The Uncanny Valley of Eeriness

Panelists

Thierry Chaminade
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Jessica K. Hodgins
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Joe Letteri
Weta Digital

Karl F. MacDorman
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In 1970, an eminent Japanese roboticist, Masahiro Mori, proposed the "uncanny valley" curve to describe the emotional response of humans to nonhuman agents. At the core of his proposal is the idea that as an agent is made more humanlike, the observer's familiarity does not linearly increase as one would intuit, but falls into a "valley of eeriness," when the agent closely yet imperfectly impersonates a human being. Although Mori used the uncanny valley to describe robots, the hypothesis has been revived to describe emotional responses to computer-animated agents in movies and videogames.

With computer hardware and software allowing increasingly elaborate rendering of forms and motion, the uncanny valley is becoming a high-stakes concern of the entertainment industry: Is it an insurmountable boundary that one should avoid at all costs, or an outdated idea stemming from the technical limitations of more than 35 years ago? This panel presents different perspectives on the uncanny valley by combining an industrial perspective on the issues at stake (Joe Letteri), neuro-scientific investigations (Thierry Chaminade), and the views of developers of android robots (Karl MacDorman) and computer-animated avatars (Jessica Hodgins).

Biographies

Thierry Chaminade received his Ph.D. in neuropsychology at the University Louis Lumières Lyon 2, France in 2003. His thesis work investigated the neurophysiology of action observation and imitation using human neuroimaging techniques performed in the INSERM Unit 280, Lyon, France and the University of Washington's Institute for Mind, Brain and Learning, Seattle, USA. In 2004, he was a visiting researcher at the Advanced Telecommunications Research Institute, Kyoto, Japan, where he started investigating social interactions with artificial agents. He is now a post-doctoral fellow at the Functional Imaging Laboratory at University College London, UK continuing his research in the domains of the understanding of the behavioral and neuronal bases of interactions with real and artificial agents.

Jessica Hodgins is a Professor in the Robotics Institute and Computer Science Department at Carnegie Mellon University. Prior to moving to CMU in 2000, she was an an Associate Professor and Assistant Dean in the College of Computing at Georgia Institute of Technology. She received her Ph.D. in Computer Science from Carnegie Mellon University in 1989. Her research focuses on computer graphics, animation, and robotics. She has received a NSF Young Investigator Award, a Packard Fellowship, and a Sloan Fellowship. She was editor-in-chief of ACM Transactions on Graphics from 2000-2002 and SIGGRAPH Papers Chair in 2003. Her research focuses on animation of human characters and control of humanoid robots.

Joe Letteri has pioneered and developed many of the digital techniques that have become the standard in bringing photographic quality to high-end visual effects. As an artist, he has specialized in the creation of highly realistic imagery, from the dinosaurs of Jurassic Park and Gollum in The Lord of the Rings, to the 25ft gorilla Kong in King Kong. Joe is the winner of two Academy Awards® for the visual effects of The Lord of the Rings: The Two Towers in 2002, and The Lord of the Rings: The Return of the King in 2003. He is also the recipient of the Academy's Technical Achievement Award for co-developing the subsurface scattering technique that was used to bring Gollum to life. Joe joined Weta Digital Ltd in 2001 as visual effects supervisor on the The Lord of the Rings: The Two Towers, a role he kept for The Return of the King and King Kong. Previously, he had been at Industrial Light & Magic since 1991, and became a visual effects supervisor on Mission: Impossible in 1995.

Karl F. MacDorman is Associate Professor at the Indiana University School of Informatics and Adjunct Professor at the Purdue University School of Science and Technology. Previously, he was Assistant Professor (1997-2000) and Associate Professor (2003-2005) at Osaka University, where he worked on android robot development with Hiroshi Ishiguro. MacDorman received a BA in computer science from the University of California, Berkeley, and a PhD in machine learning and robotics from Cambridge University. His research interests include human-robot interaction, machine learning, and cognitive science, and he has more than 60 peer-reviewed publications in these areas.