ForceBot: A Robotic Platform for Body-Scale Human Physical Interaction in Embodied Virtual Reality

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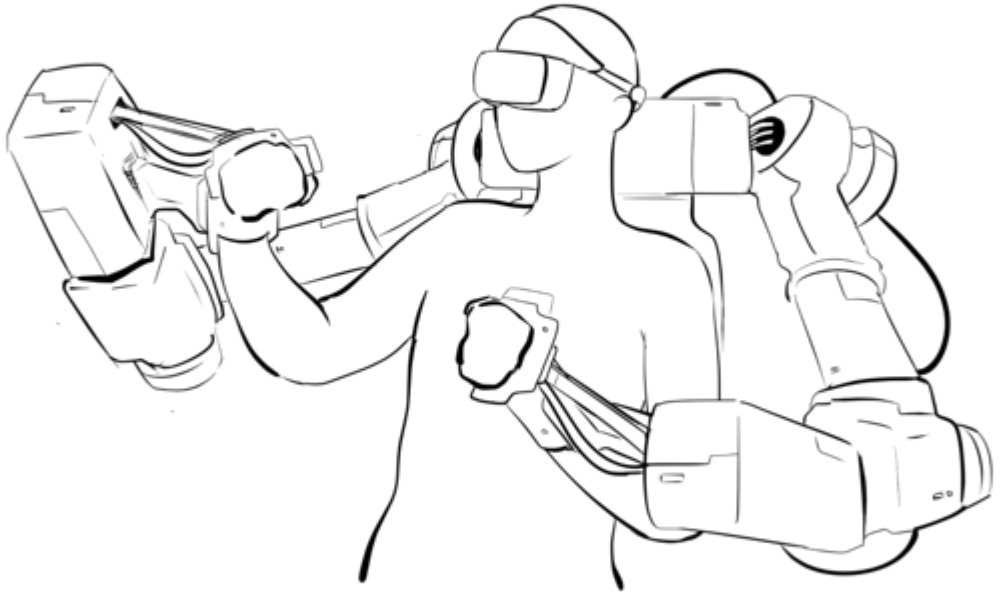

Students Involved

Virginia Tech: ***An-Chi He, Melanie Hook, Connor Herron, Jungsoo Park, Sam Schoedel, Nick Tremaroli***
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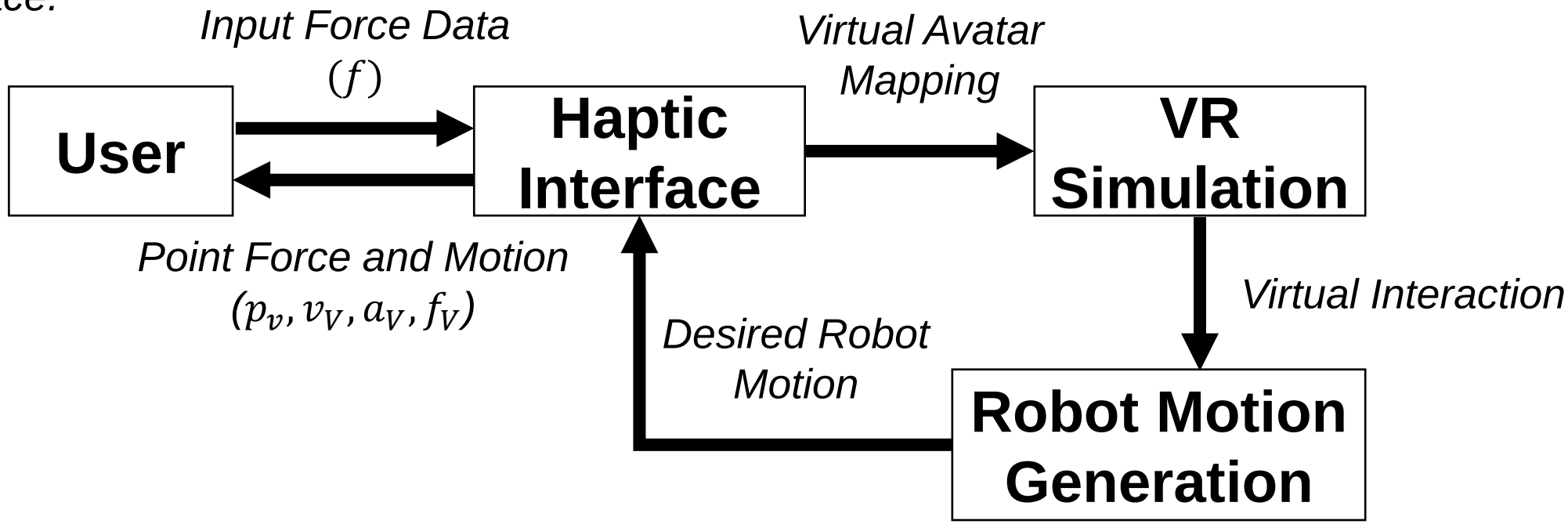
ForceBot Overview

ForceBot *aims to be a dynamic scenario generator that provides body-scale* ***high-fidelity force and position feedback*** *for interacting with* ***realistic simulated environment*** *in the virtual reality (**VR**) space.*



- **Haptic Interface Transparency** to create an immersive and transparent user experience with high dexterity robotic sub-systems.
- **Multiple Robotic Sub-systems Integration with VR** to guarantee simultaneous manipulation for realistic interaction.
- **Ergonomic Human-Machine Interface Design** to align restricted robot workspace and safety measurement.

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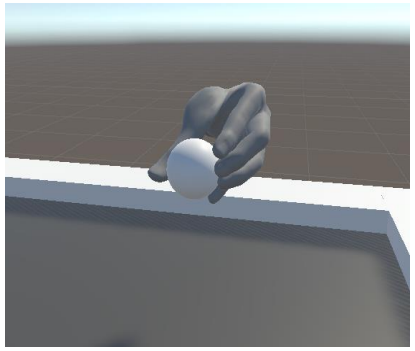
ForceBot Progress

Key Innovations

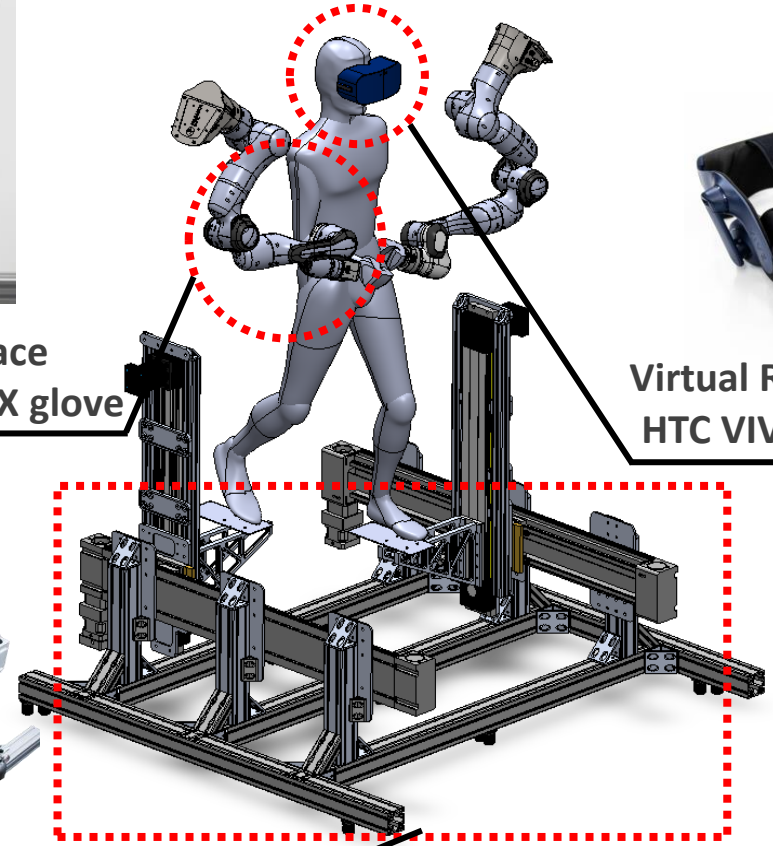
- Virtual Interaction Rendered Realistic Force Feedback.
- VR Integrated Cross-platform Low-latency Communication Field.
- Whole-Body Workspace Mapping into VR Avatar.

New Contributions

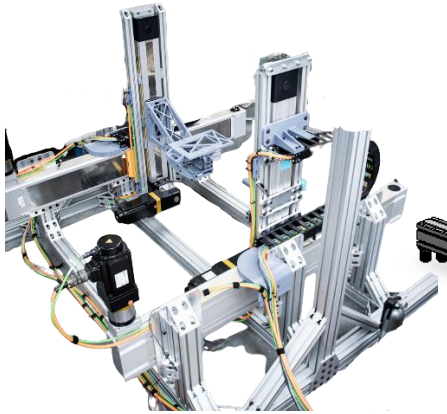
- High Fidelity Whole-Body Sensory Feedback.
- Transparent and Immersive VR Experience.
- Safe and Unrestricted Human-Robot Workspace.



Upper-limb haptic interface
Panda robotic arm with HaptX glove



Virtual Reality Goggle
HTC VIVE VR Helmet



Gait simulator
Two planar gantry system

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Thank You!

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