962-65-673 **Jan Modersitzki*** (`modersitzki@math.mu-luebeck.de`), Insitute of Mathematics, Medical University of Luebeck, D-23560 Luebeck, Germany. *Image Registration of Histological Sections of the Human Brain.* Preliminary report.

Image registration still is a key problem within medical image processing. Especially if the images arise from a serie of sections through the human body. Here, a registration technique for nonlinear deformed images is presented. This method is based on the elasticity of the deformed tissue. The basic idea is to specify the deformation such that the distance between the images becomes small and the deformation is smooth. This approach leads to a minimization problem regularized by the elastic potential of the deformation. Our application deals with the reconstruction of a human brain based on high resolution flatbed scans. Since the size of the images can become large (up to 10.000-by-20.000 pixel), complexity of the algorithm is an issue. We present efficient schemes based on FFT-type techniques and demonstrate its performance for the real life application. (Received September 20, 2000)