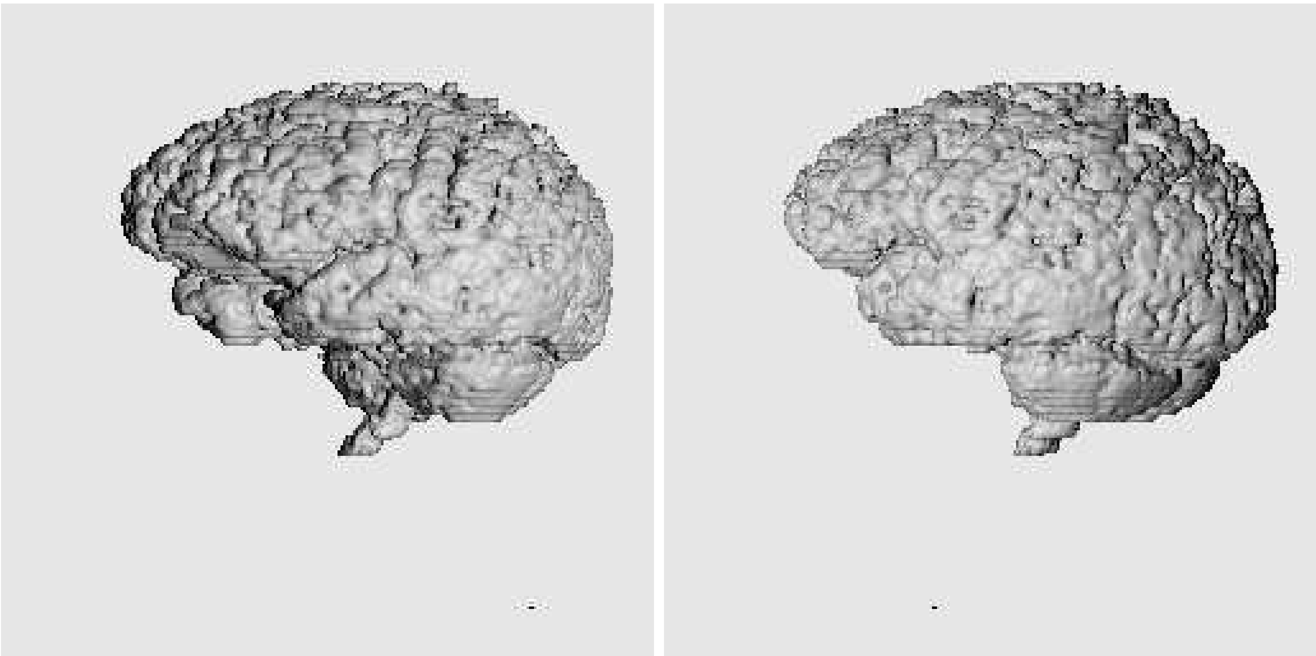
Medical imaging

We have started preliminary collaborations in areas related to *medical imaging*: image filtering and enhancement; MRI and PET data reconstruction; image segmentation; simulated staining; rotation and sectioning. Some of these themes are discussed in more detail in the following sections.

One of our first attempts at using CAM-8 in this context was for the viewing of MRI data. The simplest way to view spatial data from many vantage points is simply *shearing*—which in CAM-8 is an efficient primitive operation—as illustrated in the following figure (a brain as reconstructed from MRI data).

Two views of a brain, obtained by shearing the data



This technique can quickly generate the multiple sets of data needed for producing holograms from computer volumetric data. It also provided the stimulus for the more accurate (though somewhat slower) rotation methods discussed in the next section.

CAM-8 should also be useful for *reconstructing* three-dimensional surfaces from holographic data. The algorithm implemented in the HORN machine should run faster on CAM-8 than on the special-purpose HORN hardware.