Computer science professor to release comprehensive 3-D deformable object library for free

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On Monday, Aug. 6, USC Professor Jernej Barbič will release the world's most comprehensive library of 3D deformable modeling software for free open source download.

The package, called Vega, allows users to simulate and move complex objects, bending, stretching and twisting them in real time. A potentially powerful tool for animation and game artists, as well as engineers designing complete structures, Vega is optimized for speed and can animate the motion of any 3D solid object, under any user-specified forces. In fact, no other free library offers such a comprehensive range of materials and deformable simulation methods.

The culmination of eight years of development, Vega's license allows anyone in the world to freely use and modify its over 50,000 lines of software code, whether for academic research or commercial applications. Unique in its implementation of popular deformable object methods, the package works out of a standard computer system for representing 3D objects, dividing their interiors into pyramids ('tetrahedrons'). In a matter of seconds, Vega can simulate both geometrically simple objects as well as complex objects made up of hundreds of thousands of tetrahedra.

While portions of Vega have been in use in various forms for years, Barbič has carefully edited and optimized the current package, which he

will consistently update.

"A lot of this kind of research code goes up on the web, but the software is often either too specific, or too complex and inter-tangled," Barbič said. "Vega is now general purpose, well documented, and highly modular, with its components independently reusable. The code also intentionally avoids advanced C/C++ language constructs, so that it is accessible to a wide range of programmers."

At USC, home of North America's top-rated video game design program, students will be taught to integrate Vega into their games this fall. Though it is not an out-of-the-box application, Barbič says, "We are eventually going to try to get the system running in major 3D animation packages."

Barbič also hopes to use Vega in surgical simulations, using the system's ability to move, but not cut, its subjects.

The name "Vega" celebrates mathematician and physicist Jurij Vega, who shares Barbič's Slovenian heritage. Born in 1754, Vega calculated the value of pi to more than 10 digits.

In 2011, Barbič was included on Technology Review's annual "tr35: 35 Innovators Under 35" list for his work speeding up the simulations of complex objects.

Barbič will discuss Vega during his course presentation at SIGGRAPH 2012 in Los Angeles on Weds., Aug. 8.

Vega will be available at www.jernejbarbic.com/vega.

Provided by University of Southern California