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3D+time flow visualization in virtual reality[1] MELISSA GREEN, ZACKARY BOONE, Syracuse University — By viewing fluid dynamic isosurfaces in virtual reality (VR), issues associated with the rendering of three-dimensional objects on a two-dimensional screen can be addressed. In addition, viewing a variety of unsteady 3D data sets in VR opens up novel opportunities for education and community outreach. In this work, the vortex wake of a bio-inspired pitching panel is visualized using a three-dimensional structural model of Q-criterion isosurfaces rendered in virtual reality using the HTC Vive. Utilizing the Unity cross-platform gaming engine, a program can be developed to allow the user to "scroll" forward and backward in time to analyze the formation and shedding of vortices in the wake. The user can also toggle between different quantities, while keeping the time step constant, to analyze flow parameter relationships at specific times during flow development. In the current status of the game, all of the isosurfaces are rendered as objects to import, and all the relevant isosurface objects do need to be generated externally. There exists a great potential, however, to create a dynamic platform for an interactive and immersive research and education experience using off the shelf gaming systems. As part of this talk, we hope to provide a live demonstration with an HTC Vive.

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