ENHANCING SURGICAL TEAM COLLABORATION AND SITUATION AWARENESS THROUGH MULTIMODAL SENSING

Arnaud Allemang--Trivalle

Haptic Intelligence Department, Max Planck Institute for Intelligent Systems, Stuttgart, Germany IMT Atlantique, Lab-STICC, UMR CNRS 6285, Brest, France **aat@is.mpg.de**



ABSTRACT

This research adopts a holistic view of surgery, emphasizing the vital roles of all operating room (OR) personnel and the importance of their interactions and shared awareness in delivering quality patient A two-phase approach is proposed: the care. first phase focuses on the design of a multimodal **platform** to monitor OR team members and create new metrics for collaboration and situation awareness using synchronized recordings of various signals. The second phase centers on developing intuitive dashboards to help surgeons review procedures and identify adverse events. This research seeks to enhance collaboration, increase situation awareness, and reduce surgical adverse events, promoting a transformative and inclusive approach to surgery.

BACKGROUND

- Situation awareness (SA) is an essential construct that impacts decision-making and performance in surgery, which demands robust cognitive skills.
- Monitoring collaboration is crucial in surgery where responsibilities and knowledge

RESEARCH QUESTIONS

(RQ1) How to manage ethical and technical challenges in OR multimodal data collection?

(RQ2) How to quantify situation awareness and collaboration in surgical teams?

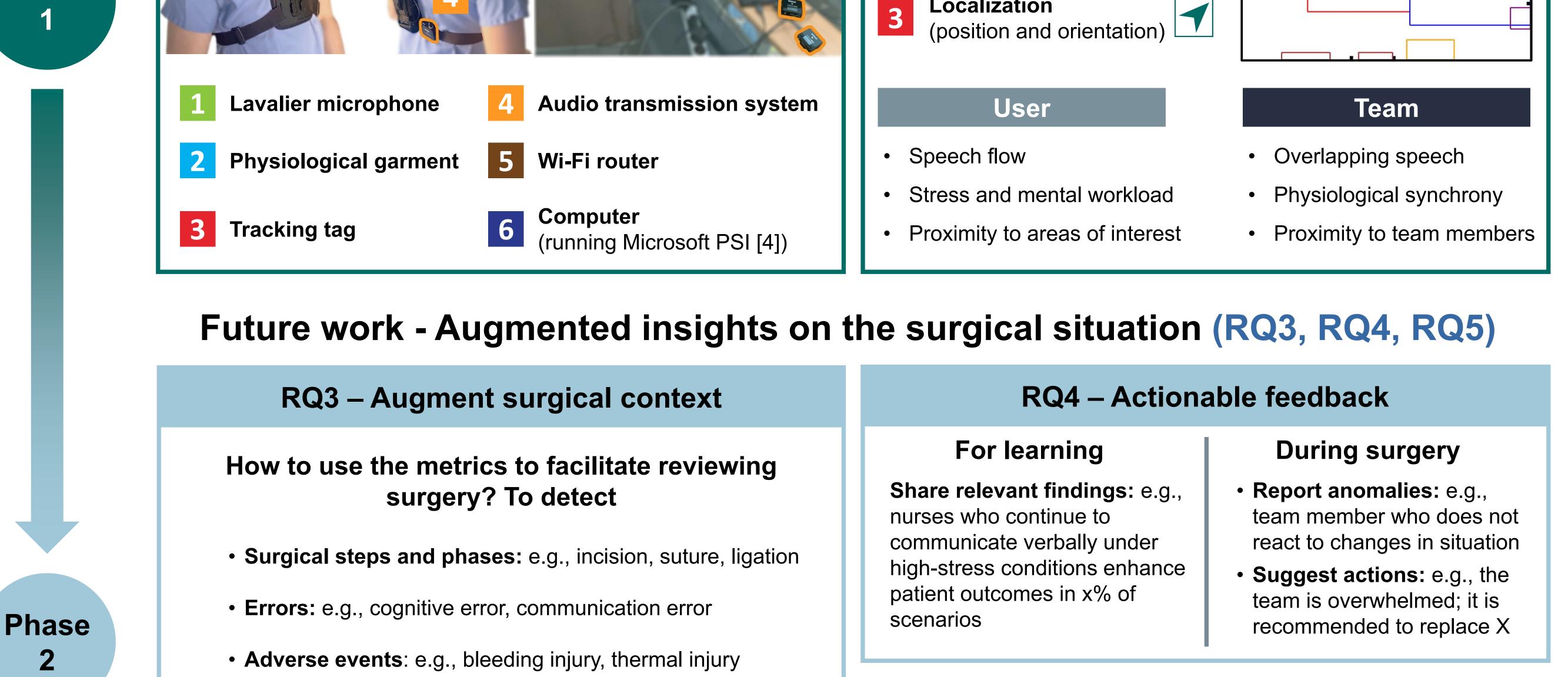
(RQ3) How to create dashboards for effective surgical data analysis?

of the situation are shared among surgeons, anesthesiologists, and nurses [1, 2].

• Existing methods for evaluating SA and collaboration, such as questionnaires and expert ratings, are unsuitable or unreliable [3].

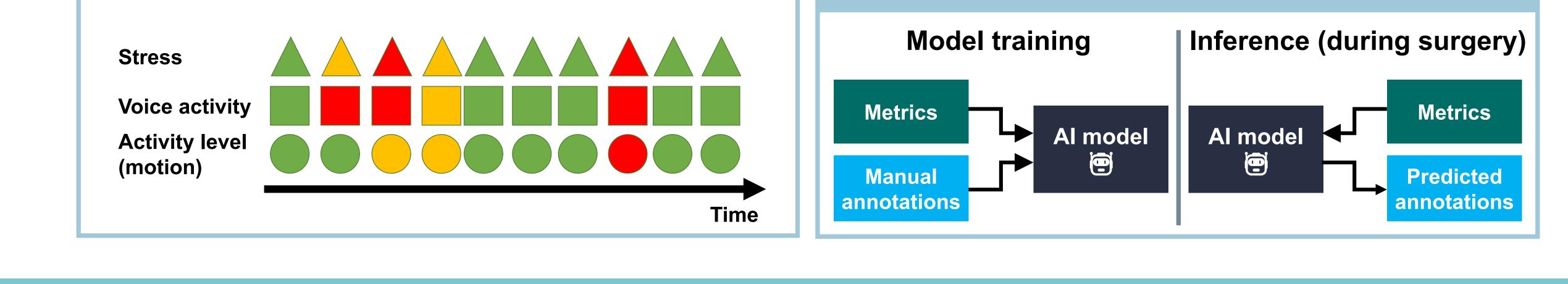
(RQ4) How to turn data insights into actions for safer surgeries?

(RQ5) How to build AI that predicts errors and adverse events in surgery?



Proposed solution - Augmenting the timeline

RQ5 – Al





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[4] Dan Bohus, Sean Andrist, Ashley Feniello, Nick Saw, Mihai Jalobeanu, Patrick Sweeney, Anne Loomis Thompson, and Eric Horvitz. "Platform for Situated Intelligence" (2021).