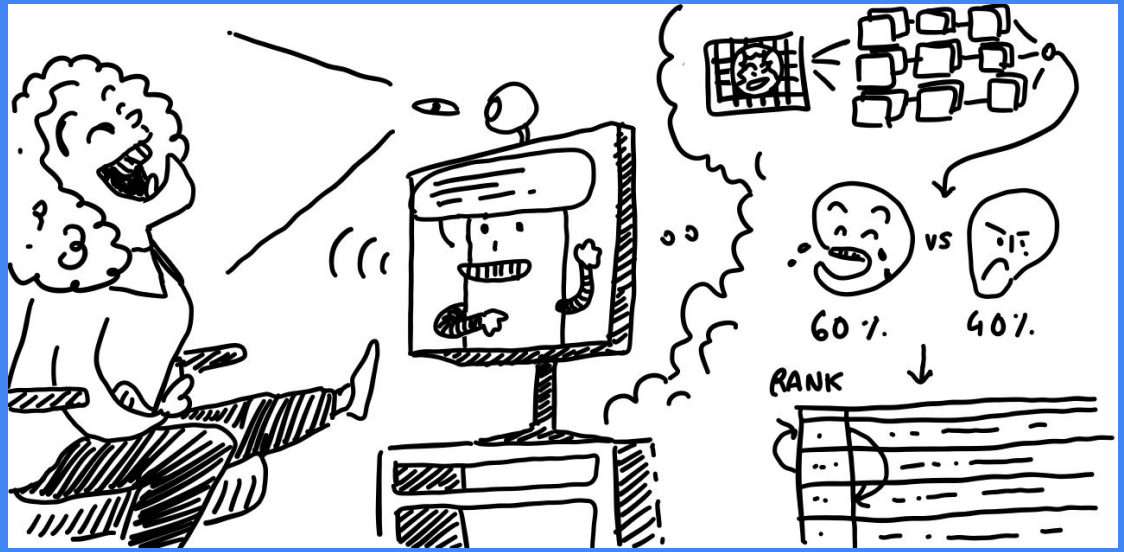


Can I joke on you?

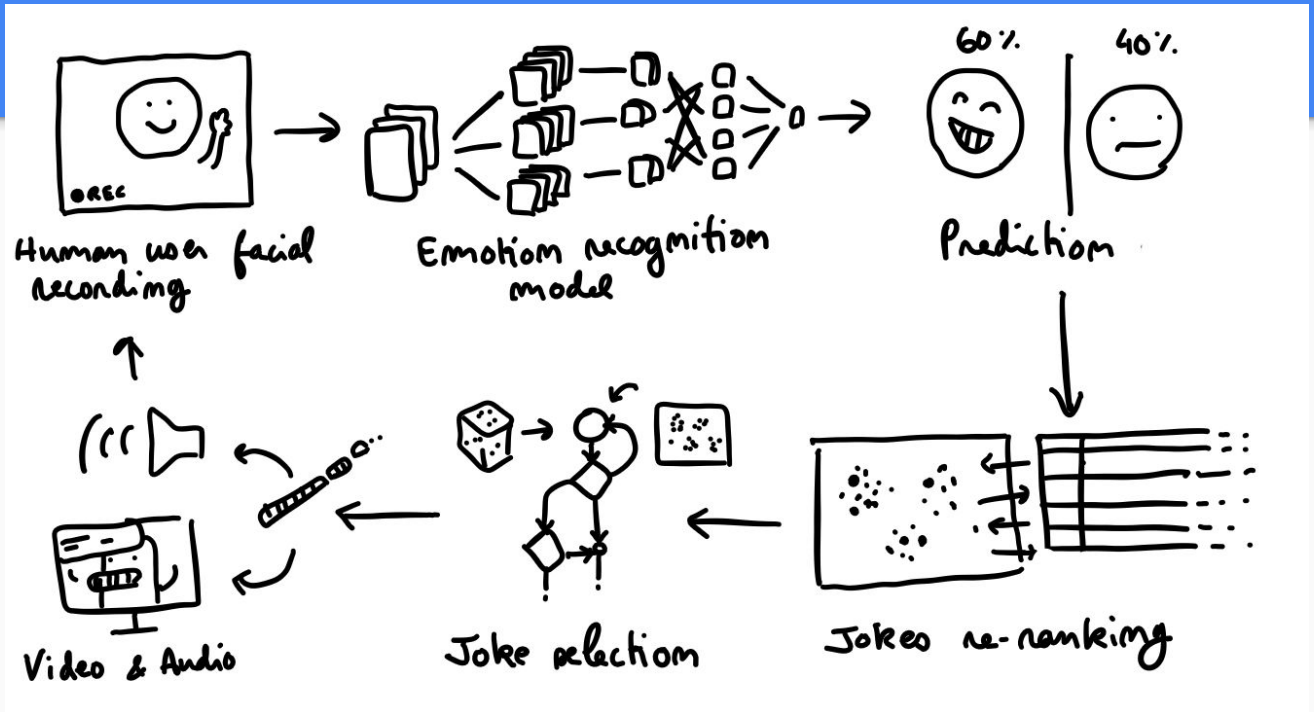
Anicet Nougaret, Lena Ebner, Jens De Bock

6/11/2023

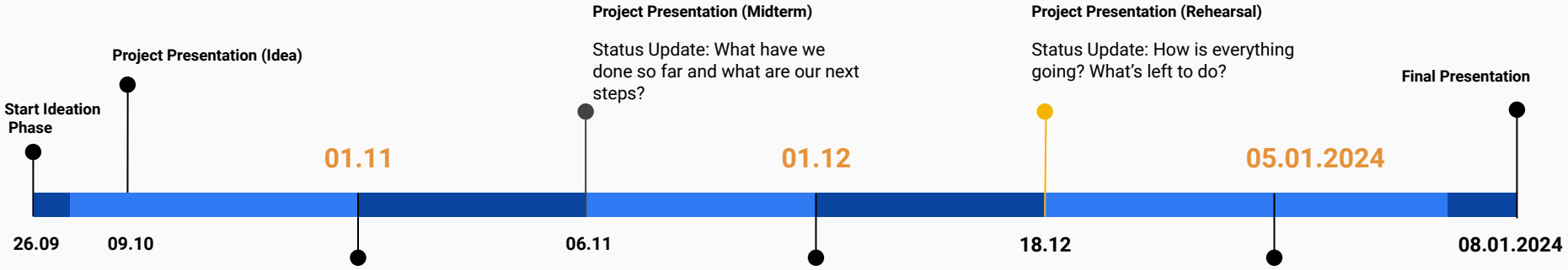
Recap

Idea

A robot that tells jokes to the user. Able to detect the user's facial expressions, he learns to pick jokes the user seems to like.



Planning



Create Basic Components

Find Emotion Dataset + Train CNN + Classification

Find Jokes Dataset + Train RS + Predict Jokes

Find UI Engine + Create UI Robot + User Interactions

Connecting Components

Connect Emotion with Jokes and UI Robot to a complete UX

Final Project

Improve individual components by finetuning models and UI

Conduct experiment and analyze results

Research Question

Research Question

Is a robot UI with recommender more fun to use than telling random jokes?

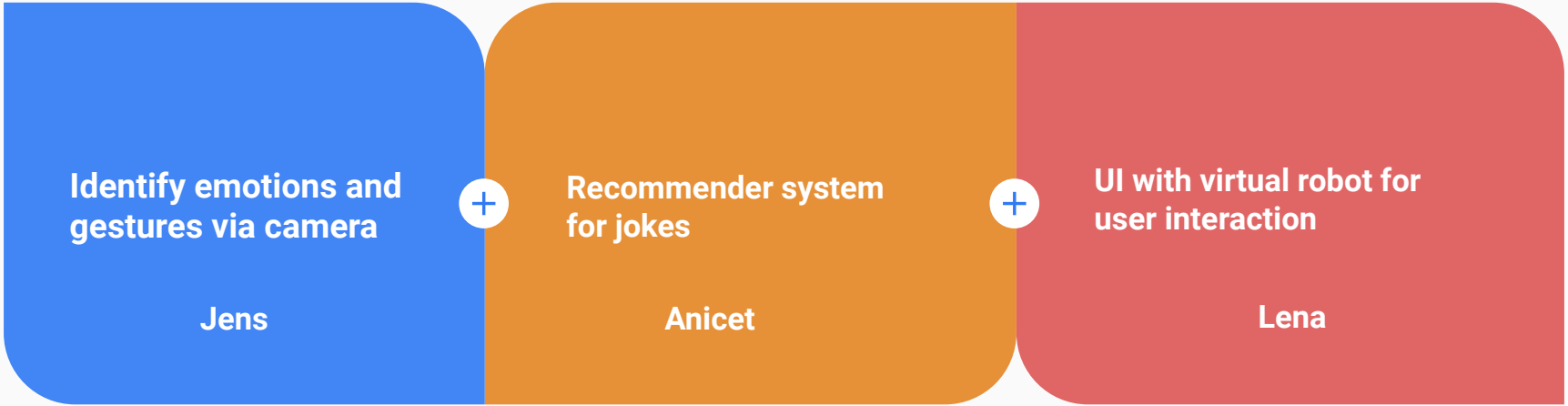
Variables

3 Variables

- Recommender is active or not (independent)
- Facial expressions (independent)
- User experience (dependent)

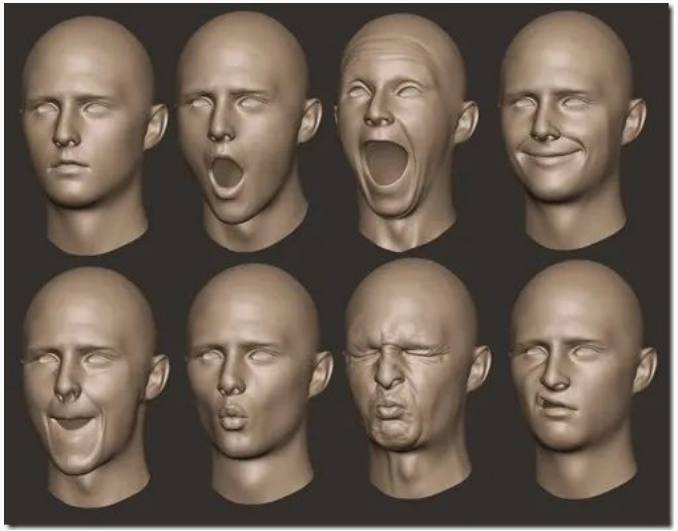
Status Update

Parts of the project

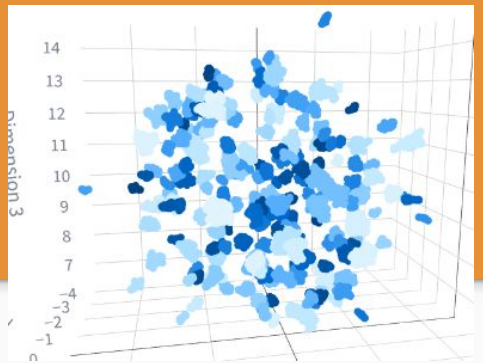


Emotion Detection

- No more usage of keypoints
- Use blendshapes to estimate laughing
- Can be used directly in the front-end
- 2 calibration phases
- Finetune and normalize output



Joke Dataset (updates)



- 30 semantic categories of jokes obtained via embeddings clustering
- Manually filtered down to 26 categories
- Jokes with URIs, weird characters filtered out automatically

Joke Recommender (new)

- Inspired by tabular Q-learning (Barto & Sutton, 1998) (learns a pool of favorite categories)
- Fast convergence in less than 30 jokes tested using a test UI
- Good at filtering out categories you don't like early

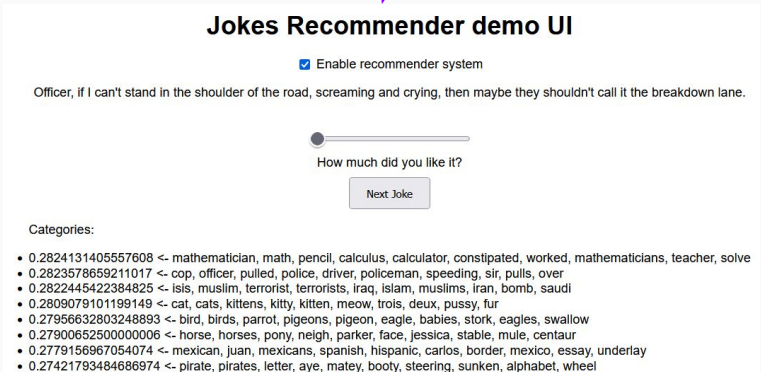
$$Q_{t+1}(u, c_t) \leftarrow (1-\alpha)Q_t(u, c_t) + \alpha R_t$$

$$Q^\star(u, c_t) = \mathbb{E}[R_t | u, c_t]$$

$$\pi^\star(u) = \max_c \mathbb{E}[R | u, c]$$

	$c=1$	$c=2$	...	$c=C$
u = 1	$Q^\star(1,1)$	$Q^\star(1,2)$	...	$Q^\star(1,C)$
u = 2	$Q^\star(2,1)$	$Q^\star(2,2)$	...	$Q^\star(2,C)$
...	...	...	...	...
u = U	$Q^\star(U,1)$	$Q^\star(U,2)$	...	$Q^\star(U,C)$

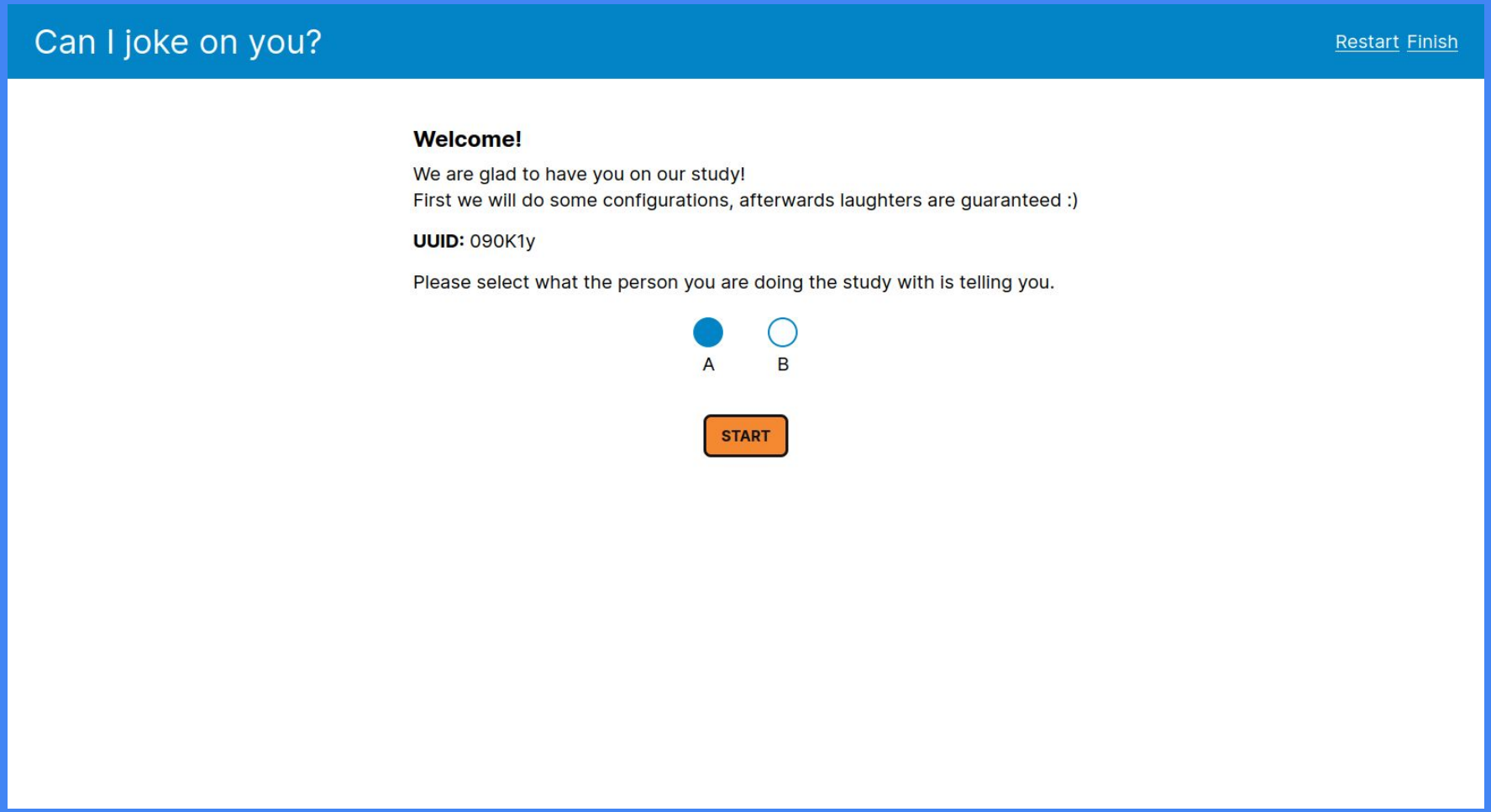
$$\forall c_i \in Q_u^{\text{sorted}}, \ \Pr(\pi(u) = c_i) = \varepsilon I(i < \theta)\frac{i}{\theta} + (1-\varepsilon) I(i \geq \theta)\frac{i-\theta}{C-\theta}, \quad \text{with } \theta = 0.8 \times C$$



Robot UI

- Create UI Flow for Study Procedure
- Integrate Emotion Recognition and Smile Detection in UI with Mediapipe
- Communicate with Recommender
- Implemented Logging of smile detection for each user
- Deployment on VM to be reachable by domain
  https://joke.servegame.com/

Demo


Can I joke on you?
Restart Finish
Welcome!
We are glad to have you on our study!
First we will do some configurations, afterwards laughters are guaranteed :)
UUID: 090K1y
Please select what the person you are doing the study with is telling you.
A
B
START

Can I joke on you?

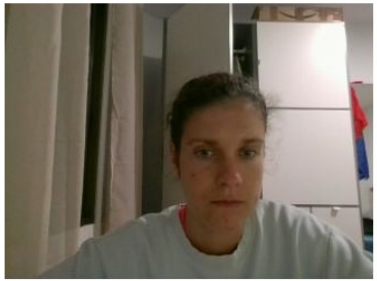
Restart Finish

Calibration Phase:

Before you can start we do a short calibration of your face.
Please make sure your face is fully covered by your camera.
Additionally we ask you to keep a **NEUTRAL** face while calibrating.

Press **START NEUTRAL CALIBRATION** whenever you are ready.

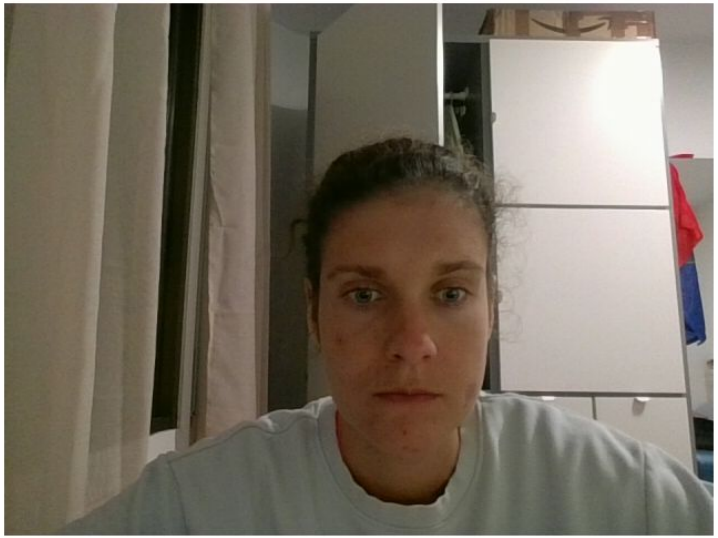
Start NEUTRAL Calibration



Can I joke on you?

Restart Finish

We are now doing the calibration on your face.
Please just try to keep a **NEUTRAL** face until we are finished.
Seconds: 8



Give us your biggest smile :)

As last step we need your biggest smile for calibrating your face.
Again please make sure your face is fully covered by your camera.
Additionally we ask you to keep **SMILING** as big as you can while calibrating.

Press **START SMILE CALIBRATION** whenever you are ready.

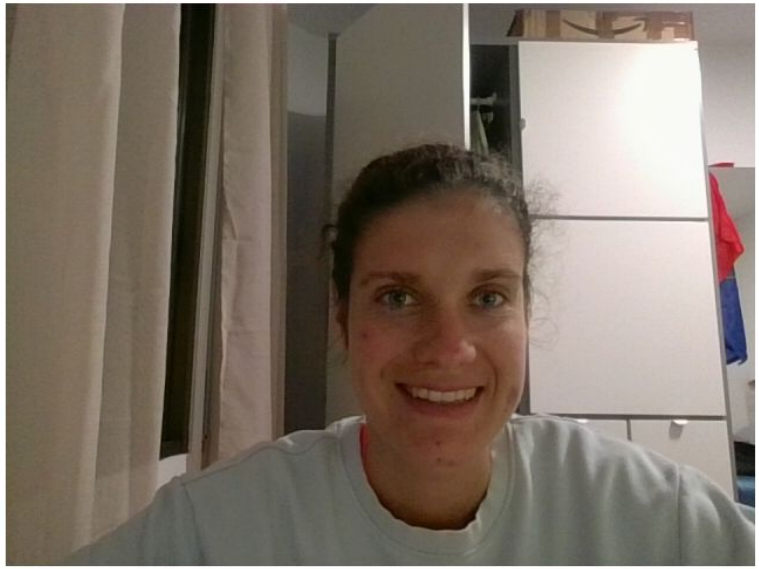
Start Smile Calibration

Can I joke on you?

Restart

swappy

We are now doing the **SMILE** calibration on your face.
Please SMILE as big as you can until we are finished.
Seconds: 7



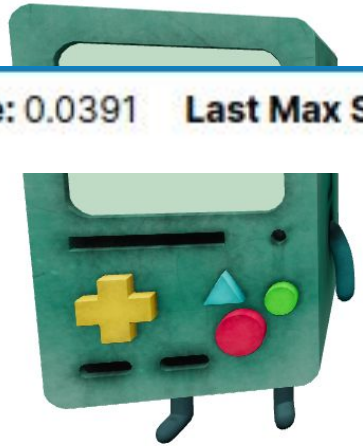
Can I joke on you?

Restart Finish

Toggle Debug Info

30 Days of Christmas Jokes
Why was Santa's little helper sad?
Because he had low ELFesteem

⏩ NEXT JOKE
▶ TELL ME JOKE
🔊 UNMUTE



Smile Degree: 0.0391 **Last Max Smile Degree:** 1.0000 Stop Prediction Predict

Thank you!

Thank you very much for participating in our user study!
For our evaluating we kindly ask you to fill out the following questionnaire:

Take Questionnaire

Evaluation

Evaluation

- Prepared all files needed for evaluation
  - Godspeed questionnaire (without Antrophism)
  - Logs
  - Consent for participation
  - Study procedure
  - Excel for manual joke likeliness detection by us
- Started with evaluation on the weekend
- Doing evaluation with ~ 20 participants

Evaluation

Results we want to evaluate

1. **How well learns** the recommender system
2. Smile detection **accuracy**
3. **User experience** differences

Questions?
Feedback?