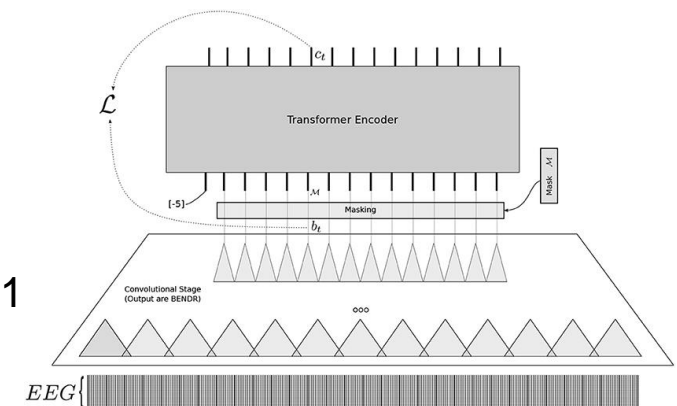
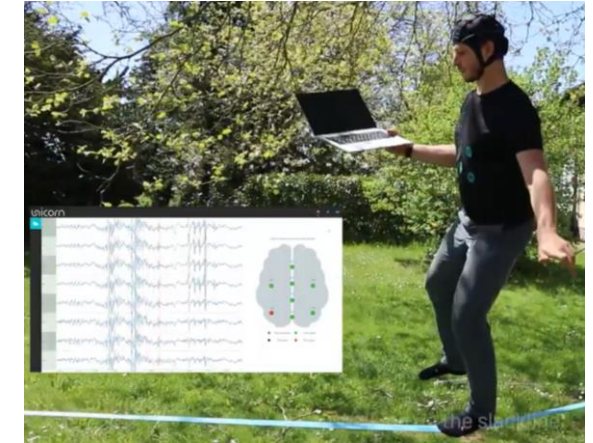


Casual Brain Activity Data Recording

- Most recordings of brain activity data take place in the laboratory
 - Highly controlled, but also unrealistic and not generalizable
 - Small amounts of well-labeled data → does not scale
- Alternative: Casual recording of brain activity data
 - Completely uncontrolled, during everyday activities
 - No or very weak labeling
 - Leveraging self-supervised learning methods
- **Your thesis:** Collect and evaluate such data
 - Set up sensors, design data collection protocol „in the wild“
 - Apply state-of-the-art machine learning for classification
- Contact: Dr. Felix Putze, felix.putze@uni-bremen.de or Discord: [felix.putze#871](#)



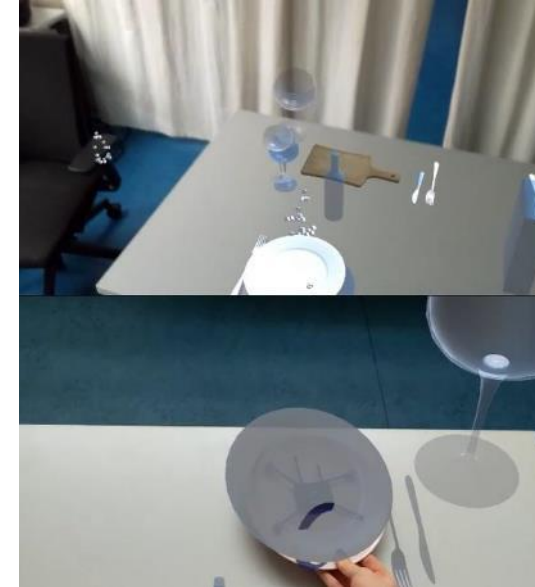
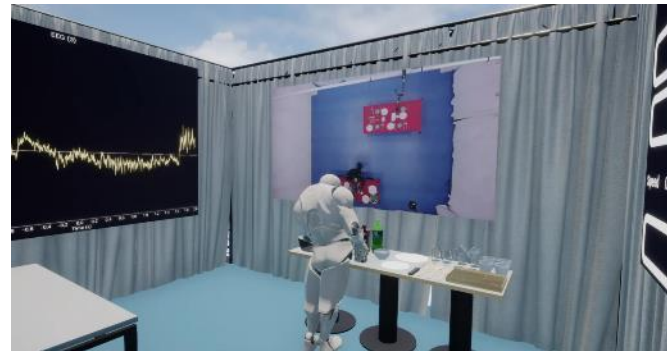
Representation Learning for Cognitive Modeling

- Representation learning: Automatically finding a compact, latent representation of high-dimensional input
 - Retaining important semantics and data characteristics
 - Input: video, text, biosignals, graphs, ...
- At the core of recent machine learning advances (Transformers, Large Language Models, DALL-E 2, ...)
- **Your thesis:** Apply representation learning for modeling context and cognition in Human-Computer Interaction:
 - Representing context from video recordings of Augmented Reality device
 - Representing neural data from EEG for Brain-Computer Interfaces
 - Representing semantic concepts for creative idea generation
- Contact: Dr. Felix Putze, felix.putze@uni-bremen.de or Discord: felix.putze#8717



Augmented/Virtual Reality for Cognitive Science

- Motivation 1: In Augmented and Virtual Reality, we can create realistic, but controllable experiments to **study human behavior and cognition!**
- Motivation 2: AR/VR can benefit from cognitive modeling to **adapt its user interfaces**



- **Your thesis:** Create AR/VR applications in the context of cognitive science, e.g.:
 - Study in VR how different impairments influence how people solve a task
 - Create an AR application that tracks the wearer's state of attention and adapts it

→ Contact: Dr. Felix Putze, felix.putze@uni-bremen.de or Discord: felix.putze#8717