Initiatives and Technologies

A New Format for Bringing 3-D Content to the Web

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Overview

3-D content is vital to pursuits ranging from CAD visualization to medical imaging, geographic information systems to consumer product catalogs and high-end gaming. Yet the lack of a simple, consistent, and widely accepted format has kept this valuable content essentially absent from the Web and internal Web-based systems. Intel is working to change that, through an initiative that will define, develop, and deliver a common 3-D format to hardware and software designers, Internet developers, tool makers, and others.

Announced at SIGGRAPH 2002, the initiative is being undertaken by a working group under the auspices of the Web 3-D Consortium, the organization that defined the VRML standard and its XML version, X-3D. Intel is leading the group, which is known as the CAD 3-D Working Group and includes not only CAD vendors and users but also digital-content creators and industry-standards bodies. The group will release its initial version of the format, along with player software, by the end of 2003. Between now and then, group members will evaluate existing 3-D formats, identify new 3-D format and player requirements, define specifications, and assist in their development. Ongoing work will focus on supporting the format and player through deployment and marketing efforts.

Throughout this endeavor, the CAD 3-D Working Group will focus its energies exclusively on delivering an intermediary format to bring CAD visualizations and other 3-D content to the Web and Web-based systems. In keeping with its ambitious delivery schedule, the group is dedicated to avoiding complexity and has no intention of replacing any of the proprietary 3-D CAD formats now in widespread use.

Problem: Lack of uniform standard

The need for a common 3-D format becomes clear in a simple perusal of the Web, where the volume of 3-D content is minuscule—well under one percent. This is largely because the market is fragmented among a number of proprietary 3-D formats. These include AutoDesk, EDS, and Dassault Systemes CATIA (in CAD and industrial design) and Macromedia, Viewpoint, and a host of others (in gaming and other consumer products). These formats

are ideally suited to their respective markets, but they were not originally designed with a strong Web focus.

This is especially true for the CAD formats. Consequently, the 3-D CAD models that have become the centerpiece of design and manufacturing are not as versatile as they could be. Typically, such models remain inside engineering departments and cannot easily be used in marketing or customer service. This is because for most businesses it is not cost-effective to deploy the proprietary CAD software—which is necessary for manipulating the model so it can be used in a secure and practical fashion across or beyond an enterprise—outside of engineering.

For example, consider an automobile company attempting to deploy a 3-D CAD model to its Web site for marketing purposes. Typically, this endeavor would require that a hard copy of the model be scanned into a high-end drawing program where an artist would remove proprietary and confidential design details while making the model more easily understandable to consumers. This process can easily add thousands of dollars or double the cost of deploying even a single 3-D CAD model to the Web.

Goal: More effective collaboration

Through the initiative of the CAD 3-D Working Group, Intel is working to remove such barriers so that 3-D content can be deployed throughout a business—in sales, customer service, and Web-based applications. In keeping with this goal, the proposed format will be highly extensible, not only for the purpose of protecting proprietary information but also to ensure that any major CAD software can write to it.

The extensibility of the proposed 3-D format also will help to make it ideal for a vast assortment of Web-based applications:

- An online catalog—for internal use or a business or consumer audience—can display a vast array of goods and services in a way that suppliers and customers have never seen before.
- Documentation for sophisticated medical equipment can be fully available online instead of requiring shelves full of manuals just to accommodate the highly detailed drawings.
- Distance learning can be enhanced through 3-D simulations.
- Military mechanics who work on an armored personnel carrier, for example, can examine any of the vehicle's 8,000 parts in interactive 3-D or access vital repair and maintenance information on any vessel in the Navy's fleet.

Whatever the application, with a common 3-D format the CAD tool community will enjoy a more effective means of collaboration in design, marketing, and

manufacturing. Moreover, all businesses dealing with 3-D content will enjoy lower costs associated with developing and publishing that content to the Web.

Summary

Intel brings a wealth of experience to the pursuit of a common 3-D format, having worked with 3-D content for nearly a decade. Most recently this work has taken place through Intel's partnership with Macromedia and through its efforts in the development of MPEG and other graphical standards. Through its efforts, and those of the other members of the CAD 3-D Working Group, Intel believes that 3-D content can become as commonplace on the Web of the future as video, audio, and animation are on the Web of today. For these reasons, Intel strongly encourages developers and other interested parties to join the effort by contributing their ideas to the new format or by making plans now to adopt it in future products.

For more information

For more information on the Web 3-D Consortium CAD 3-D Working Group and its progress toward development of a 3-D format standard for the Web, go to http://www.web3d.org or http://www.openhsf.org. To learn more about Intel's work in 3-D, technologies, go to http://www.intel.com/labs/media/3dsoftware/ or call Pam Lusardi at 503-264-8484 or Clint Taylor at 503-264-7574.

Author biography

Omid A. Moghadam has worked as technology manager in the Microprocessor Research Labs at Intel since early 2000. He holds 22 U.S. Patents and additional international patents, is an Eastman Distinguished Inventor, and earned his B.S.E.E. And M.S.E.E. From the State University of New York at Buffalo and M.B.A. From the University of Rochester (Simon). He is a member of IEEE, ACM, and NCITS. For more information on key projects, go to http://www.intel.com/research/mrl/people/moghadam_o.htm.

[Sidebar]

CAD 3-D Working Group: Member Organizations

- 3-D Labs
- Actify
- Adobe
- ATI
- Boeing
- Dassault Systemes
- I3-Dimensions
- Intel

- Lattice
- Mental Images
- Microsoft
- Naval Post Graduate School
- NIST
- Parallel Graphics
- OpenHSF/Tech Soft
- SGDL Systems Inc.