Augmented Reality Visualization of EMPIRE Simulations for Transmedia Learning[1] ELAINE M RAYBOURN, KEITH L CARTWRIGHT, BRAD CARVEY, DANIEL GOMEZ, CHRIS MOORE, NICK ROBERDS, TIM POINTON, PEGGY CHRISTENSON, Sandia National Laboratories — We demonstrate how guiding principles from transmedia learning information visualization, and cross-reality were used to develop augmented reality (AR) visualizations of high-fidelity simulations of photoelectrically generated cavity plasma experiments. The simulation results are generated using EMPIRE, an electromagnetic plasma physics application being developed for exascale simulation on next-generation hardware architectures. Our effort focused on the use of augmented reality (AR) to facilitate a deeper understanding of scientific phenomena via transmedia learning, a scalable system of messages that represents a core experience that unfolds from the use of multiple media. we used AR to superimpose digital assets onto the real-world environment to facilitate understanding of complex information. We outline how we developed an iOS and Android augmented reality application from high-fidelity EMPIRE simulation results by using commercial technology such as Houdini, Unity game engine, Adobe Premiere, and the Wikitude SDK. Participants will take away a deeper understanding of the role of visualization in high performance computing from the perspectives of learning, productivity, and communication through our examples from simulations of x-ray driven cavity plasma experiments conducted on the Z Machine and at the National Ignition Facility (NIF).

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