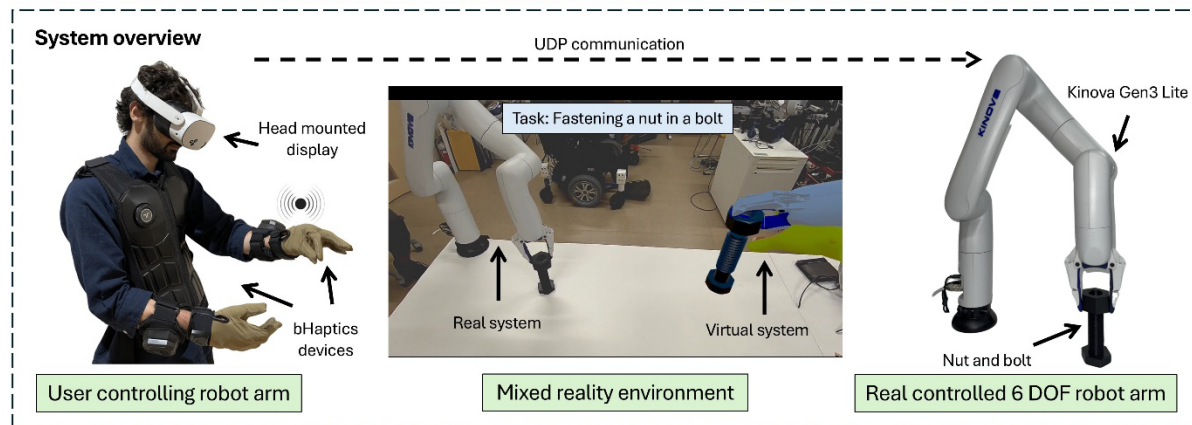


## HaptLinX: Mixed Reality Framework for Precision Tasks Training Utilizing Vibrotactile Haptic Devices

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Mixed Reality training platform designed to accelerate skill acquisition in robotic telemanipulation



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IEEE  
World Haptics  
Conference 2025

**Summary:** We present **HaptLinX**, a haptic-enabled mixed reality (MR) training platform designed to accelerate skill acquisition in robotic telemanipulation. The system integrates a head-mounted MR display and a wearable vibrotactile device, enabling users to perceive object-tool interactions while operating a virtual six-DoF robot. By simulating precision tasks such as remote bolt fastening, the platform delivers real-time haptic cues for alignment, grip force, and errors. User experiments compare performance with and without haptic feedback, demonstrating improvements in task accuracy, situational awareness, and confidence. HaptLinX offers an immersive, scalable solution for training in high-stakes teleoperation scenarios.