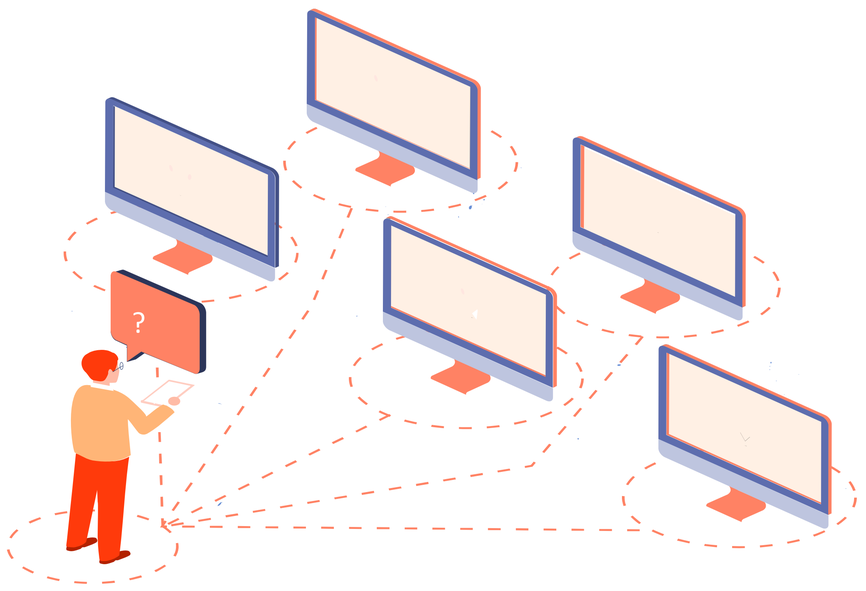
Sense the Classroom

Krist Shingjergji, Deniz Iren, Corrie Urlings, and Roland Klemke
krist.shingjergji@ou.nl

Scan the Project plan here!

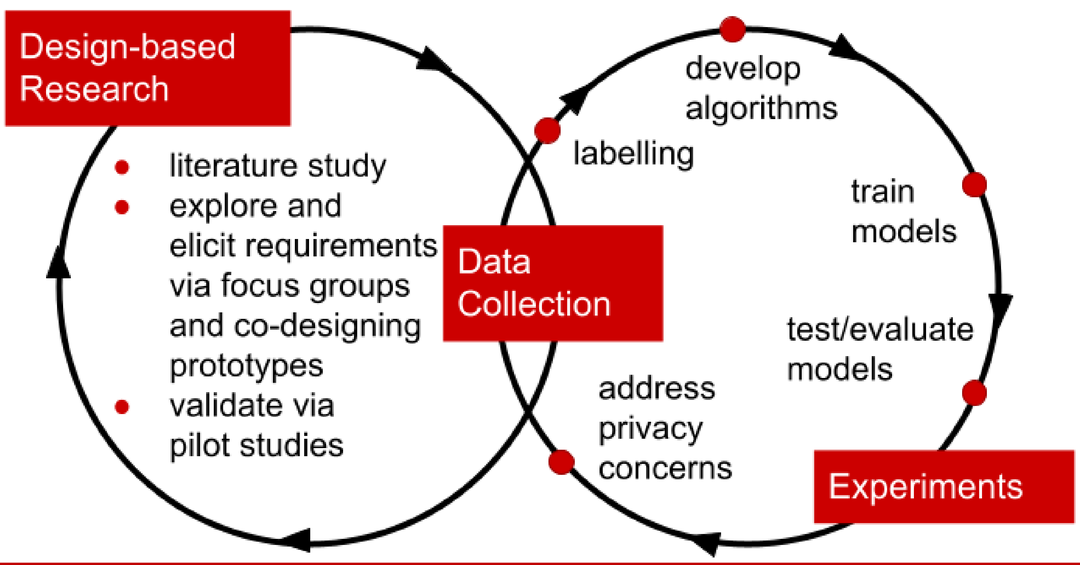
1. Introduction & Motivation

- In online classrooms teachers have a **lack of understanding** of how the students are doing, missing the opportunity to adjust their teaching on time and **improve the learning experience** [1].
- ***Learning-centered affective states* are** the psychological, physiological, and emotional states that relate to the learning experience of students.
- We propose to **develop** a system that detects students' relevant ***learning-centered affective states* in a privacy preserving manner** and **informs teachers accordingly** in an actionable way.



2. Methodology

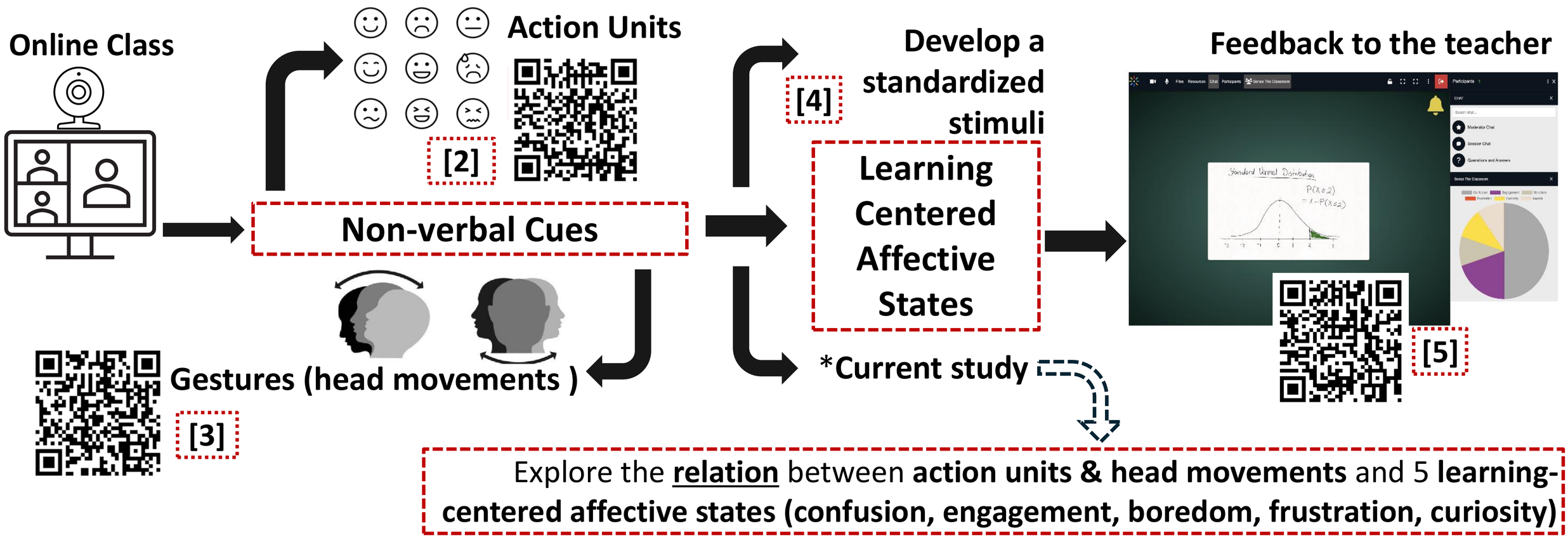
2.1 Research Approach



2.2 Research Questions

(RQ1.) What are the **specific non-verbal feedback needs** of teachers and students in online lectures?
(RQ2.) How can we **automatically detect non-verbal cues** and **(RQ3.) translate them to learning-centered affective states** in online, synchronous, education?
(RQ4.) How can **we present this information to teachers** in real-time so that they can take actions to positively influence learning?
(RQ5.) How can we design a system that is **ethically sound**, respects **privacy concerns**, and keeps **all collected data secure**?

3. Research Plan & Outcomes



4. Discussion

- The outcomes of the experiments will allow us to gain a deeper understanding on how **learning-centered affective states** are indicated by observable non-verbal cues, and how these states can be related to an effective learning experience.
- To protect the privacy of students we design core **privacy-preserving measures** to shape our research around them. The training data will be collected anonymously with no possibility to link to individuals.

References

[1] Bahreini, K., Nadolski, R., & Westera, W. (2016). Towards multimodal emotion recognition in e-learning environments. Interactive Learning Environments, 24(3), 590-605.
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[3] Iren, D., Shingjergji, K., Böttger, F., Urlings, C., Osinga, J. M., Van De Goor, S., ... & Klemke, R. (2023, March). Augmented Reality and Affective Computing for Nonverbal Interaction Support of the Visually Impaired. In *2023 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)* (pp. 360-363). IEEE.
[4] in review
[5] Shingjergji, K., Urlings, C., Iren, D., & Klemke, R. (2024, March). Shaping and evaluating a system for affective computing in online higher education using a participatory design and the system usability scale. In *Proceedings of the 14th Learning Analytics and Knowledge Conference* (pp. 382-391).