

## Medical Image Processing in Neurosurgery, TU Dresden

### TASK

Neurosurgery places highest demands on precision in planning and carrying out an operation. A special challenge is the desire to remove any diseased tissue, such as tumors or aneurysms, as completely as possible while at the same time preserving the healthy tissue. To date, numerous different medical imaging techniques already exist which enable multi-modal imaging of the structures and functions of interest. However, when employing conventional methods of visualization the efficient use of such complex three-dimensional information for the planning and carrying out of therapeutic measures is only possible to a limited extent.

### SOLUTION

Our interdisciplinary study group including engineers, neurosurgeons, and neuroradiologists from Dresden University of Technology / Dresden University Hospital and Chemnitz Hospital, has developed a concept for a system which is based on the use of the image processing and visualization software Amira in combination with an autostereoscopic display and enables pre-operative surgery planning and post-operative analysis based on multi-modal three-dimensional medical data.

(see <http://www.et.tu-dresden.de/ibmt/mo/forschung/datenfusion/index.htm>)

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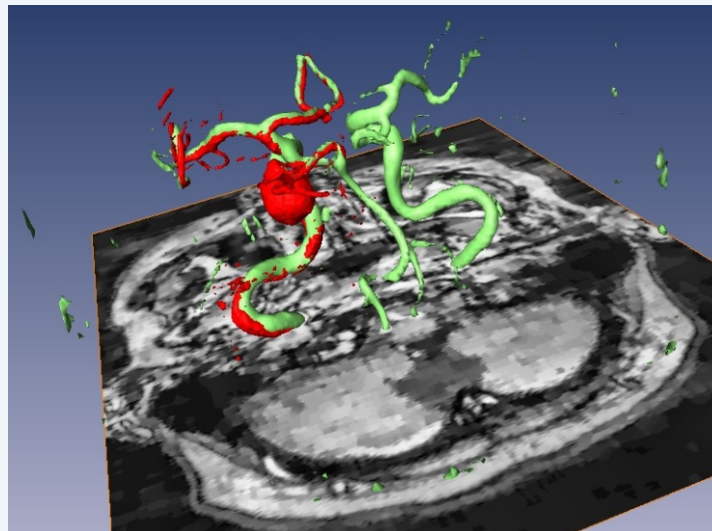
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*Aneurysm of the arteria carotis interna (pre-operative, red) and after therapy (post-operative, green)*

### RESULT

The use of the system with a 3D display allows for the three-dimensional visualization of complex scenarios which can be manipulated interactively. This ensures a more accurate pre-operative analysis of spatial relations and also eases post-operative analysis. From this, we expect to gain a higher level of precision and consequently improve surgery results.

