Bazkaria: Eating Together Through Immersive Telepresence

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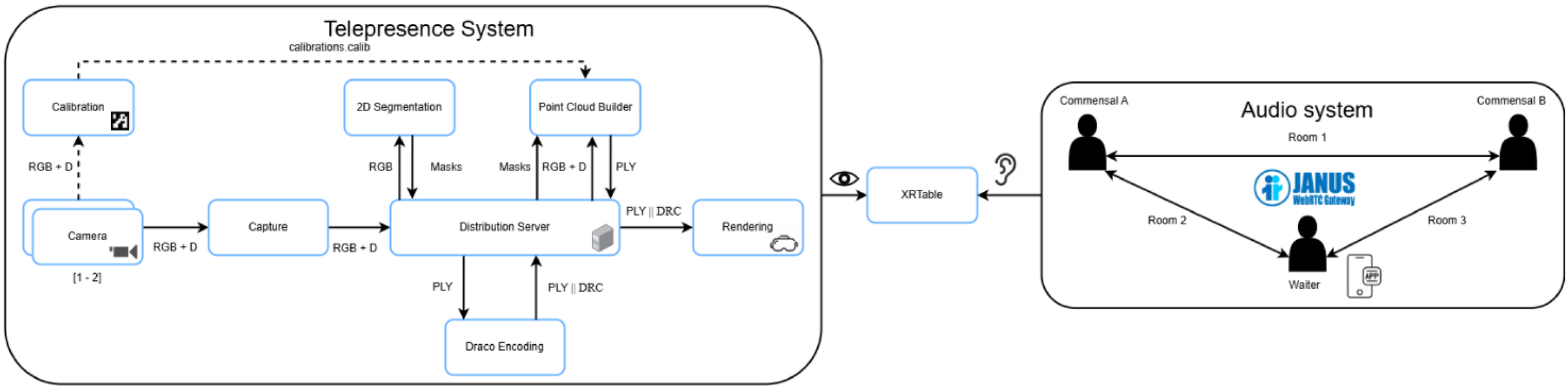

Fig.1: Architecture of the System

Activities

The BAZKARIA project aims to create an immersive and augmented experience that bridges the barriers of remoteness. We conducted the following activities:

1. Co-design engaging domain experts from commensality and technological experts.
2. Implementation of an infrastructure that delivers to each remote commensal immersion and copresence using volumetric video.
3. Evaluation of the experience and the system architecture

Experience Design

The outcomes of the co-design sessions generated a set of design criteria:

1. Provide coherence in the experience.
2. Provide direct communication between the commensals.
3. Provide context to the shared experience.
4. Augment or substitute interactions.

References (Selection)

Santos-Torres, A., et al. (2025, July). The XR Table: Envisioning The Future of Remote Dining Experiences Using Immersive Telepresence. In Proceedings of the 2025 ACM Designing Interactive Systems Conference (pp. 1674-1690).

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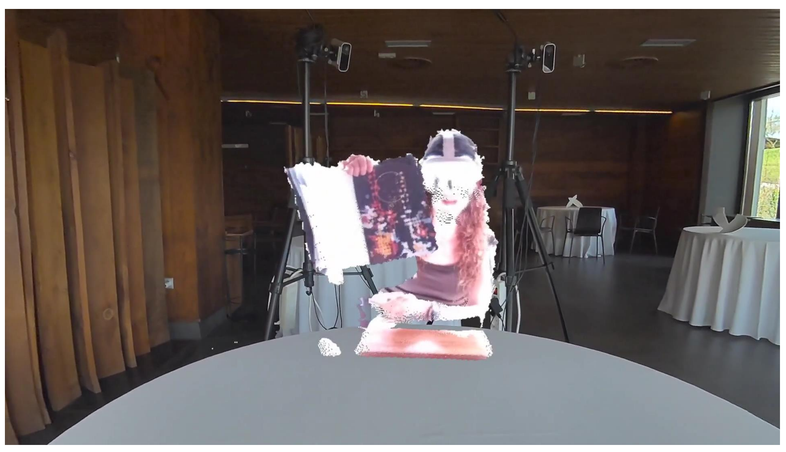

Fig.2: First-Person view during the commensality experience (Santos-Torres, 2025)

System Architecture and Prototype

The implemented prototype has the following components:

1. **Calibration:** To build a 3D point cloud coherently, the images from the multiple cameras need to be aligned through calibration.
2. **Capturing:** This stage is responsible for obtaining frames from the cameras. In the implemented system, the interface utilises Microsoft Azure Kinect SDK cameras.
3. **2D Segmentation:** To be able to distinguish and track objects in the scene, 2D segmentation is applied.
4. **Point Cloud Builder:** This component generates point clouds and returns them to the Distribution Server in a segmented file format.
5. **Plain audio channel for communication:** the system incorporates a Janus WebRTC Service to provide verbal communication to the commensals.

Evaluation

- **User experience evaluation:** we conducted semi-structured interviews and gather quantitative and qualitative data to understand the user experience with our system.
- **The technical evaluation and development** primarily focused on designing a segmentation system capable of detecting and handling various object types based on specific user scenarios.

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