

Virtual Human Museum Guides: Ada and Grace

Bringing Science and Technology to Life

Meet [Ada and Grace](#), two bright and bubbly educators who arrived at the [Museum of Science, Boston](#) in 2009. Science and technology are literally part of their being. That is because they aren't real people - but virtual ones. Designed to advance the public's awareness of, and engagement in, computer science and emerging learning technologies, the virtual guides make a museum visit richer by answering visitor questions, suggesting exhibits and explaining the technology that makes them work. Visitors can even participate in the research that will make them better.



Named for Ada Lovelace and Grace Hopper, two inspirational female computer science pioneers, these digital docents are trailblazers in their own right. As part of an exhibit called "InterFaces" they are among the first and most advanced virtual humans ever created to speak face-to-face with museum visitors. As both examples and explainers of technical scientific concepts, they represent a new and potentially transformative medium for engaging the public in science.

A collaboration between University of Southern California's Institute for Creative Technologies and the Museum of Science, Boston, this project highlights the educational and research potential of virtual characters by getting them out of the lab and interacting with people in meaningful and memorable ways.

Combining computer-generated character animation with artificial intelligence and autonomous agent research, the life-sized virtual human museum guides speak directly with visitors. Not only are they capable of discussing the science content of a museum exhibit, they also can be funny and model a convincing range of human emotions, providing an unprecedented opportunity to inspire youth and learners of all ages about computer science and related STEM fields.

Because virtual humans are based upon cutting-edge technology in artificial intelligence, and graphics, they are themselves an intriguing display of advanced STEM technology. At the museum, they don't just serve as guides but as a technology exhibit too. In a "Science Behind Virtual Humans" exhibit dynamic displays placed next to the characters further educate visitors by showing the underlying processing the virtual humans perform in areas such as automatic speech recognition and natural language processing that allow the 19-year-old twins to move, listen, and talk just like real young adults.

At the Museum of Science, visitors not only observe science, they also participate in the process of science: In a "Living Laboratory" element of the project, data acquired from visitor interactions with the virtual humans is being used on an ongoing basis to improve the performance of the virtual humans. Results will be displayed to visitors so they can better understand the iterative research, design and development process of advanced software systems. By interacting with the many thousands of people that visit the museum annually, a database will be acquired that can help advance the state of the art in virtual human technology. In turn, such a rich database can have benefits for other virtual human applications in areas such as training, education, medical interventions, and entertainment. In addition, by moving a research project into a museum, the Virtual Museum Guides project transforms museums from a place where science is merely displayed to a place where science is actually done.

Facts and Figures

- + Opened December 2009 at the Museum of Science, Boston.
- + An estimated 160,000 museum visitors have interacted with Ada and Grace.

Goals

- + Inspire youth and learners of all ages about computer science and related STEM fields.
- + Extend the capabilities of ICT virtual humans and build on work in intelligent coaching.
- + Advance the field of informal science by introducing an engaging, responsive and reinforcing social interface into informal science that will help turn passive visitors into active participants.

Related ICT Projects

- + [Coach Mike](#), another virtual human museum guide at the Museum of Science, Boston.

USC Institute for Creative Technologies

12015 Waterfront Drive // Playa Vista, CA 90094-2536

ict.usc.edu // 310.574.5700 tel // 310.574.5725 fax // info@ict.usc.edu

facebook.com/USCICT // Twitter: @USC ICT // youtube.com/USCICT // ict.usc.edu/blog

