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Automated Generation of Three-Dimensional Virtual Worlds for Task Explanation
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During the second quarter of our contract, we did further work on the software infrastructure needed to support our research, expanding on the testbed for knowledge-based augmented reality that we had begun to build in September 1991. We concentrated on low-level graphics systems programming needed to improve our support for multiple 3D trackers and to increase the functionality of the 3D graphics package we are using with our head-mounted display, two of the areas detailed in our previous report. In addition, we learned that the paper on this research that we had submitted to *Graphics Interface '92* was accepted.

We spoke with Reflection Technology about acquiring their high-resolution (1120×900) prototype virtual display—the developer's version of a descendant of the "Private Eye" that we use in our current see-through HMD. Unfortunately, their early prototype unit is rather bulky since it includes four of the current Private Eye systems, and a set of internal beam splitters that merge their images. The use of the beam splitters in the prototype diminishes the light output to below that of the current product, severely affecting its utility as a see-through display. Therefore, we decided to postpone a purchase decision.

Over the past three months, we gave invited talks that discussed our ONR-supported work at Bell Labs (Murray Hill, NJ, January 17, 1992), NYU Stern School of Business (New York, NY, January 23, 1992), *Virtual Reality: New Directions in Human/Computer Interaction '92* (New York, NY, February 4, 1992), and Matsushita Information Technology Laboratory (Princeton, NJ, February 7, 1992). A *CHI '92* tutorial proposal on knowledge-based graphics (with J. Mackinlay and Joe Marks) was accepted. A previously announced gift to our lab from Hewlett-Packard of an HP 9000 433 TurboVRX T3 was upgraded to become the gift of an HP 9000 730 Turbo VRX T4.
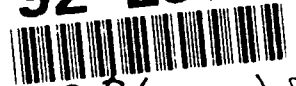
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