Application of multiprocessor- and GRID technology in the data acqusition and medical image processing

Project summary

The aim of this project is to create high efficiency tomography devices and image manipulation programs for medical image processing using multiprocessor technology. We created a consortium for this purpose that consist of university and academy institutions and a company dealing with hardware and software development in the field of medical image processing.
Our industry partner needs new technologies to realize its mid-term strategy. This need perfectly matches the research at our laboratories, and this is the ground for a real consortial cooperation. Experiences gathered during the project will be realized in three levels: the industry partner can *widen the palette of its products* toward more efficient data collecting facilities and image processing tools, research centers can *increase the possibility of successful tenders*, and the *education of this technology* will also benefit from this. The two latter results indirectly strengthen the company's market position through the adaptation of new achievements in the field and the application of young researchers.
Two clusters built at the two university partners will serve as the infrastructural background for the research and development. The installation inside the academy network makes it possible to start basic research projects parallel with applied research on the clusters. In this way it will be possible to inspect the applicability of metacluster and GRID technology in the field of medical image processing. At present this slightly goes beyond routine diagnostics, but it can be an extremely promising field for medical applied and basic research (e.g. medicine effect or brain research).
The first task in the project is obtaining, building and testing the two clusters. Following this three parallel research and development projects will start: parallel processing of high speed digital signals coming from tomography detector systems, adapting 3D image reconstruction and correction algorithms for multiprocessor environment, and the development of a real-time, interactive 3D graphical diagnostic test program. In case of satisfactory speed parameters the latter can soon be integrated into the company's tomography diagnostics software products. The data collecting and reconstruction developments will serve as a basis for creating a new family of products.
Continuous development of created systems can be assured after project closing as the continuation of basic research with the help of Ph.D. and university students, which – together with the achievements – makes it possible for the knowledge and technology centers to cooperate further.