PV-WAVE Helps Penn State Educator Train Petro Engineers of Tomorrow

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Dr. Abraham Grader
Associate Professor, Petroleum Engineering
Pennsylvania State University

QUICK FACTS

Students in the College of Earth and Mineral Sciences at Pennsylvania State University are using PV-WAVE in an advanced reservoir-engineering course. They are studying fluid flow in underground strata and rely heavily on solving diffusion partial differential equations describing various reservoir cases. PV-WAVE allows students to easily understand reservoir phenomena when they are illustrated in three dimensions.

THE PROBLEM

“My students are not intimidated by high-speed computer use in the classroom. They like it. It provides a wonderful platform for bridging the gap between symbolic representations and physical phenomena,” said Dr. Abraham Grader, associate professor of petroleum engineering at Pennsylvania State University in College Station, Pennsylvania.

Dr. Grader works in the mineral engineering department at the College of Earth and Mineral Sciences. He is one of seven faculty members who specialize in reservoir engineering and computer modeling.

“We do a lot of computer and experimental work, as well as teach at the graduate and undergraduate level,” he said.
THE SOLUTION

Dr. Grader is currently using PV-WAVE, a visual data analysis software package developed by Visual Numerics, in an advanced reservoir-engineering course that studies fluid flow in underground strata. His class relies heavily on solving diffusion partial differential equations describing various reservoir cases.

“I am using visualization as a means to describe spatial and temporal piezometric fluid fields, and, together with my students, we do a lot of particle tracking,” he explained. “My goal is to have the same computer environment in the classroom that I have in my office. This way I can prepare curricula on my own computer. I can then enter the classroom, hook up to the network and actually demonstrate lesson plans on a large screen. The students love it,” he said.

Dr. Grader claims that his use of PV-WAVE allows for greater student/teacher interaction. Visual display lets him solicit ideas from his students and simulate and display these in real time. He says it is easier for his students to understand reservoir phenomena when they are illustrated in three dimensions because the events are made “self-explanatory.”

The product is used as an interface for the thousand of CAT (computer-assisted topography) scan images generated for rock characterization and for studies of fluid flow in porous media.

RETURN ON INVESTMENT

“My department is also using PV-WAVE for synthetic imaging, which are images created directly on the computer. I decided to use PV-WAVE with my teaching because it allows me to display 3D surfaces and volume imaging,” Grader said. “It is even helpful to my students, who use PV-WAVE for their classroom homework.”

WORLD CLASS PRODUCTS, SERVICES, AND SUPPORT

For over 30 years, Visual Numerics, with its PV-WAVE and IMSL product families, has provided trusted visualization and numerical analysis tools to thousands of technical professionals in a broad range of industries around the world. Scientists, researchers, educators, engineers, developers, Intranet managers, testers and analysts use Visual Numerics’ development tools to solve problems, identify trends and share results.
The PV-WAVE Family has all of the functionality you need in one tool, including an open software environment allowing for integration with new technologies, and the IMSL Library which delivers over 370 mathematical and statistical routines, creating the most powerful data analysis software available. The IMSL libraries can dramatically accelerate development by reducing programming time by up to 95%.

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