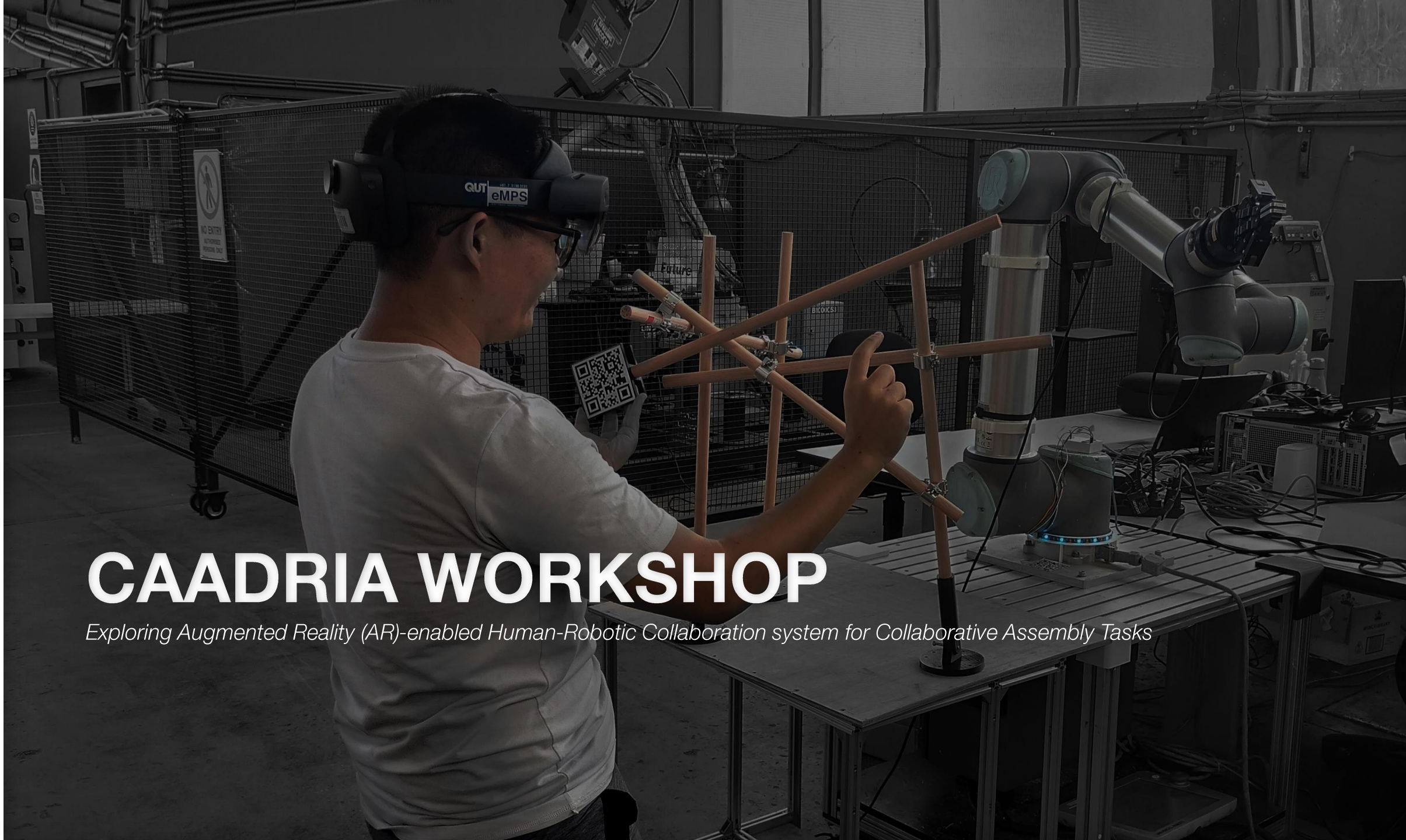

CAADRIA WORKSHOP

Exploring Augmented Reality (AR)-enabled Human-Robotic Collaboration system for Collaborative Assembly Tasks

WORKSHOP FACILITATORS

Wei Win Loy
Ph.D Candidate
School of Design
Queensland University of Technology (QUT)

Shabnam Lotfian
Ph.D Candidate
School of Architecture and Built Environment
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Ph.D Candidate
School of Architecture and Built Environment
Queensland University of Technology (QUT)

WORKSHOP RESOURCES

Github (Workshop Resource)
https://github.com/LoyWeiWin/AR-HRC_CAADRIA2024_Workshop

Discord (For Communication)
https://discord.gg/n4jzrdYJky

LEARNING OBJECTIVES

- Participants will learn the basic concepts of human-robot collaboration (HRC)
- Participants will learn about the intricacies surrounding collaborative assembly routines (either with human collaborators or robotic arms).
- Participants will learn to author and prototype robotic workflows and simulations
- Participants will be able to think independently about novel robotic workflow concepts
- Participants will be able to experimentally validate their concepts in a full-scale prototype.

Image: Asking the cooperative robotic arm, UR10 to hold my wooden block. **Source:** Author, 2023.

RESEARCH MOTIVATION

"How collaborative robots can be integrated into a flexible design-fabrication scenario via AR interface to provide a helping hand to creative architectural designer(s)?"

Image: Asking the cooperative robotic arm, UR10 to hold my wooden block. **Source:** Author, 2023.

RESEARCH CONTEXT

Why Collaborative Robot? Why Augmented Reality?

The primary goal of this module is to investigate the capabilities of augmented reality (AR) in facilitating human-robot collaboration (HRC) within fabrication-centric design methodologies, specifically emphasizing collaborative assembly tasks.

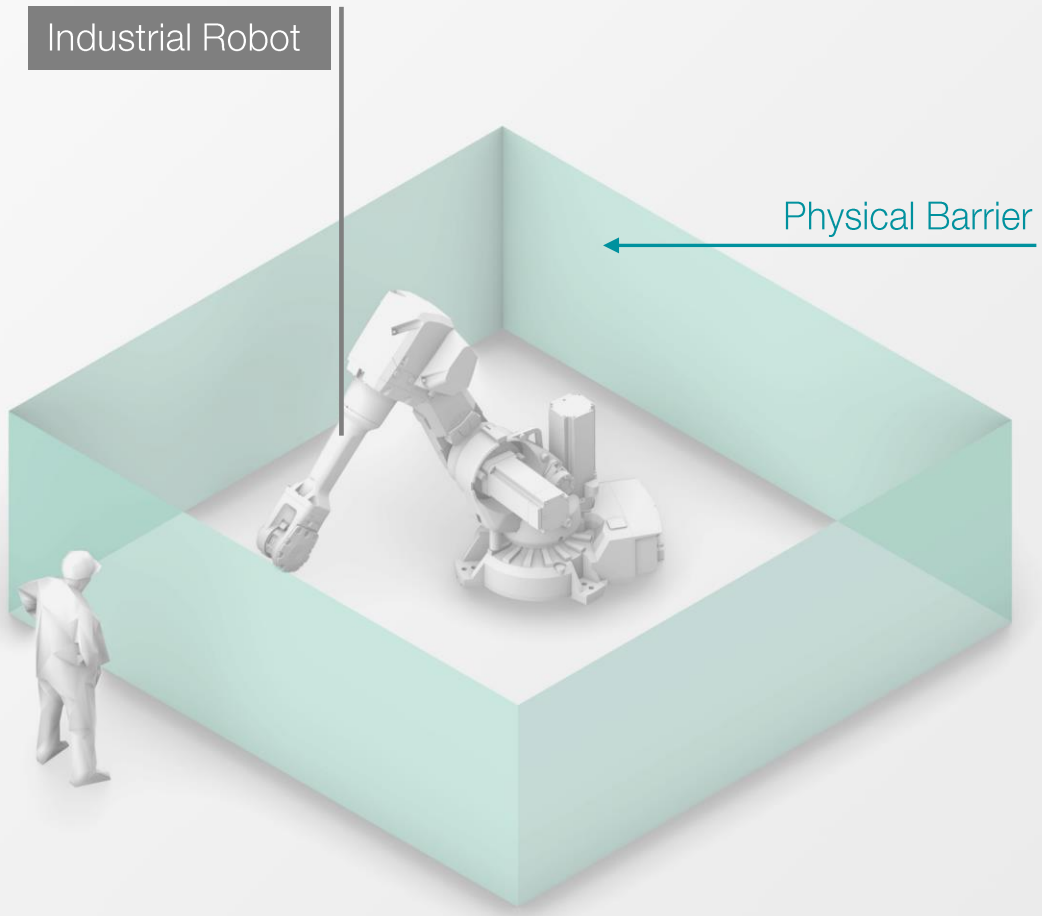

Image: The setout of industrial robotics often prohibit working closely with human operators.
Source: Author, 2023.

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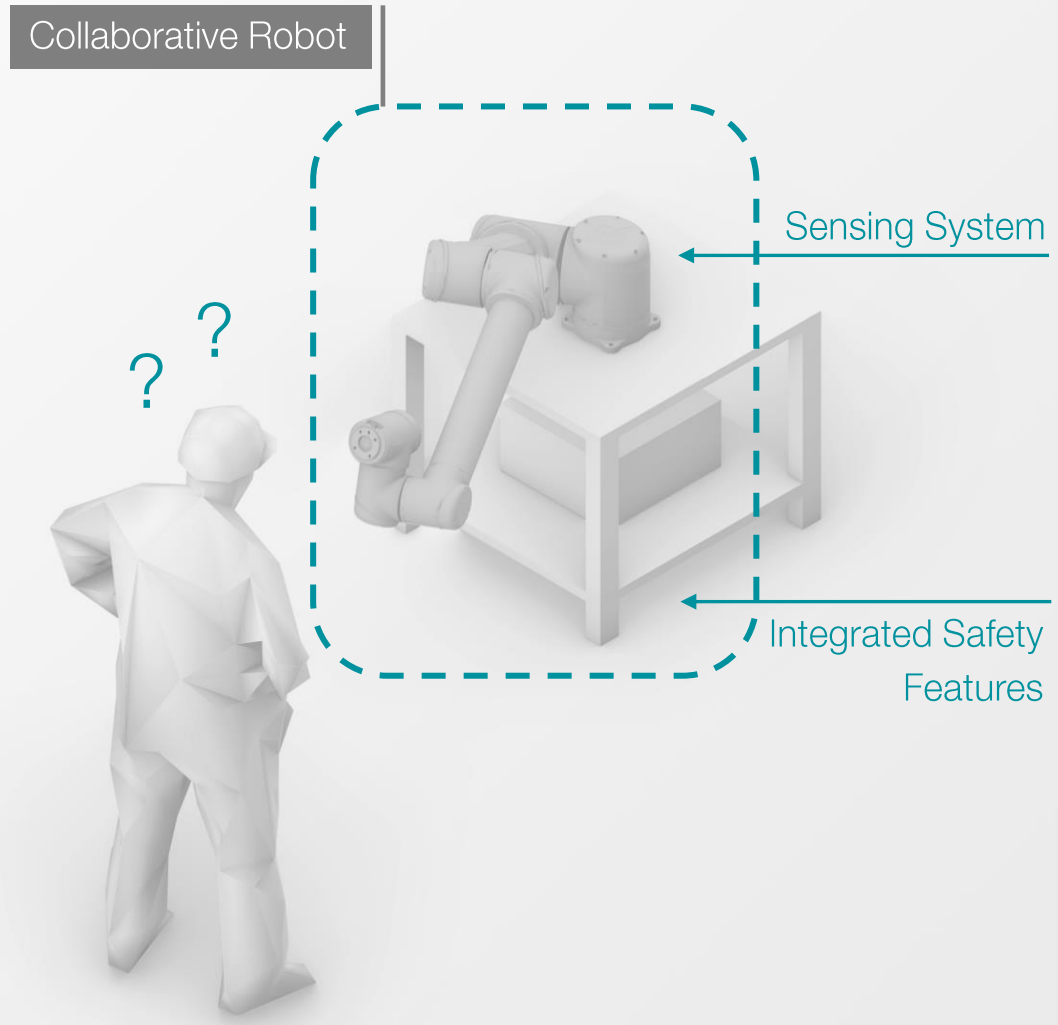

Image: Collaborative robots are designed to enable human operators to work in close proximity
Source: Author, 2023.

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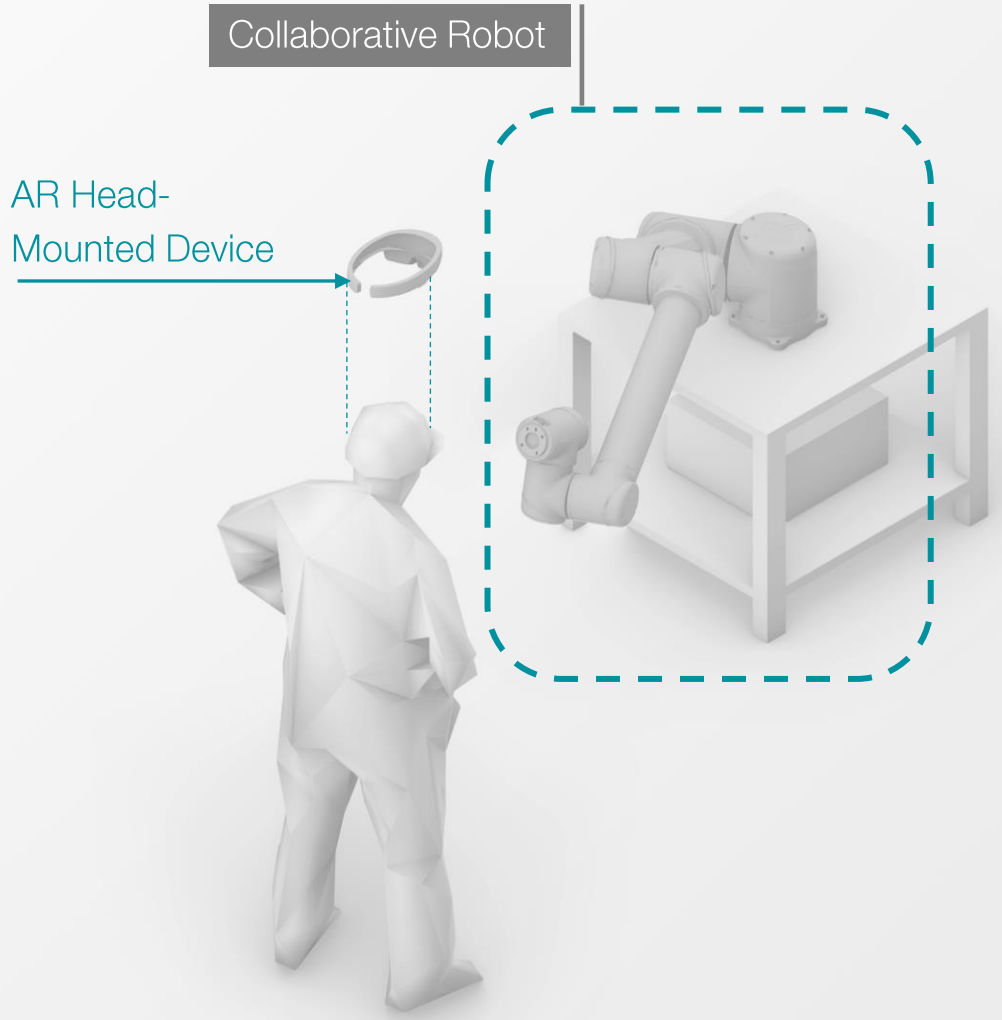

Image: Explore how AR devices can be used to explore with cobot.
Source: Author, 2023.

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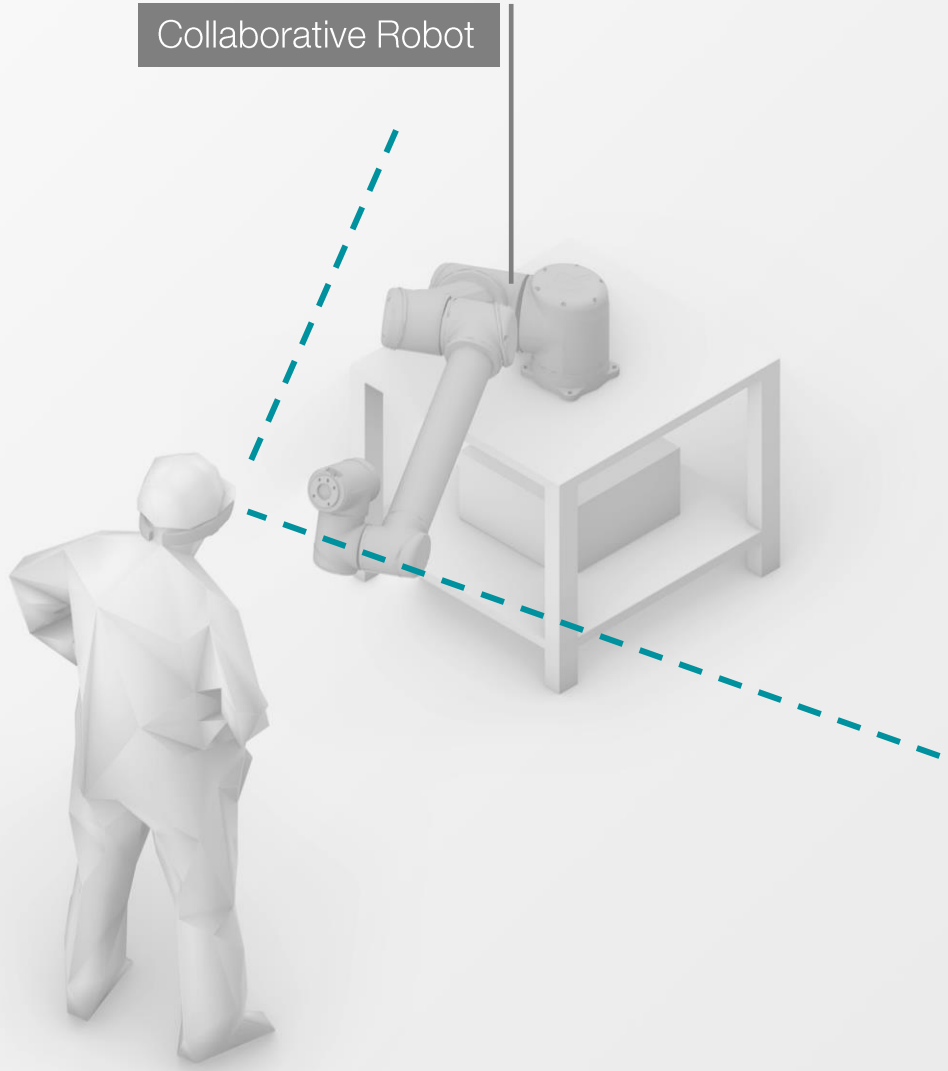

Image: Explore how AR devices can be used to explore with cobot.
Source: Author, 2023.

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Image: Dr. Madeline Gannon interacts with large-scale robotic arm.
Source: Instructables, 2018.

CAADRIA WORKSHOP SCHEUDLE

Augmented Reality (AR) – enabled Human-Robot Collaboration (HRC)

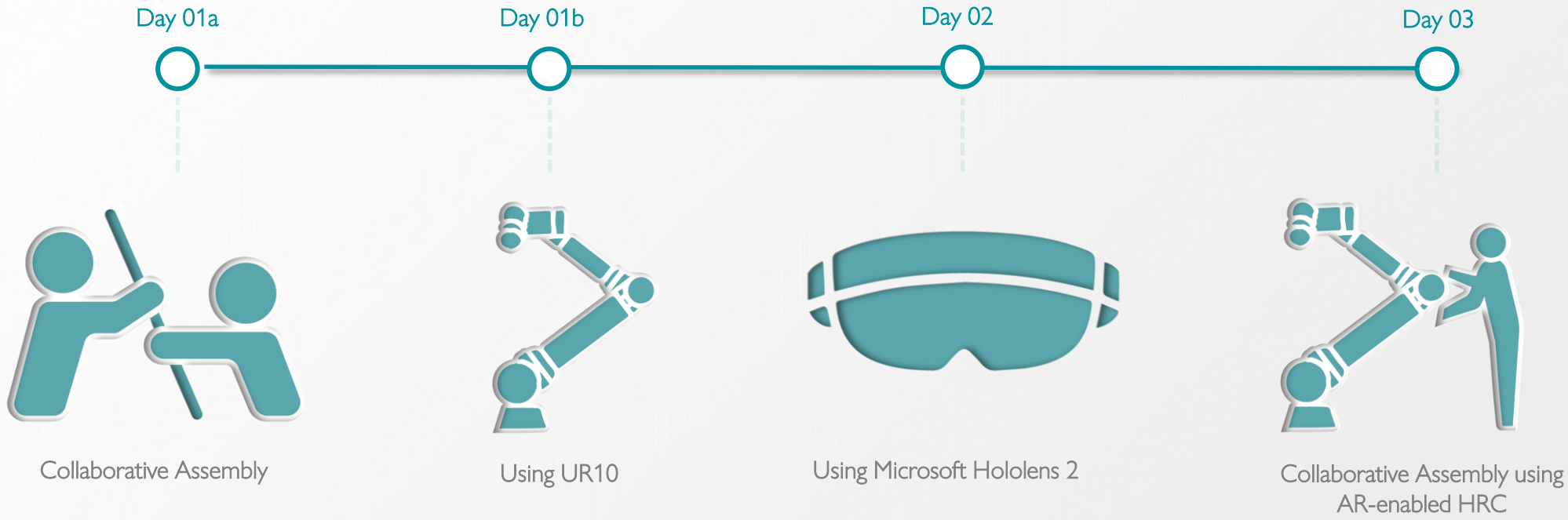

Image: Overall Schedule for CAADRIA Workshop 2024 – AR-enabled HRC for Collaborative Assembly Tasks. **Source:** Author 2024.

CONSENT FORM

Your participation is completely voluntary** and agree for the CAADRIA workshop to be audio and video recorded.

** If you wish to withdraw your consent to participate please ask the research team for the withdrawal of consent form. Your withdrawal will not jepardise your relationship with QUT.

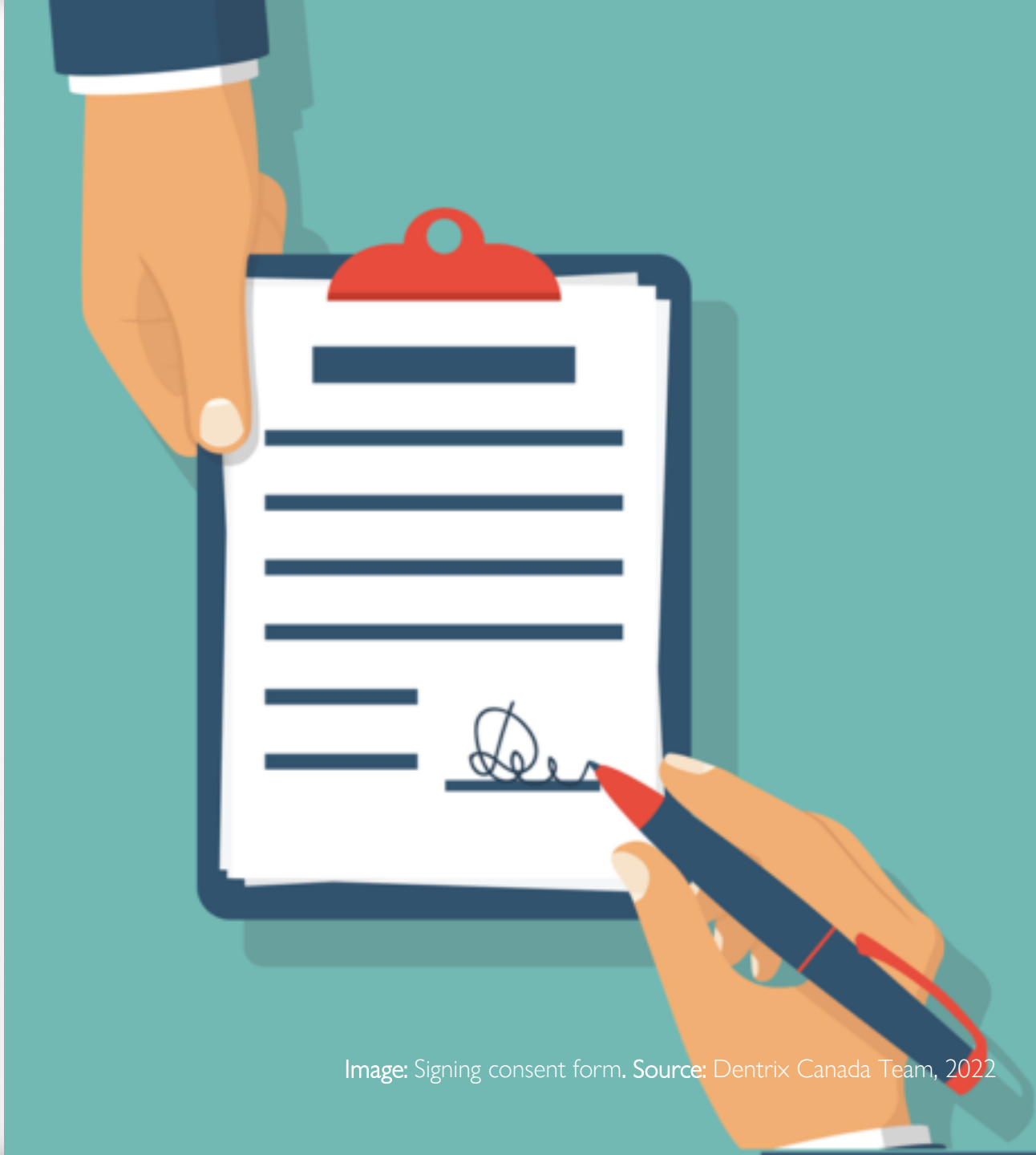

Image: Signing consent form. **Source:** Dentrix Canada Team, 2022

BREAK & WILL BE BACK

10 minutes (make sure you have stay hydrated)