SPIRIT

Demonstrating Immersive Teleoperation of a Robot via Adaptive Point Cloud Streaming

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Why DIANE ?

- **Teleoperation** of mobile robots requires immersivity and spatial awareness
- **Volumetric content** can be sent to the users to this purpose
- Point clouds are **heavy** and robots' **computing resources are low**
- Standard codecs are unsuitable due to latency requirements violation

How DIANE works

- We perform a **bandwidth and distance aware** point cloud **filtering** onboard of the robot
- The retained points are quantized and streamed through **WebRTC** to a head mounted display (HMD)
- The HMD renders the scene and sends **control inputs** to the robot in a **stand-alone** setup
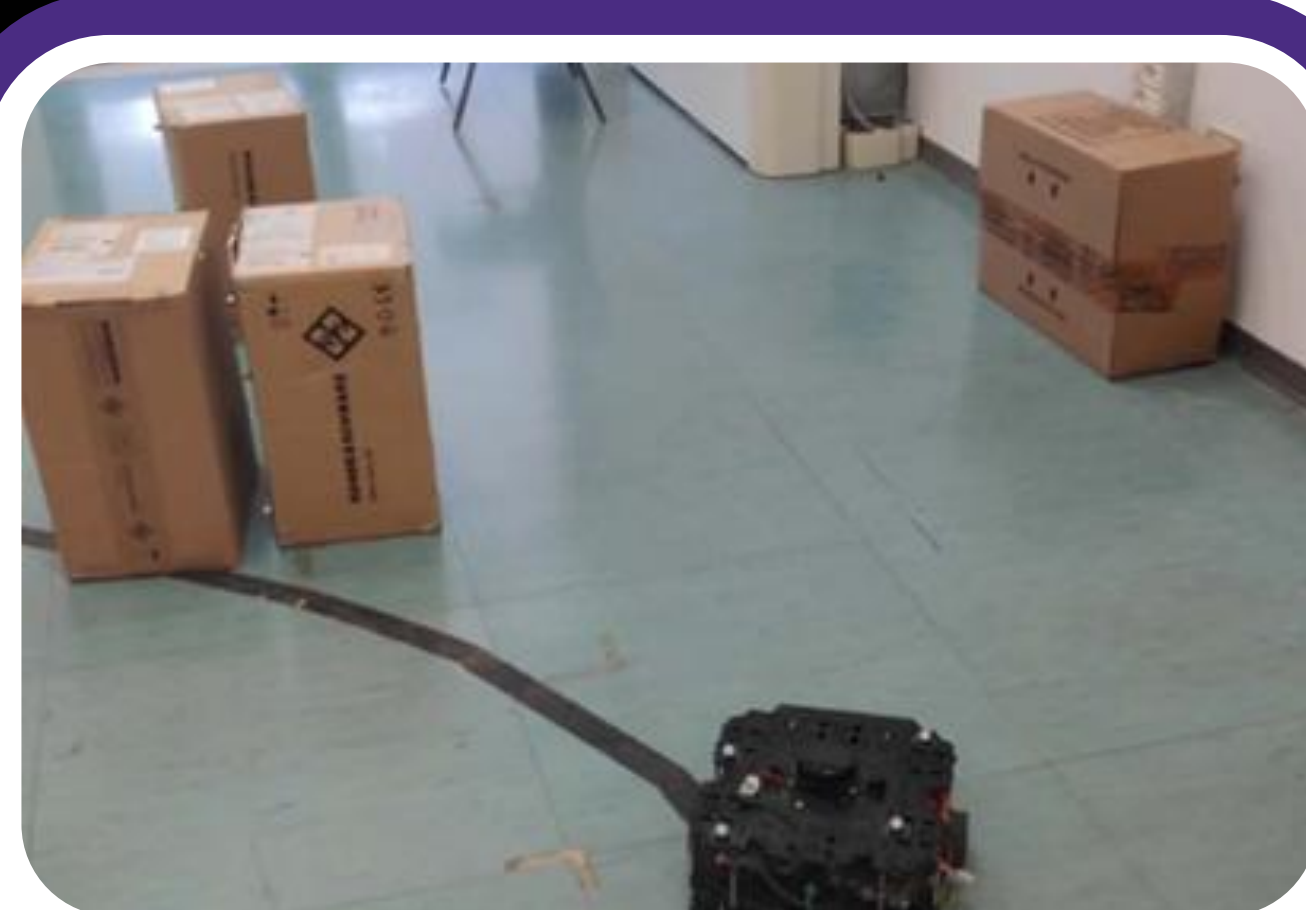
The overall immersive teleoperation framework
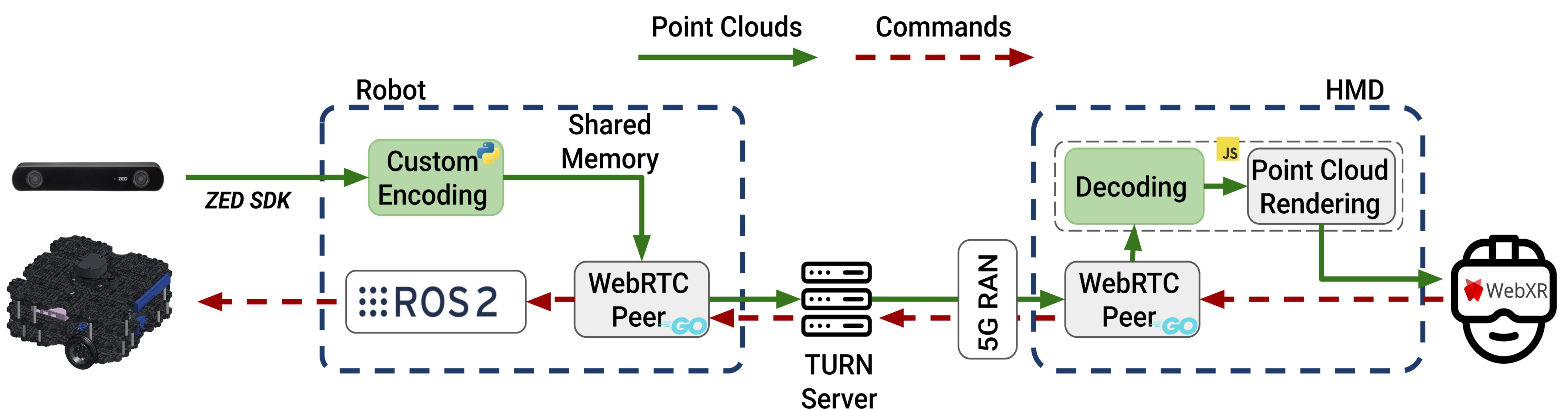
Demo execution

HMD PoV

Operation View

1) **Turtlebot autonomous navigation:** The robot navigates while the user monitors operations.
2) **Robot switching:** Seamlessly switch between multiple robots available.
3) **User Teleoperation:** take control of the robot through the headset
4) **Parameter tuning:** fine-tune the λ and D values to assess the user experience.

Scan for code!

Scan for paper!

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