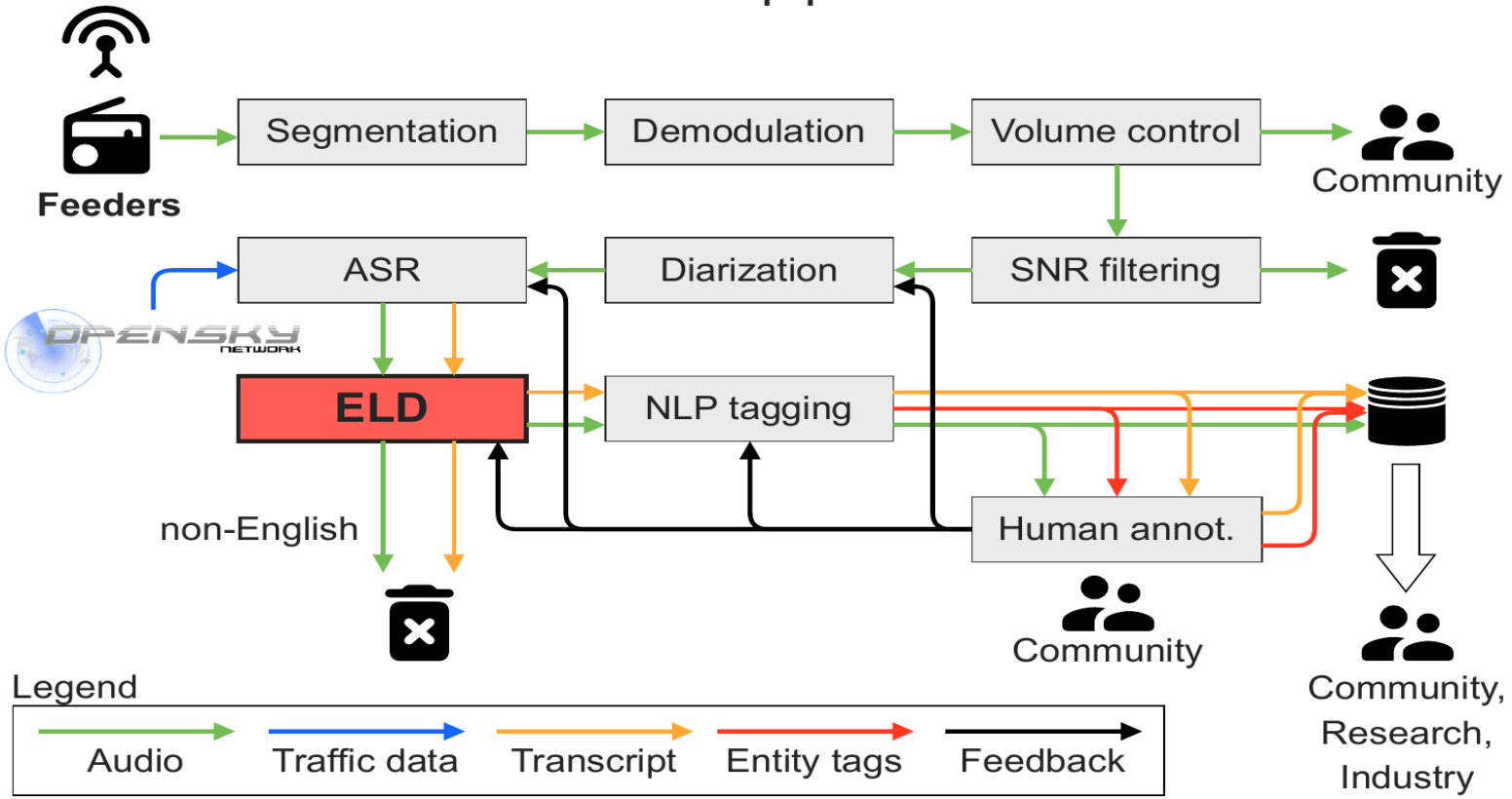

```
sig=signal.decimate(audio,8)
sig=np.abs(signal.decimate(sig,8))
peaks=signal.find_peaks_cwt(sig,[30])
```



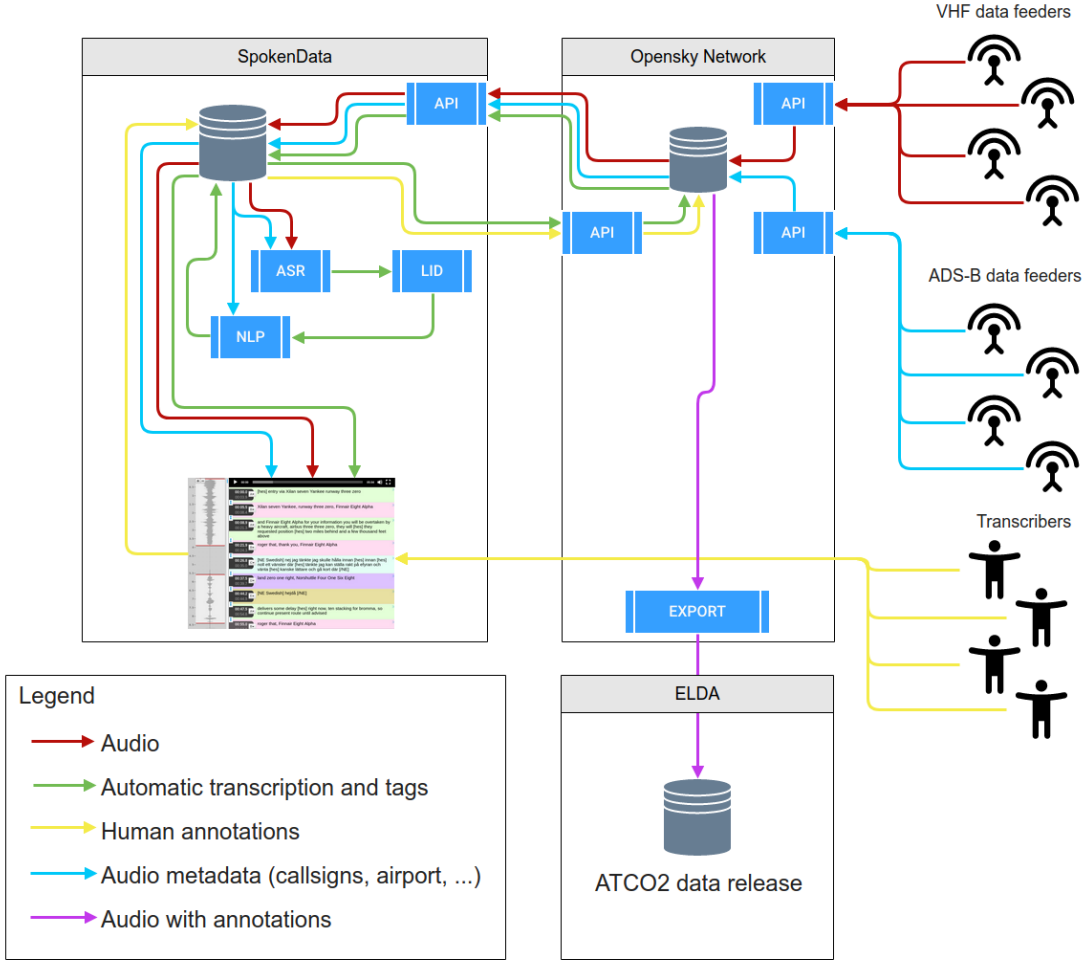



# Pipeline

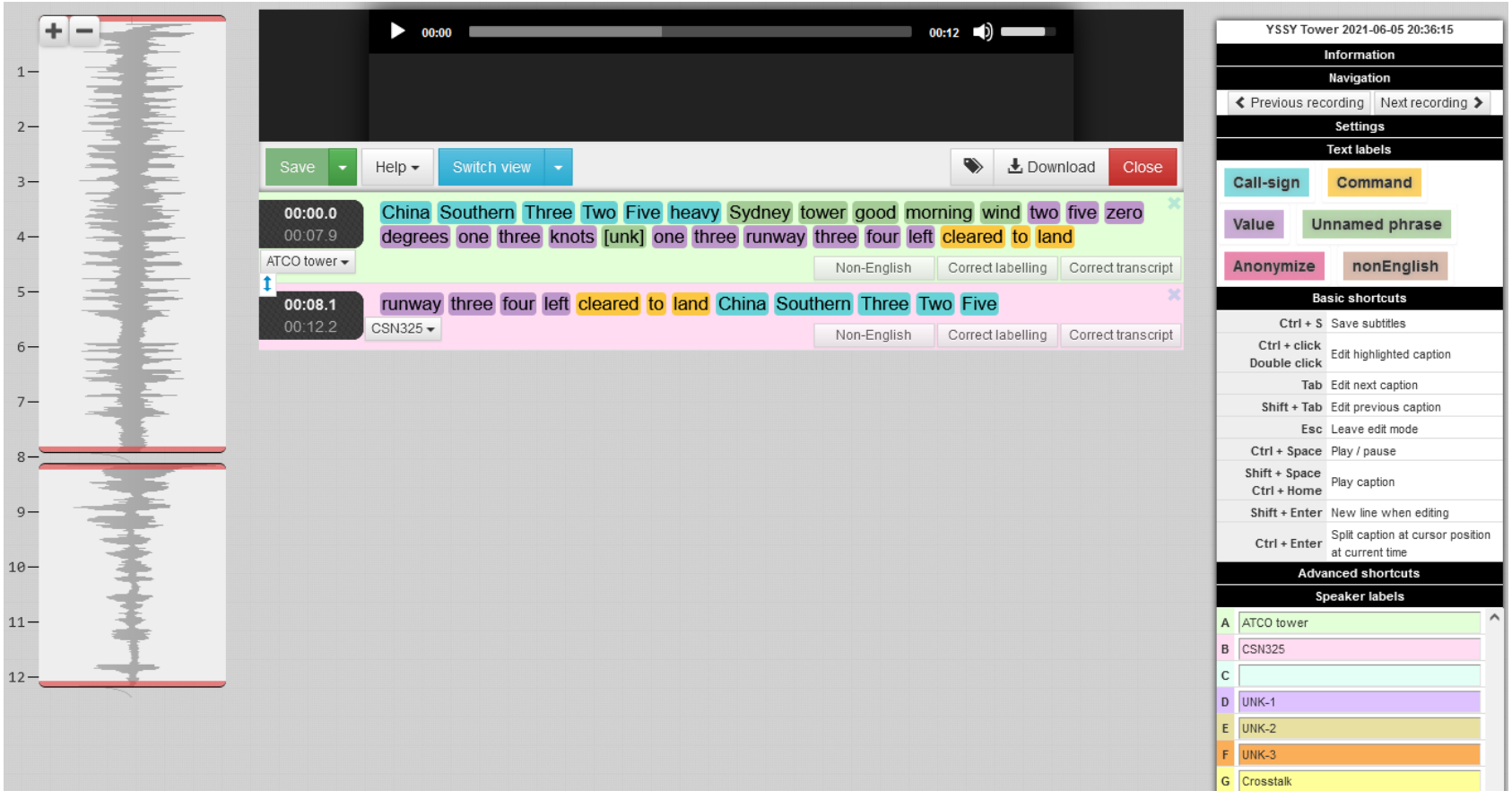
## ATCO$^2$ pipeline



# ATCO2 communication - Version C



# Annotation platform



# ATCO2 output

- **Data collected so far:**
- All: **1517 (hours)**
  - LZIB: 22
  - LKPR: 590
  - LSZH: 287
  - LKTB: 341
  - EETN: 4
  - LSGS: 68
  - LSZB: 138
  - YSSY: 65
- **~3 hours transcribed, ~1 hour tagged**

- **We have published**
  - LID data: English/Czech/French/German 15 hours of speech
  - ASR data: 60 minutes of transcribed English ATC speech

# ATCO2 legal and ethical issues

The ATCO2 Consortium is also investigating the **legal** and **ethical** aspects of ATC data collection, sharing and analysing.

Main ambits of interest:

- **privacy** and **data protection**,
- **data management** and **security**,
- **Intellectual Property/ownership** of ATC databases,
- **ATC as open/public data**, etc.

Critical aspects:

- difficulty in finding clear, specific rules and regulations,
- diverging nation-based rules.

# Questions?