

The MOVES Institute—From Science Fiction Novels to Your Door

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Abstract

The MOVES Institute's mission is research, application and education in the grand challenges of modeling, virtual environments and simulation (MOVES). The institute's focus is on 3D visual simulation, networked virtual environments, computer-generated autonomy, human performance engineering, immersive technologies, defense/entertainment collaboration, and evolving operational modeling.

The research that we are performing increasingly looks like the technological vision of science fiction novels. In networked virtual environments, we are architecting the technology that allows us to build large-scale, dynamically extensible virtual environments, virtual environments that are semantically interoperable and always on. In computer-generated autonomy, we are building story engines that allow us to traverse infinite collections of story elements in controlled fashion, producing an immersive experience for the user. With a scenario engine, we are determining the space of potential outcomes from a virtual description of an infrastructure, a set of policies, character and cultural behaviors. In immersive technologies, we have designed a source-less tracker that is micromachinable, and have performed considerable work on the deployment of sound to enhance the feeling of immersion. In defense/entertainment collaboration, we have constructed a suite of PC games that provide the experience of a potential career in the Army and researched the ability for computing player aptitude from game play.

We have fielded the largest played networked PC game in history from inside of our institute, a game that has been the recipient of several "best game" or "runner up for best game" of the year awards. We have recorded sounds with Lucas Skywalker Sound's THX division that are used in human performance engineering's LCAC simulators and in Spielberg's movie, *Minority Report*.

In this talk, we discuss the history of the development of our institute, our unique educational program, our research vision, specific projects within that vision and their relationship to the popular science fiction genre.

Michael Zyda is Director of the MOVES Institute at the Naval Postgraduate School, Monterey. He is also a Professor in the Department of Computer Science at NPS. Since 1986, he has been the Director of the NPSNET Research Group. He has been at NPS since February of 1984. Professor Zyda's research interests include computer graphics, large-scale, networked 3D virtual environments, agent-based simulation, modeling human and organizational behavior, interactive computer-generated story, computer-generated characters, video production, entertainment/defense collaboration, and modeling and simulation. He is the principal investigator of the America's Army PC game funded by the Assistant Secretary of the Army for Manpower and Reserve Affairs.

Professor Zyda was a member of the National Research Council's Committee on "Virtual Reality Research and Development" and is one of the key authors of that report. Professor Zyda was the chair of the National Research Council's Computer Science and Telecommunications Board Committee on "Modeling and Simulation: Linking Entertainment & Defense". From that report, for the Deputy Assistant Secretary of the Army for Research and Technology, Professor Zyda drafted the operating plan and research agenda for the USC Institute for Creative Technologies (ICT).

Professor Zyda was a member of the National Research Council Committee on Advanced Engineering Environments. Professor Zyda is chair of the National Research Council Aeronautics and Space Engineering Board Panel on Computing, Information, and Communications Technology (CICT) and member of the parent NRC Committee for the Review of NASA's Pioneering Revolutionary Technology Program. Professor Zyda is also a Senior Editor for Virtual Environments for the MIT Press quarterly PRESENCE, the journal of teleoperation and virtual environments. Professor Zyda is also a member of the Technical Advisory Board of the Fraunhofer Center for Research in Computer Graphics, Providence, Rhode Island. He is a Member of the Board of Advisors for the Georgia Institute of Technology Modeling and Simulation Research and Education Center.

Professor Zyda has consulted for the White House Office of Science and Technology Policy, the Ministry of Industrial Development Sabah Province, Malaysia, Japan Tech Services Corporation, Tokyo, Hitachi Plant Construction & Engineering, Ohtsuka, SimGraphics Engineering, Pasadena, Silicon Graphics International, Geneva, Nihon Silicon Graphics KK, Advanced Telecommunications Inc., TecMagik, SpiritChannel.com, Muse3d.com, and Paramount Digital Entertainment, among others. He is a speaker with Celebrity Speakers, International.

Professor Zyda began his career in Computer Graphics in 1973 as part of an undergraduate research group, the Senses Bureau, at the University of California, San Diego. Professor Zyda received a BA in Bioengineering from the University of California, San Diego in La Jolla in 1976, an MS in Computer Science/Neurocybernetics from the University of Massachusetts, Amherst in 1978 and a DSc in Computer Science from Washington University, St. Louis, Missouri in 1984.