

# Real-time Procedural VFX Characters in Unity's real-time short film "The Heretic"

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"The Heretic", the latest real-time short film by Unity's Demo Team features two entirely vfx-based characters, Boston and Morgan. VFX-based characters are notoriously hard to conceptualize, especially in motion. Building and using real-time tools allowed us to explore the space of possibilities and quickly arrive at designs we were satisfied with. The character of Boston is made up of steel wires navigating the environment, conforming to the shape of a bird-like creature. Animating thousands of wires in a traditional way was unthinkable. The challenge then lied in building tools allowing to express the intention of the artists, allow for emergent behavior, but also make it directable at the same time. Boston is implemented as a set of tools, scripts, and shaders within the Unity engine. The character Morgan doesn't have a clearly- defined physical manifestation, morphs between its female and male forms, and constantly varies its size. Morgan is implemented using the Unity Visual Effect Graph, extended with additional tools and features. The presentation will be of value to all creative communities that base their process on real-time technology - both within game development and real-time filmmaking. From a film production perspective, such characters are typically entirely within the domain of expertise of post-production / VFX studios. With the introduction of realtime-based VFX characters, these characters can be included much earlier in the production process and are more open for experimentation and better connected to the rest of the production elements. From a game development perspective, real- time VFX-based characters allow for bolder and more unconventional creative ideas to be conceived and executed and thereby contribute to richer and more elaborate virtual worlds. They allow the creatives to express more complex, abstract or surreal ideas and develop interesting and original aesthetics.