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Title: Tele-Presence Infrastructure – Robots and Agents

Abstract:

This RID proposes a tele-presence infrastructure. It would enable remote and onsite workers to physically collaborate with semi- and fully-autonomous robots. Tele-presence is realized by embodying a user with wearable computing like headsets and data gloves to operate a robot agent. This allows the user to transport their presence to fully interact with people and engage their environment from afar, in real-time. This is important and potentially transformative. Users, especially experts, can participate in dull, dirty and dangerous tasks like inspection, repairs, and exploration, without geographic constraints. This RID leverages state-of-the-art research in virtual- and augmented-reality (VR/AR) tele-robotics and presents the PI's preliminary results. Such groundwork points to a promising "best bet" approach. The proposed tasks detail plans to transform tele-operation to realize tele-presence by incorporating haptics into the VR/AR user interface. The RID aligns with NASA, national agencies, industry, and Nevada interests; urgent and important are infrastructure repair, healthcare, and agriculture. Use case scenarios such as construction, tele-rehabilitation, and crop care either in deep space or in Nevada's remote and rural areas serve as both inspiration and research value propositions. The net effect is a RID that yields long-term, self-sustaining, and nationally competitive research.