

Virtual Human Toolkit

2006-present

The ICT Virtual Human Toolkit is a collection of modules, tools, and libraries designed to aid and support researchers and developers with the creation of virtual human conversational characters. The Toolkit is an on-going, ever-changing, innovative system fueled by basic research performed at the University of Southern California (USC) Institute for Creative Technologies (ICT) and its partners.

Designed for easy mixing and matching with a research project's proprietary or 3rd-party software, the Toolkit provides a widely accepted platform on which new technologies can be built. The goal is to make creating virtual humans easier and more accessible, and thus expand the realm of virtual human research and applications.

The ICT Virtual Human Toolkit is built upon a common modular architecture which enables users to utilize all modules as is, one or more modules coupled with proprietary components, or one or more modules in other existing systems.

Our technology emphasizes natural language interaction, nonverbal behavior, and perception and is broken up into the following main modules:

- AcquireSpeech: A tool to send audio, or text, to speech recognizers and to relay the information to the entire system.
- MultiSense: A perception framework that enables multiple sensing and understanding modules to inter-operate simultaneously.
- Non-Player Character Editor (NPCEditor): A suite of tools which work together to create appropriate dialogue responses to users' inputs.
- Nonverbal Behavior Generator (NVBG): A rule-based behavior planner that infers communicative functions from the surface text and selects appropriate behaviors that augment and complement the characters' dialogue.
- Rapport 1.0: An agent that provides nonverbal feedback based on human nonverbal and verbal input.
- SmartBody (SB): A modular, controller-based character animation system that uses the Behavior Markup Language.
- vhtoolkitUnity: A renderer with custom authoring and debug tools based upon the Unity game engine.

For more information visit: <https://vhtoolkit.ict.usc.edu/>



At the University of Southern California Institute for Creative Technologies leaders in artificial intelligence, graphics, virtual reality and narrative advance low-cost immersive techniques and technologies to solve problems facing service members, students and society.