

Emo-spectre

A tool for multi-modal feature exploration in time-series data

netherlands
eScience center

About me

Background in Computer Science
and Data Visualization



Research Software Engineer

Dr. Peter Kok

p.kok@esciencecenter.nl



INFO FEATURES

Inner brow raiser(presence) ✓ Inner brow raiser(intensity)

Outer brow raiser(presence) Outer brow raiser(intensity)

Brow lowerer(presence) ✓ Brow lowerer(intensity)

Upper lid raiser(presence) Upper lid raiser(intensity)

Cheek raiser(presence) Cheek raiser(intensity) Lid Tightener(presence)

Lid Tightener(intensity) ✓ Nose Wrinkler(presence)

✓ Nose Wrinkler(intensity) Upper Lip Raiser(presence)

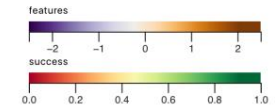


- Video
- Audio
- Text
- Topics

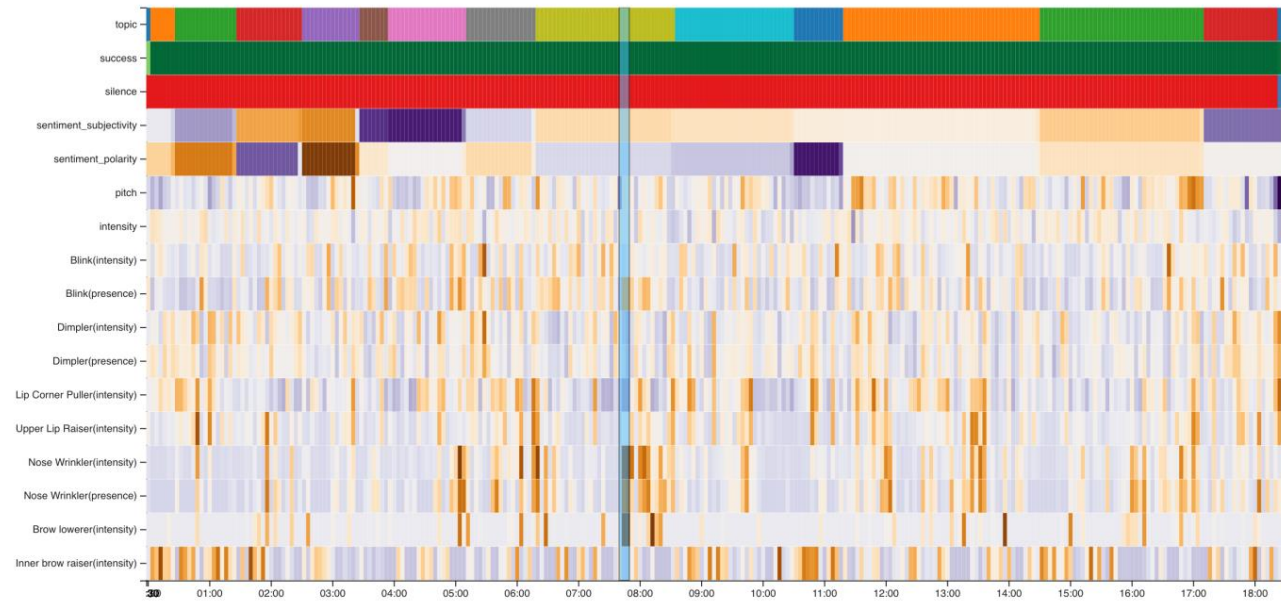
Normalize

Topics discussed in the video

- Geen beschrijving
- Hard time
- Stories of the American people about pain, beau
- What it means to be a president
- Previous voting and election
- Accomplishments of her husband when leaving
- Current situation of America
- Practicing empathy
- How the next generation sees America and how
- Our strategy for the upcoming election to defeat
- Message for the voters to make a change in this
- Life story of Joe Biden
- Motivating the people to vote despite of unfair t.
- Electing Joe Biden as the next president.

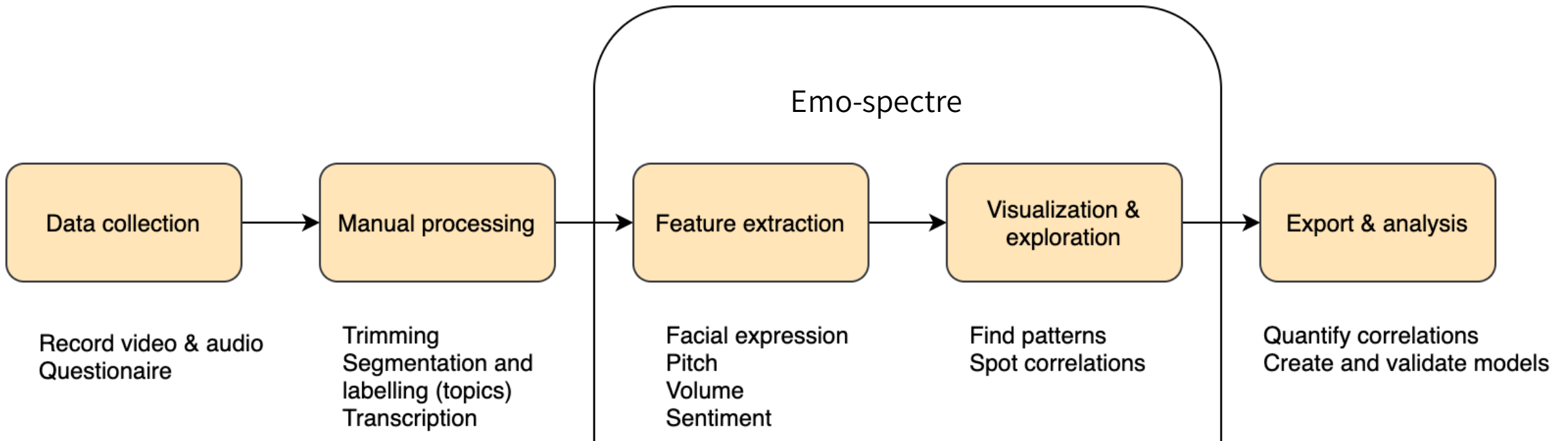


silence
 false
 true



EXPORT TO CSV

Researcher's workflow



EMO Spectre

Add videos
OPEN SINGLE VIDEO OPEN FOLDER CLOSE ALL

Videos (5)

- P102_S1_DUMMY_HM1.mp4 [ANALYZE VIDEO]
- P101_S1_DUMMY_HM1.mp4 [ANALYZE VIDEO]
- P107_S2_DUMMY_SM3.mp4 [UPLOAD VIDEO FILES]
- P103_S1_DUMMY_HM1.mp4 [ANALYZE VIDEO]
- P106_S1_DUMMY_HM1.mp4

EMO Spectre

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- Brow lowerer (presence) ✓ Brow lowerer (intensity)
- Upper lid raiser (presence) ✓ Upper lid raiser (intensity)
- Cheek raiser (presence) ✓ Cheek raiser (intensity) ✓ Lid Tightener (presence)
- Lid Tightener (intensity) ✓ Lid Tightener (intensity)
- Noise Winker (presence) ✓ Noise Winker (intensity)
- Upper Lip Follower (presence)

Normalize

Heatmap visualization showing feature intensity over time (00:00 to 00:20).

EXPORT TO CSV

eScience Center © 2021 App version 1.1.0



Video selection, upload & processing

EMO Spectre

Add videos

OPEN SINGLE VIDEO OPEN FOLDER CLOSE ALL

Videos (5)

P102_S1_DUMMY_HM1.mp4

P107_S2_DUMMY_SM3.mp4

P106_S1_DUMMY_HM1.mp4

P106_S1_DUMMY_HM1.mp4

Video files to attach

Pitch frequency
Low pitch

Audio file
P106_S1_DUMMY_HM1.wav


Transcription file
DUMMY_talk...t.TextGrid

Silences file
DUMMY_SIL.TextGrid


Topics
DUMMY_topics.txt

*complement files for the video

CANCEL ANALYZE




P101_S1_DUMMY_HM1.mp4
Sha256: 8716130d53bbdf0bd5ae4d675f8d3252627d96c976d3b30b62a9437cf3356336




Running

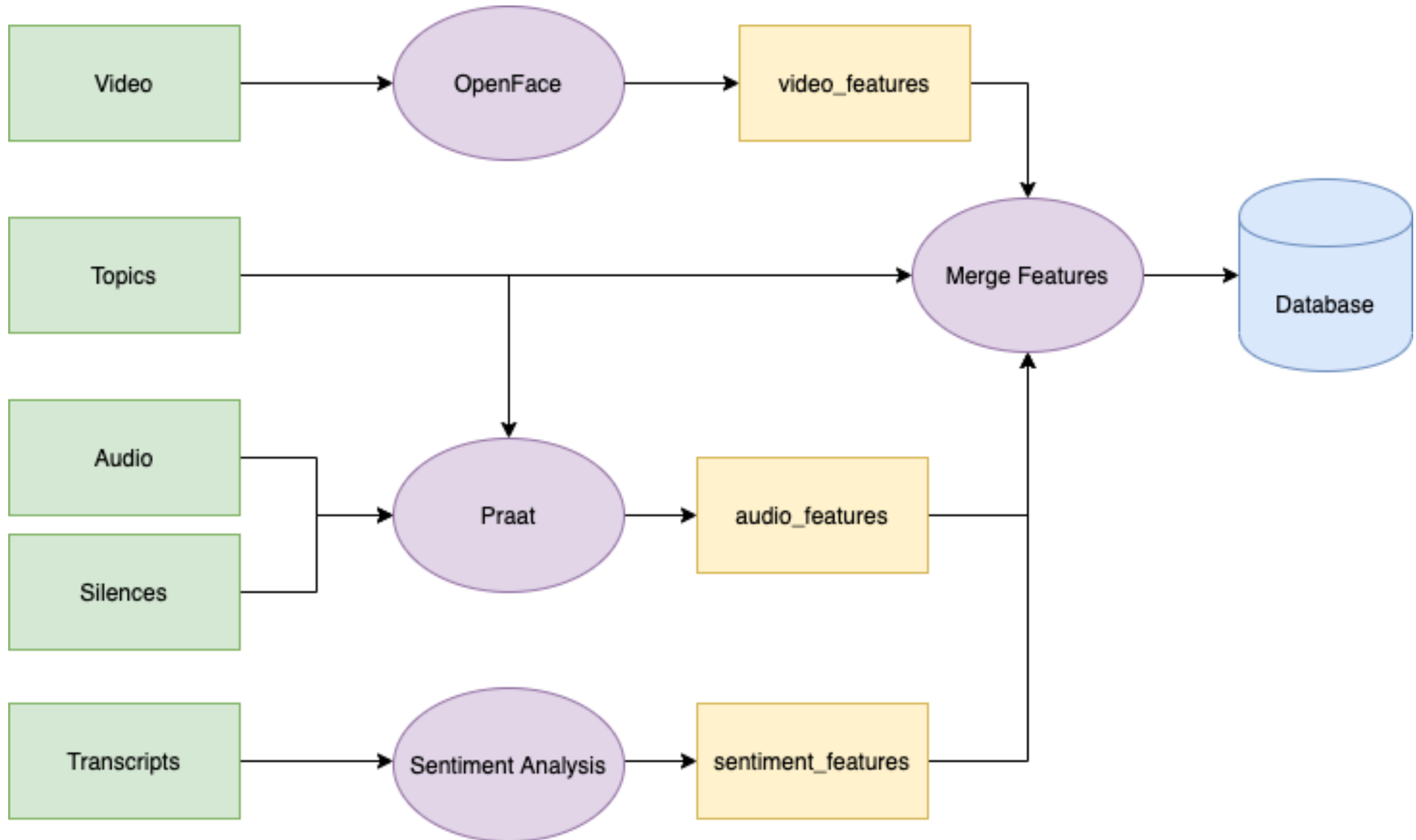
[The video is processing. It may take several minutes to complete. You can come later to this list.](#)



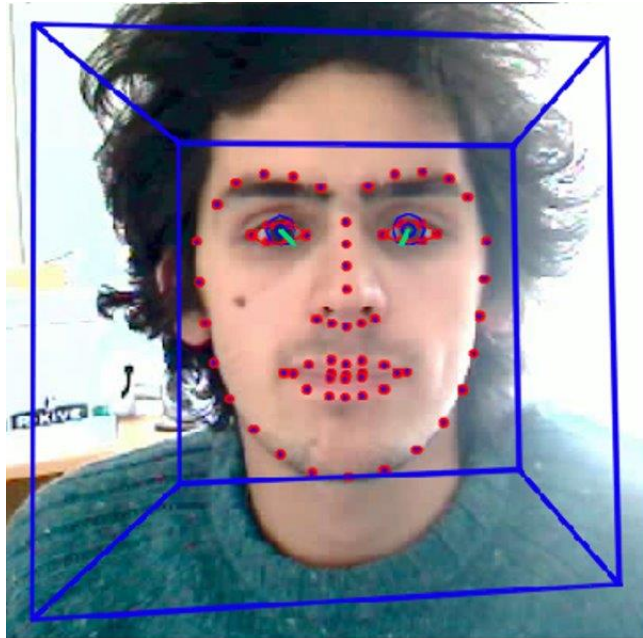
P102_S1_DUMMY_HM2.mp4



Feature extraction pipeline



OpenFace



FACS - Facial Action Coding System

AU	Description	Facial muscle	Example image
<u>1</u>	Inner Brow Raiser	<i>Frontalis, pars medialis</i>	
<u>2</u>	Outer Brow Raiser	<i>Frontalis, pars lateralis</i>	
<u>4</u>	Brow Lowerer	<i>Corrugator supercilii, Depressor supercilii</i>	
<u>5</u>	Upper Lid Raiser	<i>Levator palpebrae superioris</i>	
<u>6</u>	Cheek Raiser	<i>Orbicularis oculi, pars orbitalis</i>	
<u>7</u>	Lid Tightener	<i>Orbicularis oculi, pars palpebralis</i>	
<u>9</u>	Nose Wrinkler	<i>Levator labii superioris alaquae nasi</i>	
<u>10</u>	Upper Lip Raiser	<i>Levator labii superioris</i>	
11	Nasolabial Deepener	<i>Zygomaticus minor</i>	
<u>12</u>	Lip Corner Puller	<i>Zygomaticus major</i>	
13	Cheek Puffer	<i>Levator anguli oris (a.k.a. Caninus)</i>	

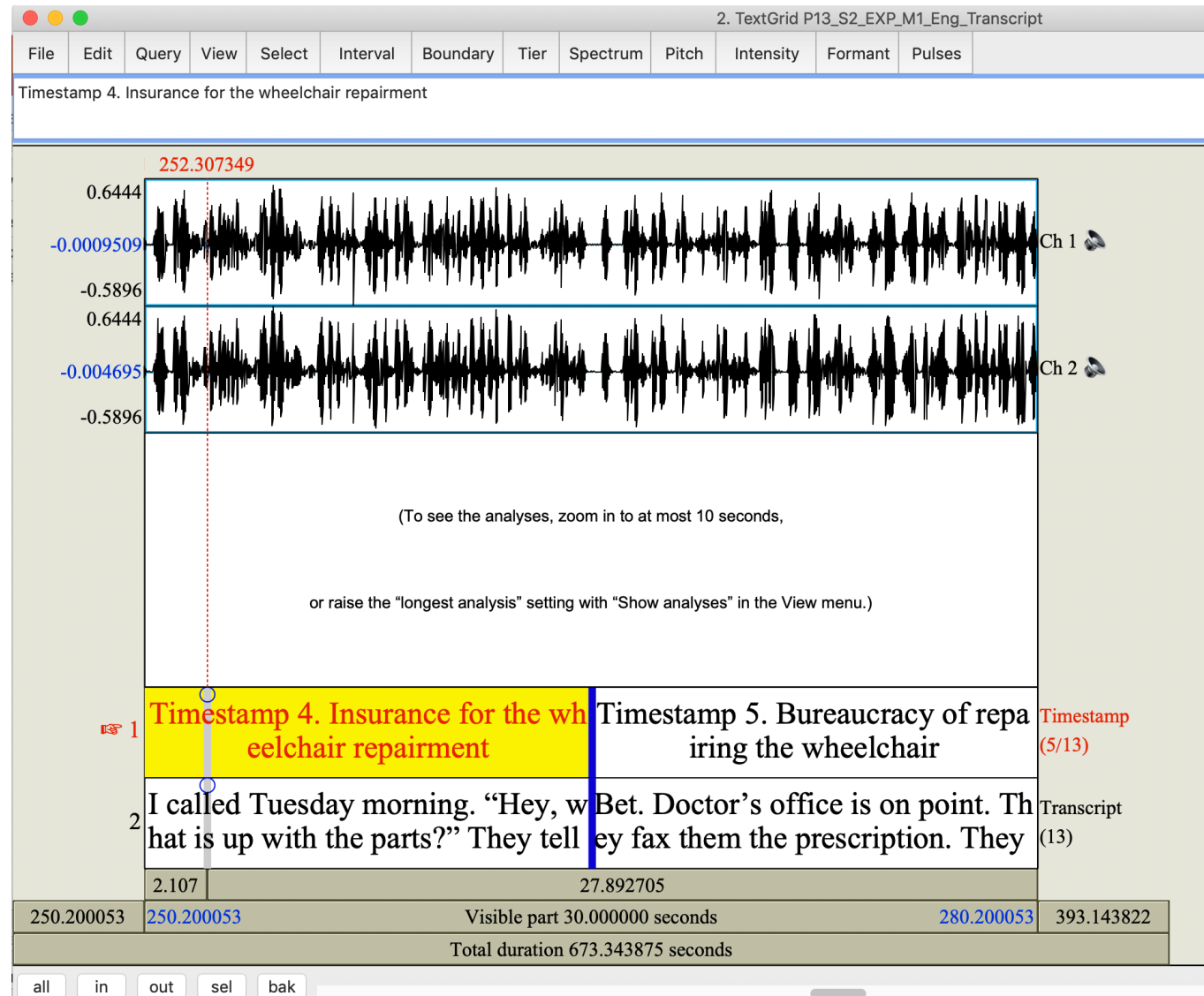


<https://github.com/TadasBaltrusaitis/OpenFace>

Praat

- Audio pitch (Hz)
- Audio intensity (dB)

- Run script to extract features (Khiet Truong)



Pattern library

- Sentiment polarity
- Sentiment subjectivity

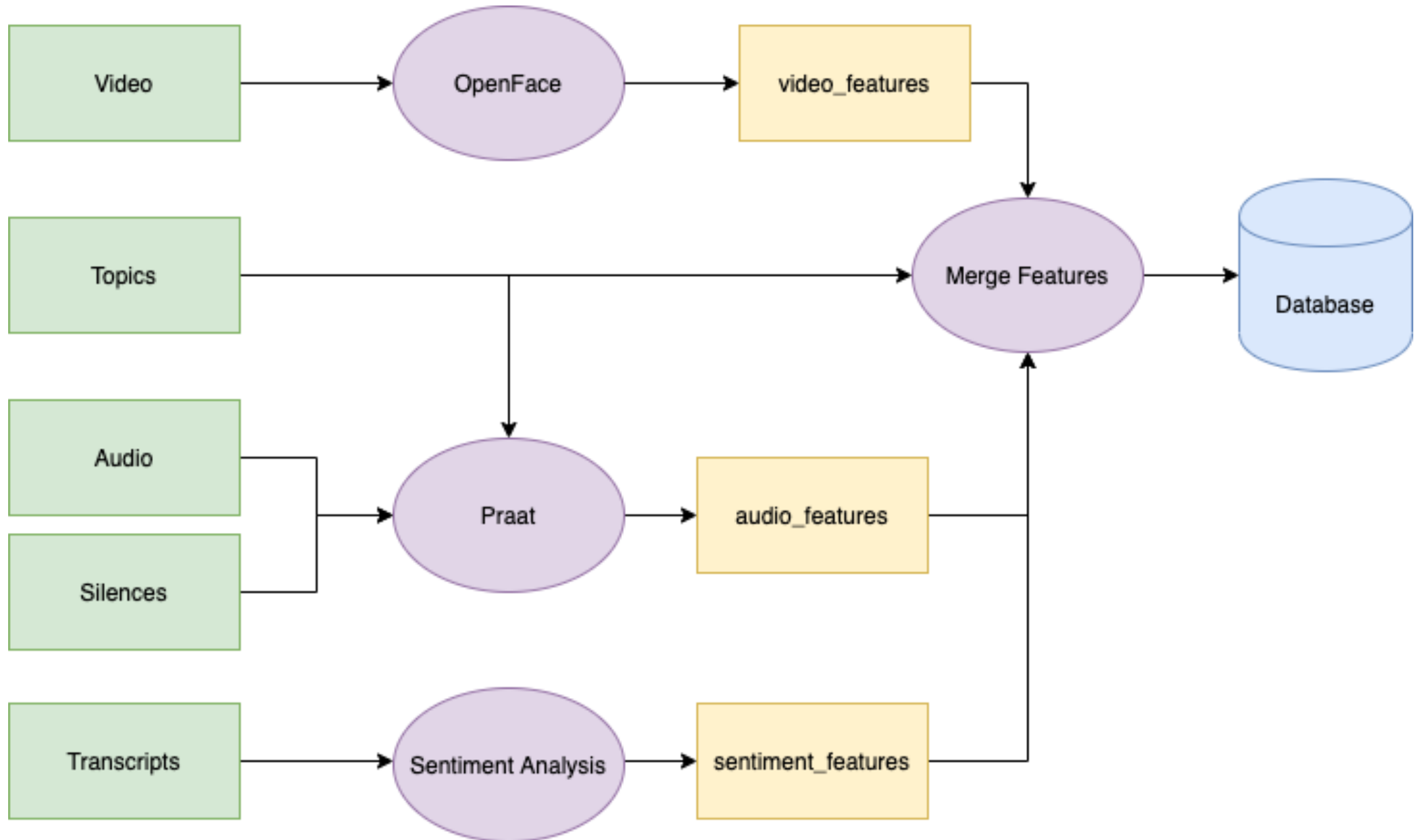
```
>>> from pattern.nl import sentiment
>>> print sentiment('Een onwijs spannend goed boek!')

(0.69, 0.90)
```

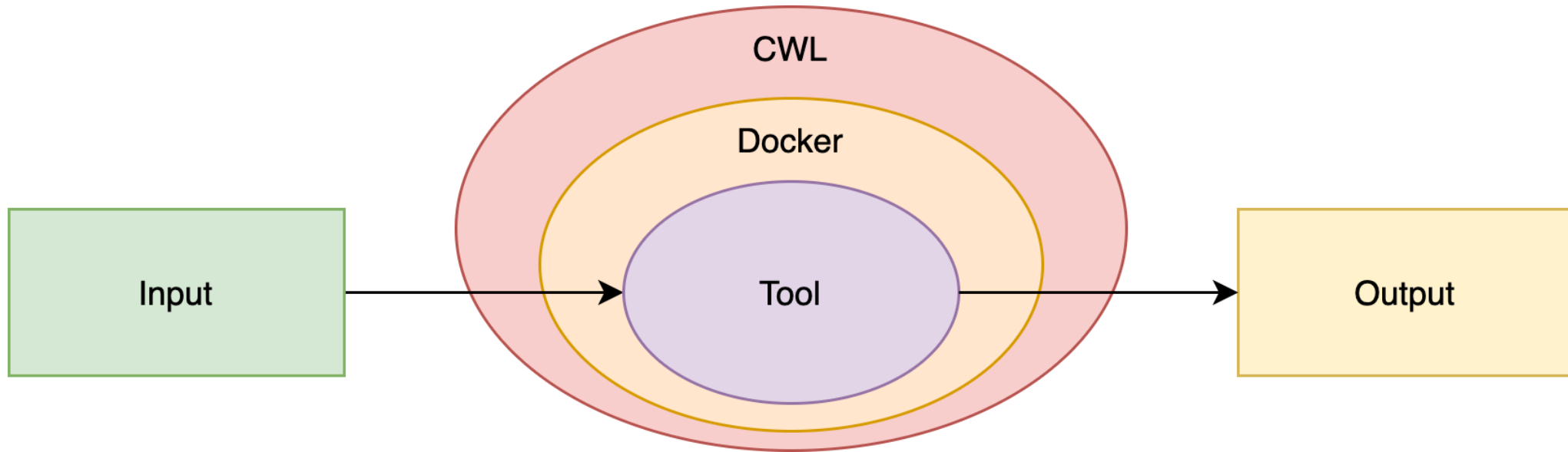


<https://www.clips.uantwerpen.be/pages/pattern> (is down?)
<https://www.clips.uantwerpen.be/clips.bak/pages/pattern-nl>
<https://github.com/clips/pattern/wiki>

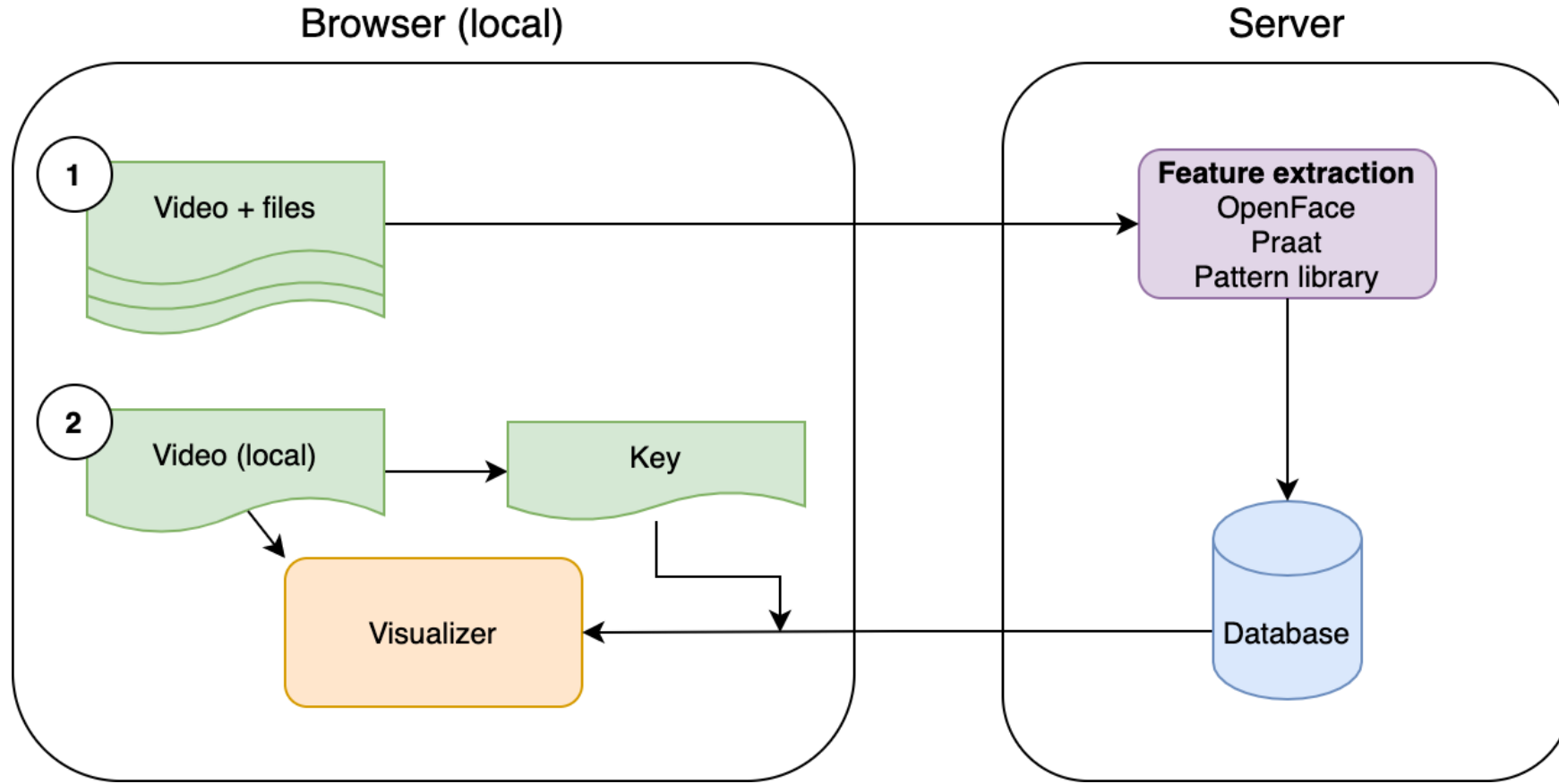
Feature extraction pipeline



Common Workflow Language + Docker



Setup overview



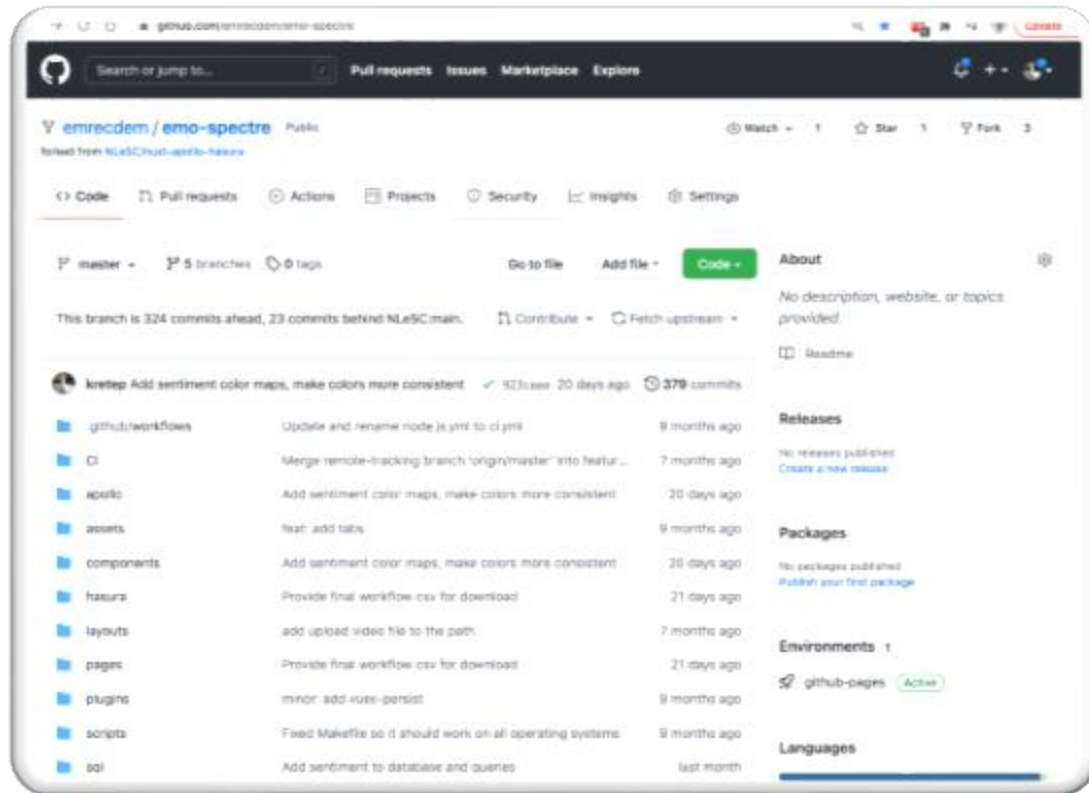
Choices made

- Web application
 - No need to install anything (except for Chrome...)
 - Share results
- Docker + CWL
 - Reproducibility
 - Reusibility
- Docker for deployment
 - Easy to set up on a server
- Open source
 - Possible to extend / reuse / maintain



Source code

<https://github.com/emrecdem/emo-spectre>
<https://github.com/emrecdem/erd-etl>



Contributors

eScience Research Engineers

Berend Weel

Jesus Garcia Gonzalez

Maarten van Meersbergen

Pushpanjali Pawar

Peter Kok

Power user

Deniece Nazareth

eScience Research Coordinator

Lars Ridder



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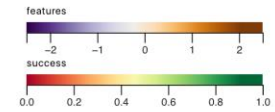
Lid Tightener(intensity) Nose Wrinkler(presence)

Nose Wrinkler(intensity) Upper Lip Raiser(presence)



Normalize

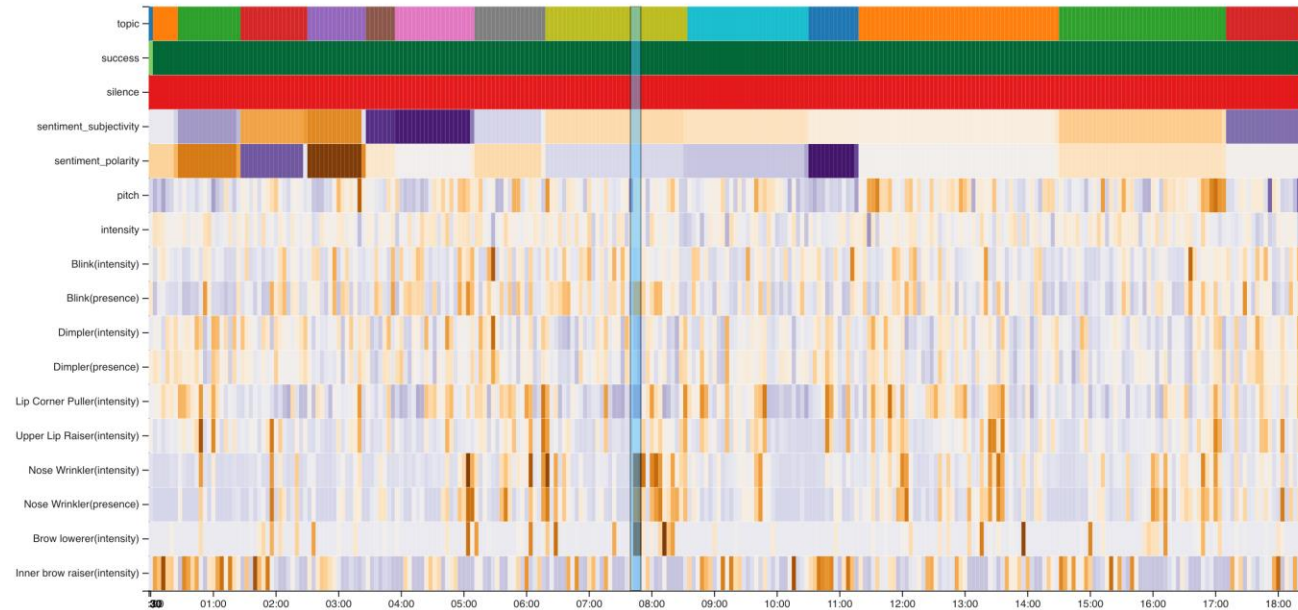
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silence

● false

● true



EXPORT TO CSV

Let's stay in touch



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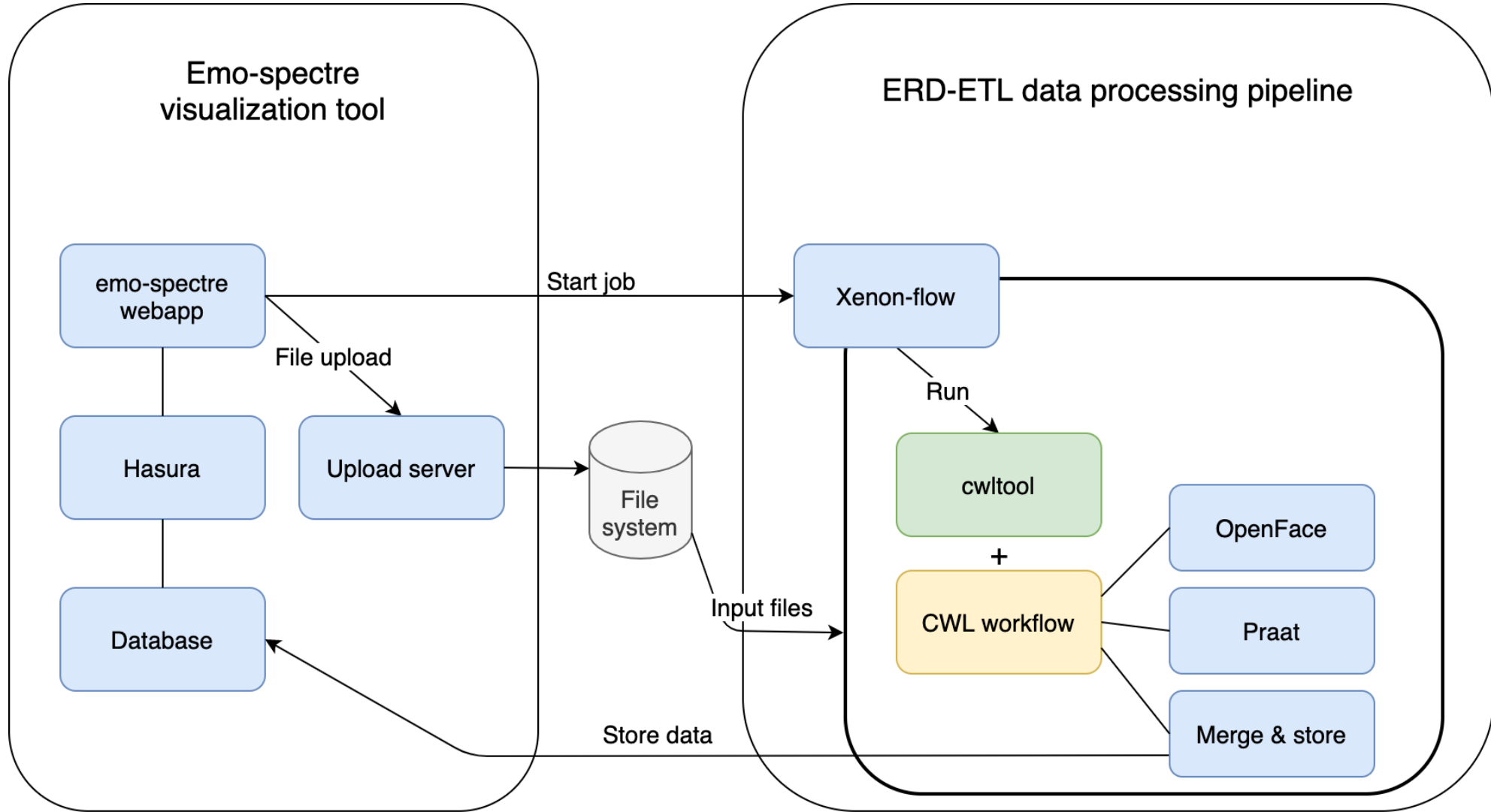
info@esciencecenter.com



+31 (0)20 460 4770

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Deployment architecture



Docker container Local application Script / config

