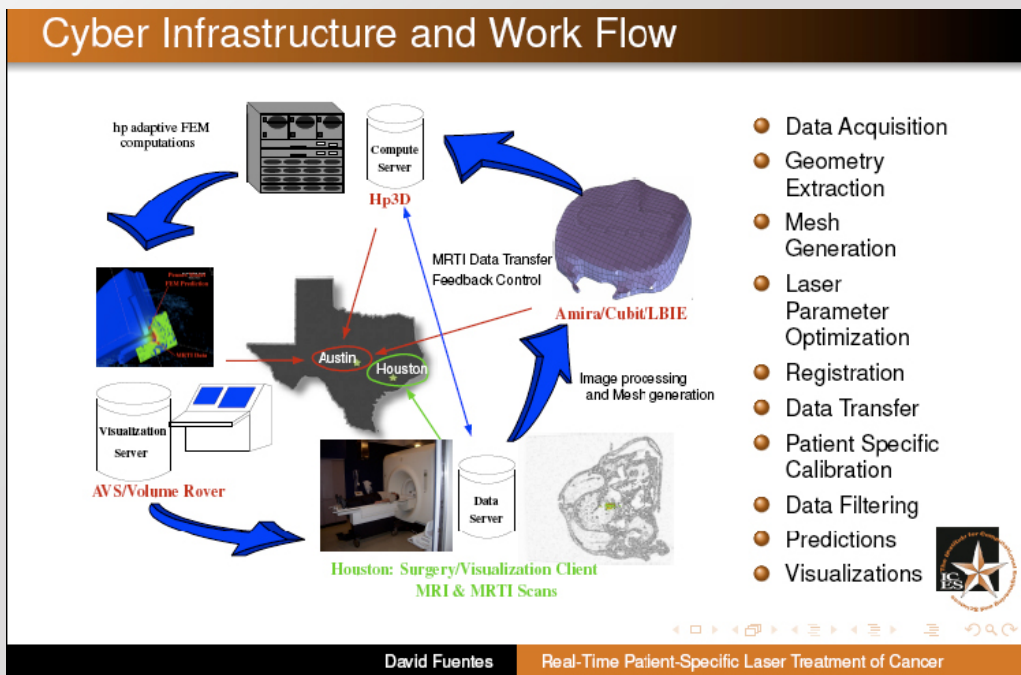


Supercomputer Performs Surgery On Canine Without Surgeon



In April 2008, the Lonestar supercomputer at the Texas Advanced Computing Center (TACC) in Austin performed laser surgery on a canine prostate in Houston without the help of a surgeon.

The procedure was a medical, technical, and computing breakthrough.

Using precise lasers, thermal imaging technology, and thousands of computer processors, Lonestar accomplished the laser treatment with greater control than a surgeon.

When a cancerous cell is heated or cooled beyond a certain threshold, it dies. With this new surgical treatment, a laser fiber is

A collaboration between the Texas Advanced Computing Center, The University of Texas at Austin, and M.D. Anderson Cancer Center showed how supercomputers can control lasers to destroy tumors before the storm made landfall in Galveston, Texas, on Sept. 13, 2008.

“We’re making surgery an engineering or mathematical process.”
Dr. J. Tinsley Oden, Institute for Computational Engineering and Science

inserted into cancerous tissue where it raises the temperature in a controlled way, destroying the tumor.

To enable Lonestar to perform this procedure successfully, scientists first developed a precise model of how a laser conducts heat across tissue and blood. Then, they used the model to teach the supercomputer to use the laser for precise, real-time surgery.

Destroying tumors with lasers isn't the only way supercomputers can help treat cancer. Cryotherapy, microwave and ultrasound treatments can all be adapted to work in a similar way, extending the reach of computerassisted medicine and saving lives.

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