# HOLOSUITE

## AN EXPLORATION INTO INTERACTIVE **HOLOGRAPHIC** TELEPRESENCE

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## INTERACTION

Holosuite is an end-to-end 3D telepresence software program that seamlessly merges two distant 3D worlds. Users can **collaborate** and co-visualize 3D information while seeing each other's presence in a rendered 3D video-conferencing setting.

Interaction is done naturally using hands to share and manipulate virtual 3D objects.
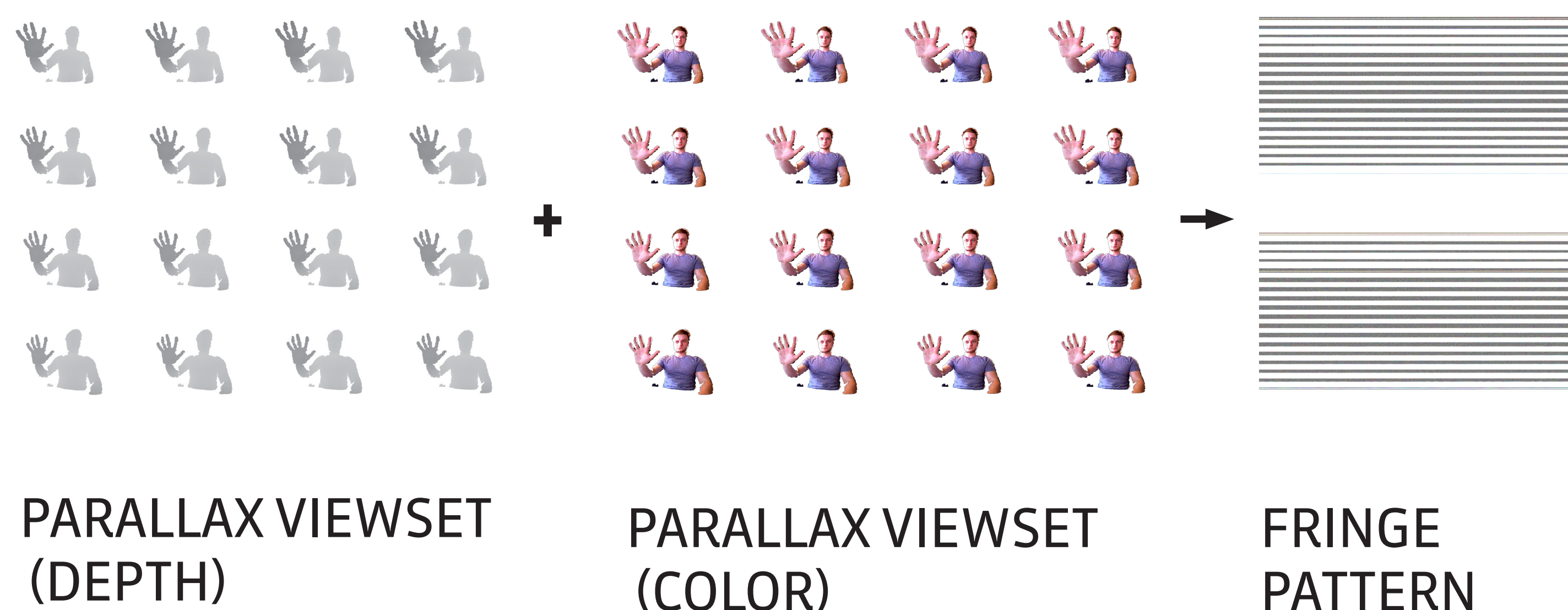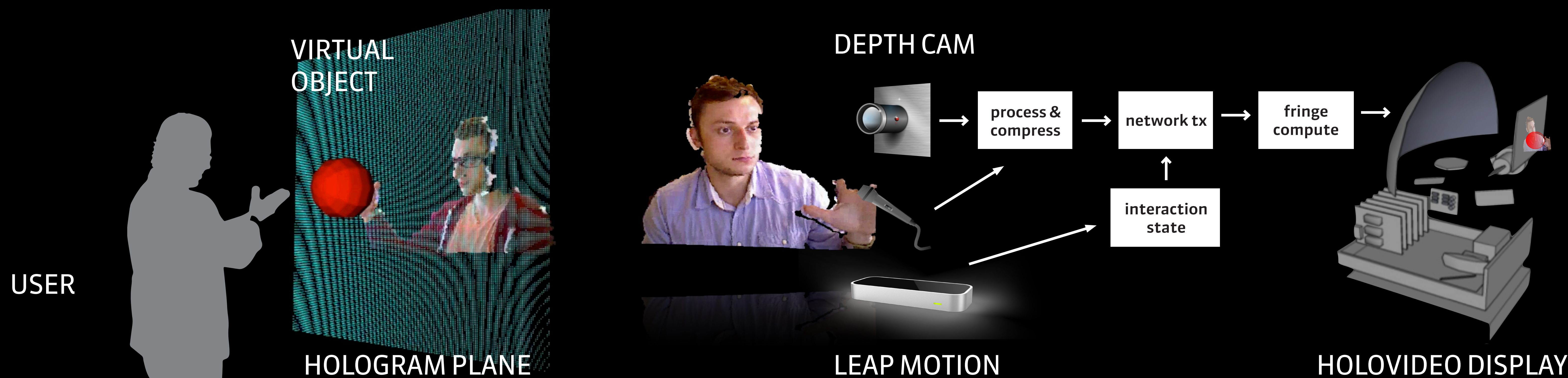
## SIMULATION

Simulation is performed on two ZSpace displays, connected via internet, providing stereo and **full-parallax projection** view of the shared enviornment that is immersive and highly realistic. 3D data & voice is compressed for broadband transmission rates (7-10Mb/s) at high framerates (30fps).

Users can see each other in 3D, and visualize a shared 3D model for usages such as CAD, education and gameplay.

## RENDERING

Holographic rendering is done via CGH using diffraction-specific coherent panoramagram in full color on **MIT/BYU Mark IV AOM-based HPO holographic display**.

A parallax viewset is generated from the scene, including the remote user and 3D model. Fringe pattern is computed from OpenGL scene using CUDA in realtime (22fps, K6000 GPU).



USER — VIRTUAL OBJECT — HOLOGRAM PLANE — DEPTH CAM — process & compress — network tx — fringe compute — interaction state — LEAP MOTION — HOLOVIDEO DISPLAY



PARALLAX VIEWSET (DEPTH) + PARALLAX VIEWSET (COLOR) → FRINGE PATTERN

## ACKNOWLEDGEMENTS & REFERENCES

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**2** S. Jolly, E. Dreshaj, V. M. Bove Jr., "Computation of Fresnel holograms and diffraction-specific coherent panoramagrams for full-color holographic displays based on anisotropic leaky-mode modulators" Proc. SPIE 9006, Practical Holography XXIX: Digital Holography II, 9386-12 (2015).
**3** S. Jolly, D. E. Smalley, J. Barabas and V. M. Bove Jr., "Computational architecture for full-color holographic displays based on anisotropic leaky-mode modulators" Proc. SPIE 9006, Practical Holography XXVIII: Materials and Applications, 90060W (2014).

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