

## Real-time 3D Visualization

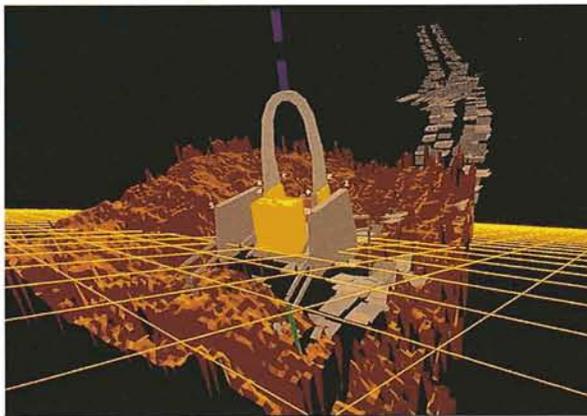


**C**utting edge 3-D virtual reality technology from NASA used to program and direct planetary explorer vehicles can visualize real-time data in three dimensions.

Fourth Planet, Inc. of Santa Clara, California is a visualization company that specializes in the intuitive visual representation of dynamic, real-time data over the Internet and Intranets.

Founded in 1996, Fourth Planet has as its core a team formerly from the Intelligent Mechanisms Group (IMG) at the Ames Research Center. Over a five-year period, the then NASA researchers performed ten robotic field missions in harsh climes—including underwater in Antarctica, the Kilauea volcano, and Alaska's Mount Spurr—each test designed to mimic the end-to-end operations of automated vehicles trekking across another world under control from Earth. The core software technology used for these missions was the Virtual Environment Vehicle Interface (VEVI), developed at Ames.

VEVI was selected as first runner-up in NASA's 1996 Software of the Year Awards. VEVI is a modular



operator interface for direct teleoperation and supervisory control of robotic vehicles. It uses real-time interactive 3D graphics and position/orientation sensors to produce generic vehicle control capabilities. VEVI has been used to control wheeled, legged, air bearing, and underwater vehicles in a variety of environments.

Butler Hine, who was director of the IMG at Ames, and five others partnered to start Fourth Planet. Their calling after leaving NASA is to bring together three important and emerging technologies: Real Time Data, Network Computing, and 3D Graphics and Data Visualization. Fourth Planet contends that the convergence of these technologies will revolutionize the world of computing. It is the mission of the start-up company to drive this revolution with products and services that

put real data, delivered in real time into compelling and useful visual representations.

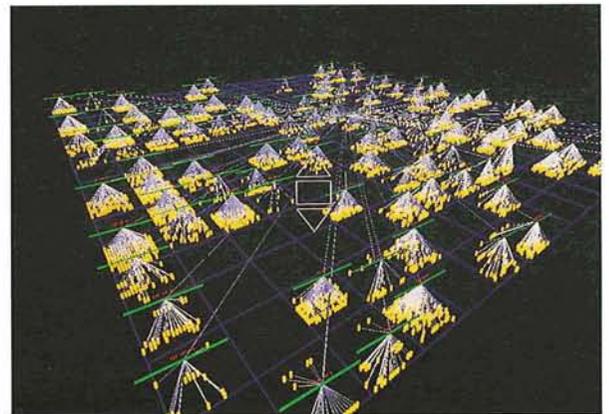
Not straying too far from Ames, Fourth Planet moved into the NASA/Ames Technology Commercialization Center, a business incubator for start-up companies. Situated in the incubator, Fourth Planet pays a reduced rent and shares administrative cost for copiers, faxes and secretarial assistance. Perhaps more importantly, the group is in residence with 29 other businesses within the incubator, a hub of contacts and knowledge.

Fourth Planet has released VEVI4, the fourth generation of the award-winning VEVI Ames software. VEVI4 is a cutting-edge computer graphics visualization and remote control applications tool, available commercially for the first time. VEVI4 can represent complex devices graphically in a 3D environment.

NetVision is another Fourth Planet product. This package can allow large companies to graphically view and analyze in virtual 3D space such things as the health and performance of their computer network, locate a trouble spot on an electric power grid, or evaluate a company's web of computer links.

Other software products and services are forthcoming from Fourth Planet.

The world of visual computing is undergoing a major shift in technology, explains Fourth Planet literature, "because seeing is understanding." Once confined to universities and high-end research labs with big budgets, the technologies of 3D computer graphics and data visualization are rapidly becoming available to the world at large. In addition, the explosion of the Internet has created an efficient and available infrastructure for the delivery of real-time data.



Combining the technologies of 3D graphics and real-time data collection, Fourth Planet's NetVision creates a virtual representation of large scale, complex networks.

*Based on award-winning NASA telerobotics software, VEVI4 is a powerful tool used to represent complex devices graphically in a 3D environment. Depicted here is the Dante II vehicle during its descent into Mount Spurr, Alaska.*