

## ACS 2023 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

### Promoting Technology and Collaboration

#### The Use of Extended Reality Technologies to Enhance Engineering Medicine (EnMED) Training and Education

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**Background:** EnMed is an innovative engineering medical school created by Texas A&M University (TAMU) and Houston Methodist Hospital (HMH) to be physicians and engineering based medical problem solvers, or “physicianeers.” Students receive a Medical Doctorate and Master of Engineering in a fully integrated four-year curriculum. Given the unique nature of this course, there is an emphasis placed on exploring cutting-edge education technology platforms to accelerate training. Extended reality (XR) platforms such as virtual reality, augmented reality, and mixed reality are gaining prominence as the next generation of Web3 enablers. Here, we explore the effectiveness of a variety of XR platforms in enhancing the EnMed education.

**Technology Overview:** We evaluated a variety of XR platforms on a cohort (n = 25) of EnMed students. These technologies include, but are not limited to: Varjo XR-3, Microsoft HoloLens, Meta Quest 2, FundamentalVR surgical simulation suite (HapticVR) and their CollaborationVR platform, Touch of Life Technologies VH Dissector platform, and the Elucis platform developed by Realize Medical.

**Potential Application in Surgical Simulation and Education:** The above XR platforms will be evaluated as an integrated component to each of the 3 phases of EnMed students’ curriculums. (1) In pre-clerkship, the Touch of Life Technologies VH Dissector platform will supplement *Medical Gross Anatomy* coursework, aiding students in contextualizing anatomical structures in 3-D spaces. (2) FundamentalVR’s surgical simulation suite with HapticVR will better prepare clerkship students on surgery rotations, allowing them to develop advanced understanding of orthopedic, endovascular, and robotic surgery cases in cases. (3) The Elucis platform by Realize Medical will allow EnMed students to build 3-D medical models in 3-D to characterize novel technologies developed in students’ Innovation Immersion Experiences (IIE) — EnMed students’ engineering corollary to traditional clinical rotations.

**Potential Opportunities to Collaborate:** We are open and willing to engage other medical school programs and student cohorts to assist in validating the results of our XR program.