

The Basics

The research-group "Institut für Telematik" of the department for computer-science at the University of Trier is a research and development-center formally administered by the Fraunhofer Society and was established on January 1, 1998 and has since then evolved into an ever-growing competence center that develops solutions for problems in the interfaces between telecommunications and information technology. Around 30 scientific staff members from various countries who are experts in different areas of science are currently with the institute.

The scope of the working group "Institut für Telematik" covers a wide spectrum: From application-oriented information technology and telecommunications research to the development of customized solutions and pilot systems for commerce, industry, medicine and administration. It is also focusing on new media training and continued education, which is offered to cooperation partners as well as employees of companies domiciled in the region and in other areas.

Project Partners

High tech businesses, as well as large and even small and medium sized companies support the institute as project partners. The partner firms implement the institute's scientific findings in practical applications. The focus of the work is on the development and utilization of new information and communications media for technical, medical and social applications.

Areas of Competency

The current research and development projects aim at the practical implementation of the latest scientific findings in the areas of electronic publishing, Internet/Intranet, tele-medicine, secure data transfer, system development and analysis. The Institut für Telematik focuses primarily on the following technological applications:

- Editor systems: Web-based information and knowledge management
- Navigation systems: Processing of information, data interfaces, EAI, data warehouse
- Database management: Innovative middle-ware on open standard basis, e.g., Smart Data Server (SDS)
- Open network security: Architecture, policies
- Network security: Firewalls, Lock-Keeper, Tiger Teams, CERT
- Content security: Public-Key-Infrastructures, digital signatures
- Mobile technologies and applications: Ubiquitous Computing, Mobile Security, ad hoc-Networks, Smart Cards
- Tele-medicine: Patient CD, DICOM-image management and compression,
- Consulting: Studies, evaluations, audits

Patent Protection has already been awarded to the institute for two of its solutions: <Lock-Keeper> – a security <sluice> between Internet and Intranet, that protects users more effectively against online attacks than firewalls – and <Dicomzip> an image compression process that reduces the transmission times of medical images from several hours to just a few seconds.

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DICOMZIP

The Institut für Telematik has developed an image compression process that reduces the Internet transmission time for medical images from several hours to just a few seconds.

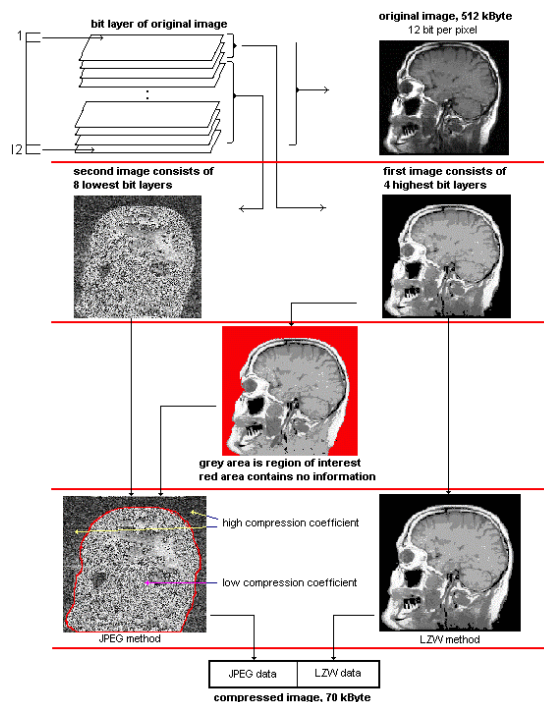
At this time, the processing of digital images in healthcare is subject to extremely high data volumes per image or image sequence. It requires extraordinary amounts of storage space. Transmission times continue to be unacceptably slow. This applies to emergency medical care (accidents) as well as to the outsourcing of medical data archives.

DICOMZIP was specifically designed for medical image processing and aims at overcoming these obstacles while meeting the high picture quality and speed standards of tele-medicine. Consequently, DICOMZIP compressed images can be transmitted via the Internet 70 - 90% faster (**speed**) and require 70 - 90 % less storage space (**cost reduction**).

DICOMZIP areas of application

- Radiology
- Computer tomography
- CAT scans
- Nuclear medicine
- Tomography
- Clinics
- Doctor's offices – particularly radiologists
- Hospital information systems
- Radiology information systems
- PACS
- Archiving
- Internet/ Intranet transmissions
- Telemetrics

Optimum image transmission and administration requires primarily two things: The data should be compressed in such a way that the compressed image can be transferred quickly and the amount of storage space required is reduced. The now patented system developed by the Trier-based Institute for Telematics (Institut für Telematik) achieves excellent compression results while keeping the transmitted data completely intact.



Compression process block diagram

During this adaptive compression process, the original image is divided into two pictures with different bit levels. One of these pictures contains all relevant information, which is compressed into a GIF file utilizing a smaller compression factor. The other picture, which con-

tains information that is not material for the medical diagnosis, is compressed severely, utilizing a JPG format. The consolidation of these different files into one file that contains complete image information enables users in the medical field, where speed can be a matter of life and death, to compress and decompress pictures in just a few seconds.

The Benefits of the System

- Easy to install, highly compatible
- User-friendly
- Simple compression and decompression
- No training time required
- System processes all DICOM formats
- Image quick view
- Compression report delivered after each compression and decompression
- Image parameters and patient data available separately
- Automatic image analysis and calculation of the optimum compression factor (maintaining a true image) based on file type, image content and image quality
- Compression rates from 1:3 to 1:10
- Mathematically true compression of diagnosis relevant image data
- Protects the original image until it is separately deleted by the user
- Original files are accidental deletion proof during compression and decompression!

DICOMZIP is marketed by ITM Services AG, Essen, Germany – the provider for medical and mobile software solutions.