Visualizing Non-Linear Dynamical Systems in Virtual Reality (VR) BRYAN HOLLINGSWORTH, WESTON KIMBRO, CHRIS CURRY, Southwestern University — To understand non-linear dynamical systems, we commonly use mapped out values to predict the behavior of the system. In the case of Virtual Reality, we can visualize beyond two-dimensional mappings which allows us to view complete three-dimensional systems or take three-dimensional Poincaré sections of higher dimension systems. We used a game engine, Unreal Engine 4, to model these systems and to help offload many calculations to our Graphics Processing Unit (GPU) without changes to the code. We now have a program that can model basic examples of non-linear dynamical systems and we continue to work toward modelling more complicated systems through this program. Once we can model any system, this program will be a useful tool in learning non-linear dynamics and we may find behaviors of various systems that we did not see before.

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