NTNU
Innovation and Creativity

Sharing speech data
- notes from a small language

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Ingunn Amdal
Norwegian University of Science and Technology (NTNU)
Trondheim, Norway

Main issues in sharing data

The user of the data (researcher, developer, ...) must

- Be aware of that the data exists
- Have access to the data (legally and economically)
- Be able to use the data (formats)

CLARIN (and FLaReNet) the solution — hopefully

What's special with speech?

- Large amounts of data
  - Multimodal corpora - even more data
    Should always include video for face-to-face dialogues
- Expensive to collect and annotate
- (Most) available speech data collected for speech technology purposes
- Existing organization for sharing data:
  - LDC
  - ELRA/ELDA
  - National language banks
- Informants
- Spontaneity

Speech issues (1)

- Companies and universities: different types of data and different interests - may still benefit from sharing data

- Heterogeneous types of data: same infrastructure?
  - Large speech technology databases
    e.g. Broadcast News data 100+ hours with
    complicated annotation and several parties (legally complicated)
  - Large linguistic research databases
    e.g. Scandinavian Dialect Corpus
  - Smaller linguistic research databases
    e.g. word tone - still interesting to share
  - Companies collecting data for speech technology applications
    may want to share if the infrastructure is there

Speech issues (2)

- Informants and spontaneity:
  - right to privacy and intellectual property
  - manuscript read speech easier - agreement with the informant
  - want spontaneous speech - more difficult
  - in-between: interviews and moderated dialogues
- Who should bear the "burden" of organizing, settling of legal issues, and maintenance needed for sharing?
  - Guidelines to help organizing, including legal issues
- Requirements to share to get funding?
  1. Minimum template to be registered in CLARIN
  2. Medium template to get public funding
  3. Maximum template to provide a structure for those who want to share information

Norwegian language bank

- BLARK reports in 1999, 2002, and 2008
- Formally started in 2008
- Now a part of the national library
  (but no separate budget or board …)
- NST-data secured and made available
- No money to collect more data, yet

Numbers from 2002 on Norwegian BLARK:

- Total of 100 mill NOK
- About 50 mill for speech data

Need for Norwegian speech data

Norwegian language bank report 2002 identifying needs:

- Telephone speech
  - Manuscript read (also for mobile phones): 400 hours
  - Spontaneous: 200 hours
- Studio quality
  - Manuscript read: 5-600 hours
  - Spontaneous: 500 hours
- Audio
  - Spontaneous: 100 hours
- Multimodal data: for later
- Multilingual data: for later

Existing Norwegian speech data

- Some data already available through ELRA:
  - SpeechDat (II), 65 hours manuscript read telephone speech over fixed telephone network, 1016 speakers
- NST data available through Norsk Språkbank:
  - Dictation data: app 500+50 hours (1000+100 speakers)
  - Telephone speech: 1000 hours (8000 speakers) of Norwegian
  - Speech synthesis database: 15 hours (1 male speaker)
- Data at the universities:
  - Varying availability
- Data at companies:
  - Varying availability

Small language issues

- Reports on “problems” on how to select from too much data at Interspeech this year
- We are NOT anyway near such problems
- Still lack of data – therefore motivated to share
- ”Same” interest as Humanities and Social sciences

- CLARIN must deal with less interest from larger languages:
  ”what’s in it for me”

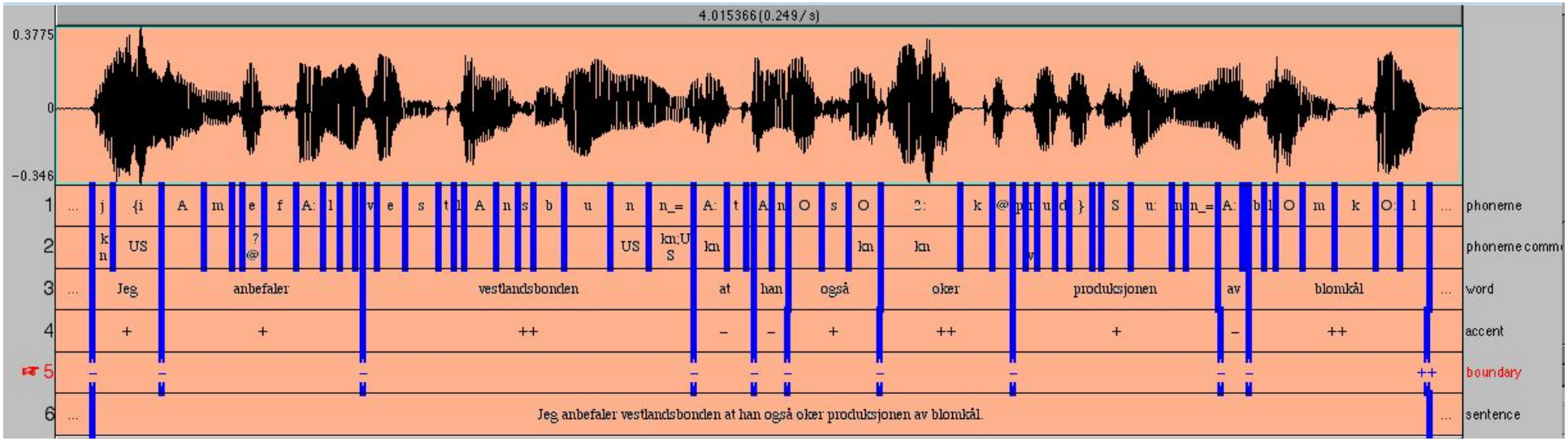
Suggestions

- Fortunately: Speech technology databases in ELRA will be available in CLARIN through ELRA (I hope)
- Suggestion: Target smaller databases at universities first. When CLARIN has become ”THE” repository others like companies will join
- Focus on future data collections
  Willingness in at least Norwegian national funding to have sharing demands for funding

First FONEMA database: FonDat1

- Development of automatic annotation tools (for TTS data) in the Fonema project requires evaluation experiments
- The database **FonDat1** was collected to serve as a test bed for the annotation tool development.
- In addition, the is used to conduct experiments with unit selection synthesis
- Contents:
  - 2 professional speakers (actors): one male, one female
  - To channel recording: Speech and EGG
  - 2000 sentences read newspaper texts (app 3 hours)
  - Manuscript: Greedy search using diphone coverage criteria
  - 10% manually annotated (phonemically and prosodically)

Manual phonemic and prosodic labeling of FonDat1



- Later TTS-databases:
  - Xenophones included
  - Automatic annotation: realistic manus=high OOV rate
  - POS-tags in text for pronunciation disambiguation (\PRT="v"\berget)
  - Speaker specific pronunciation lexicon

Rundkast

http://www.iet.ntnu.no/projects/rundkast/

Database of 70-80 hours radio broadcast news from the Norwegian Broadcasting Corporation (NRK):

- Read and spontaneous speech, as well as spontaneous dialogs and multipart discussions
- There is large variation between speakers, speaking styles and topics
- Speaker turns may be rapid and several speakers may talk simultaneously
- The quality of the recordings include studio and telephone (mobile, satellite etc)
- Frequent occurrences of background noise, jingles, music and audio illustrations

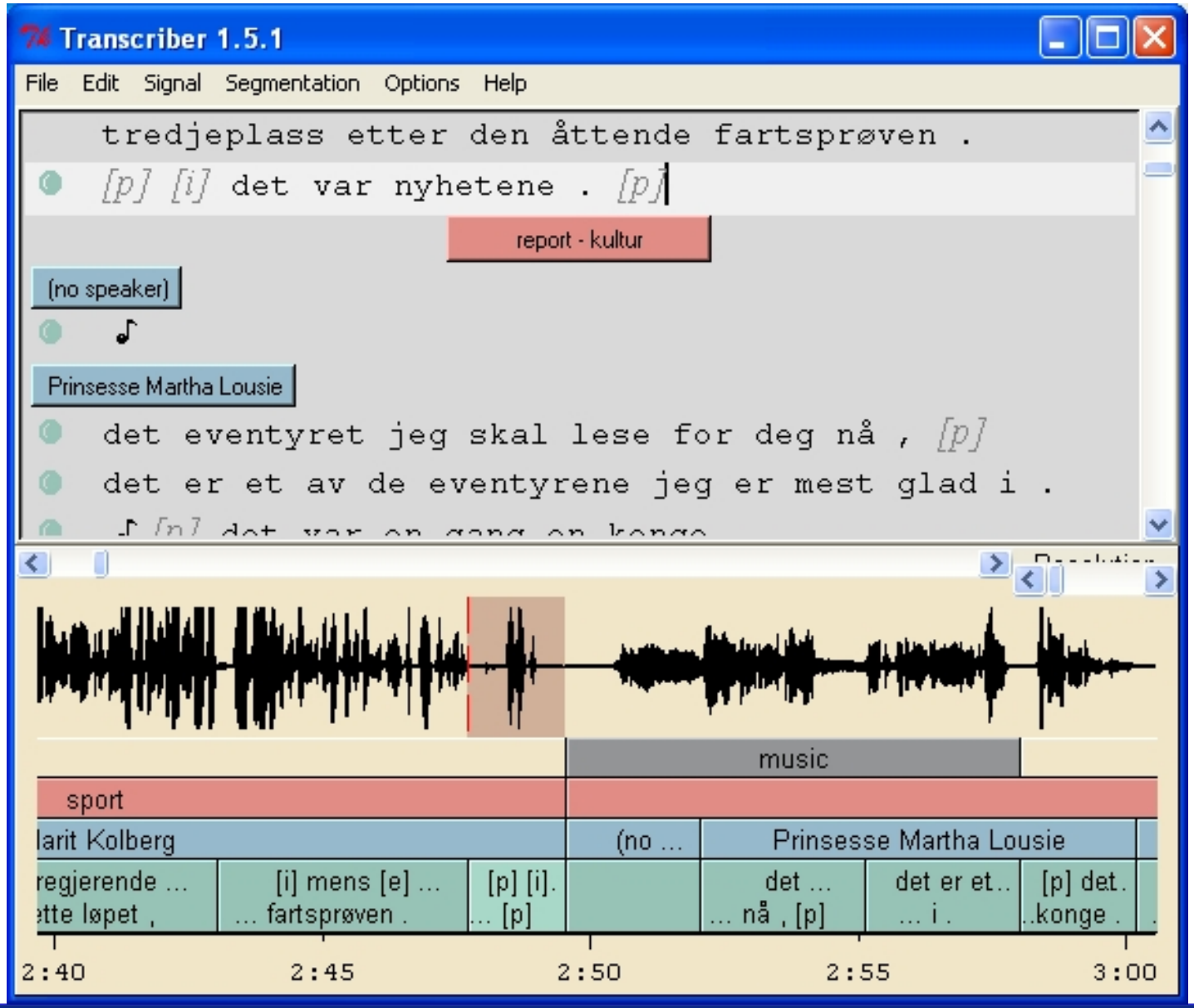
Funded by NTNU

Example speech metadata

Broadcast news database Rundkast

- Hierarchically organized and orthographically annotated:
  - Name of programme, type and date
  - Name of speaker (if known) and dialect (5 regions)
  - Type of speech: spontaneity, channel, recording quality
  - Segmented in speaker turns of app. 2-5 seconds
  - Orthographic transcription (standard Norwegian)
  - Labels for noise (speaker noise, background noise etc.)
  - Labels for pronunciation mistakes, foreign words, unintelligible speech etc.
- Transcriber:
  ”standard” tool and therefore annotation standard ...

Example speech annotation in Transcriber



Rundkast data for phonemic annotation

- 10 speakers (5 male and 5 female)
- Amount of speech per speaker:
  - app 5 min ”planned” speech and 1 min spontaneous speech
  - discard noisy parts (as far as possible)
  - from more than one programme
  - use turn segmentation from orthographic annotation
- All in all 1 hour of speech
- Approximately 1000 hours of work

Phonemic annotation

- Use existing standards
  – with necessary adjustments
- TIMIT: US English
  Again de facto standard, this time for phonetically based ASR experiments
- Norwegian speech synthesis: Specifications and experiences from several databases

- ”Suitable” level of detail: Acoustic boundaries should be labeled, but more phonemic than phonetic
- Consistence of utmost importance!

Main principles for phonemic annotation in Rundkast

- The annotation will be mainly phonemic using the phoneme symbols closest to the perceived sound
- Acoustic boundaries should be marked, include some acoustically motivated symbols
- A transcription as close as possible to the citation form is preferred
- Norwegian standard SAMPA is preferred
  - Some English phonemes included as well as dialect variants
  - Example: 3 variants of the /r/-sound
    /r/ (tap/trill)
    /R/ (uvular fricative)
    /r\/ (approximant)

Comments on deviations

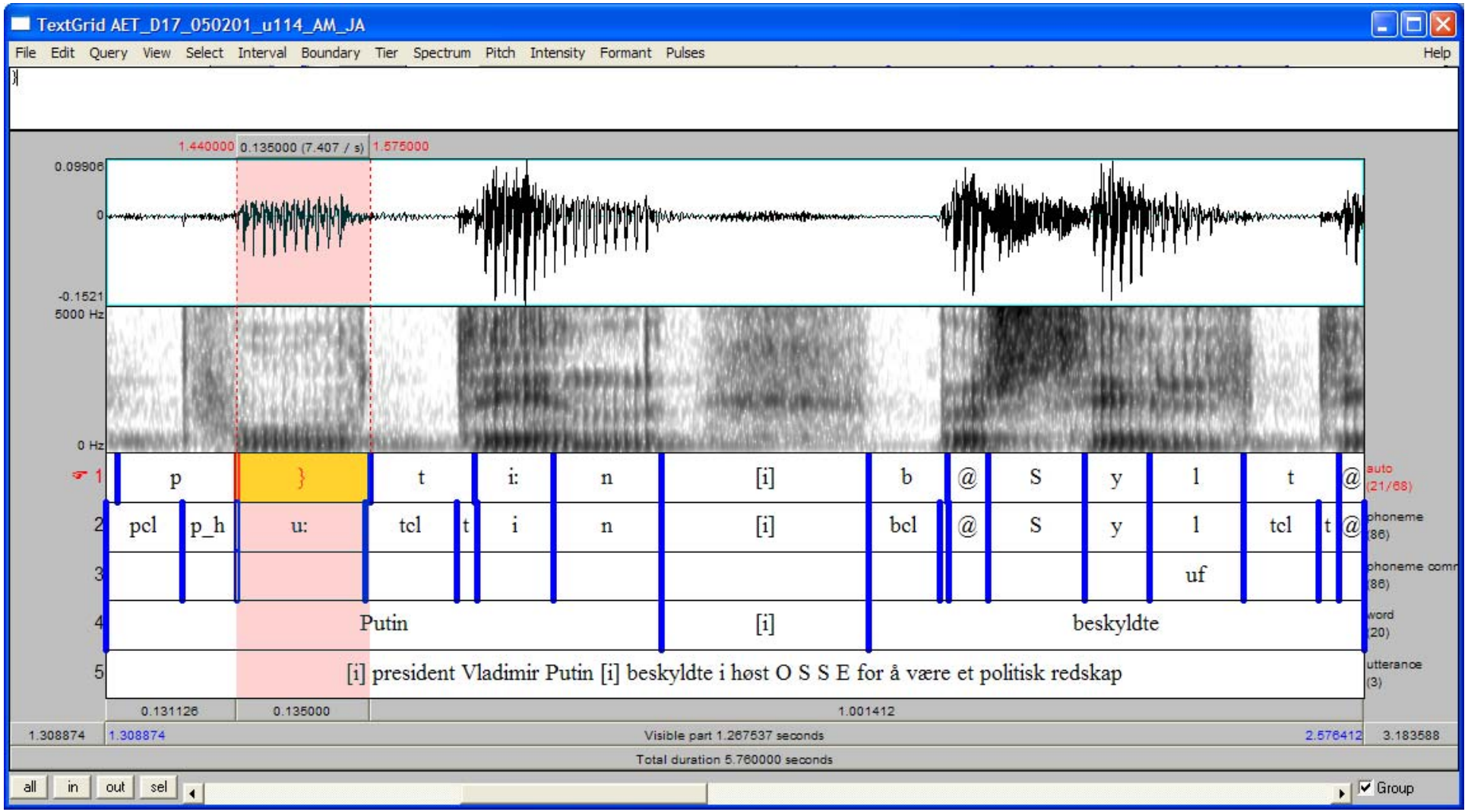
Always cases of uncertainty, need a log for these.

Problem: will the log be read?

Solution: Codes for deviations!

- Synchronous with the phoneme tier (use Praat)
- Easy to utilize automatically
- Examples:
  - creaky voice
  - unexpected voiced/unvoiced
  - uncertain boundary or symbol
- ... in addition a log file with whatever deviations left

Example annotation in Praat



University of Oslo

Tekstlaboratoriet

http://www.hf.uio.no/tekstlab/

- Mostly text (as given by the name)
- Data already registered in CLARIN

BigBrother-corpus: 150k words (500k planned)

Scandinavian Dialect Corpus

- Norwegian part: 400 speakers from 100 loacations (2012)
- UiO, UiT (Tromsø) and NTNU

NoTa-Oslo

- 166 speakers, 900k words
- Multimodal: video, audio and transcription
- Planned to be expanded (Bergen, Trondheim)

L1-L2 word tone database

- Non-natives repeating Norwegian minimal pair words with different word tones
- 22 speakers from 2 L1s (+ 2 teacher voices)
- Partly segmented
- Assessment from several judges included (May also apply for TTS voices)

- Too small for ELRA? and for CLARIN?
- Too much overhead to make available?

NorKompLeks

- Not speech
- Wait with sharing till it is completed?
  That will be never!
- Keep track of what is changed, how?
  Version control!

- What about changes/additions from
  a third party made available?
- Important for scientific work to know
  which version one refers to

“Almost” existing databases

Norwegian TIMIT

- Needed, but not existing (and not in the BLARK)
- First proposal rejected
- Annotation planned in Rundkast style

Customer care human-machine dialog data

- Large amounts
- Willingness to share was there
  but not to do the legal work

Conclusions

- Data important both for humanities and speech technology research
  – sharing is the solution!
- Standards important
  – must be well designed to be used!
- Difficult to decide level of detail

- Start the CLARIN work with the ones interested and hope the speech community will gain interest when they see first results