

Contents

OPENING SESSION

Telecommunication - 100 Years ago

P. E. Peters (D)..... XLVII

Radiology in the Age of Computers - Achievements and Problems

A. R. Margulis (USA)..... LIII

Hospital of the Future - the Good, the Bad and the Ugly

S. Dangelat, H. Ingruber (A), W. Kroy, W. D. Rauh, H. Rüden, H.U. Lemke (D) LV

CAR

DIGITAL IMAGE GENERATION

Magnetic Resonance

Quantitative MR Mammography: Model Function and Determination of Minimal Temporal Resolution

V. Hietschold, St. Klengel, K. Köhler (D)..... 1

Advanced Subtraction Images in MR Mammography

J. Beier, H. Oellinger, B. Sander, E. Fleck, R. Felix (D)..... 8

Absence of "Silent" Multiple Sclerosis Lesions in the Brainstem Auditory Pathway

J.C. Gardner, L.G. Yaffe, R.A. Levine, B.C. Fullerton, St.M. Stufflebeam (USA) 14

Automated Quantification of Multiple Sclerosis Lesions by MRI FLAIR Imaging

D.C. Neth, R.M. Cothren, J.A. Tkach, T.J. Masaryk, J.F. Cornhill (USA) 21

Value of 3D High Resolution Imaging with CT Angiography (CTA) and MR Angiography (MRA) for Neurosurgical Operation Planning

K.-R. Atzor, J. Kalder, H.U. Kauczor, J. Tintera, U. Jendrysiak, A. Perneczky, P. Stoeter (D)..... 26

Fully Automated Analysis of Adrenoleukodystrophy from Dual-Echo MR Images

L. Aurdal, X. Descombes, H. Maître, I. Bloch, C. Adamsbaum, G. Kalifa (F)..... 35

Immersive Interaction Techniques for the Visualization of 3D Image Data of the Knee Joint Articular Cartilage

A. Lösch, F. Eckstein, K.-H. Englmeier, M. Haubner, H. Sittek (D) 41

First Results of Intraventricular 3D Endoscopy Based on MRI-Reconstructed Measurements

E. List-Hellwig, M. Meinhardt, D. Hellwig, B.L. Bauer, K.J. Klose, H.D. Mennel (D)..... 47

Computer Tomography

Integrated Abdominal CT Angiography <i>V. Raptopoulos, C.A. Gougoutas, J.D. Pearlman (USA)</i>	55
Evaluation of the Carotid Bifurcation by CT Angiography <i>G. Zöllner, M. Sadki, A. Klinkert, J.-L. Dietemann, R. Beaujeux(F)</i>	60
Digital Bone Structure Analysis from Computer Tomographs of the Human Lumbar Spine <i>N. Meier, T.M. Link, M. Fiebich, U. Bick, H. Lenzen, P.E. Peters (D)</i>	67

Digital Radiography

Wilhelm Conrad Röntgen - Evolution of X-Ray Applications 1895-1995 <i>E. Ammann (Invited Speaker) (D)</i>	77
The Physics of a New Direct Digital X-Ray Detector <i>D.L. Lee, L.S. Jeromin, L.K. Cheung (USA)</i>	83
Accuracy and Agreement of Readings on Screen - Film and Digital Radiography Portable Chest Radiography <i>H.L. Kundel, D. Wells, W. Gefter, J. Aronchik, W. Miller Sr., W. Miller Jr., M. Polansky, (USA)</i>	89
Bone Quality Evaluation in Ilizarov Procedures Using CR: a Preliminary Investigation <i>M. Kruger, G. Hägglund, K. Jonsson, G. Sundén (S)</i>	95
3D Vessel Reconstruction Based on Rotational Angiography <i>R. Koppe, E. Klotz, J. Op de Beek, A. Aerts (D)</i>	101
High-Performance Digital Mammography <i>R.B. Schilling, S.R.D. Sharma, S. Gaalema, J. Minter, W. Yorke, J. Cox (USA)</i>	108
A Direct Radiography System for the Future <i>L. S. Jeromin, D.L. Lee, E. F. Palecki, E. N. Lawrence (USA)</i>	110

IMAGE PROCESSING AND DISPLAY

Radiological Imaging in the Second Century After Röntgen: Realistic and Intelligent <i>K.H. Höhne (Invited Speaker), B. Pflesser, A. Pommert, M. Riemer, Th. Schiemann, R. Schubert, U. Tiede (D)</i>	117
X-Ray Segmentation Using a Texture-based Wavelet Approach <i>I. Bergener, E. Pelikan, T. Tolxdorff, R. Repges (D)</i>	125
Segmentation of Volume Data by Contour Fragment Grouping <i>T. Vehkomäki, G. Gerig, G. Székely (CH)</i>	131
Contour Fitting Using Stochastic and Probabilistic Relaxation for Cine MR Images <i>D. Rueckert, P. Burger (UK)</i>	137

Semi-automatic Markov-Model-Based Segmentation of 3D Medical Images <i>C. Fassnacht, K. Neumann (D)</i>	143
Automatic Analysis of Medical Images Using a Deformable Textbook <i>G.E. Christensen, M.I. Miller, J.L. Marsh, M.W. Vannier (USA)</i>	146
Digital Atlas-Based Segmentation of the Hippocampus <i>J.W. Haller, G.E. Christensen, S. Joshi, M.I. Miller, M.W. Vannier (USA)</i>	152
Illusory Contour Models can be used as Fuzzy Operators in Medical Image Processing <i>G. Glombitza, M. Makabe, H.P. Meinzer (D)</i>	158
Automatic Volumetric Segmentation of Three-Dimensional Medical Images <i>H. Tek, B.B. Kimia (USA)</i>	164
Optimization Neural Networks for the Segmentation of Brain MRI Images <i>R. Sammouda, N. Niki, H. Nishitani (J)</i>	171
Dynamic 3D Reconstruction of the Left-Ventricular Endocardium: an MRI-Data-Based Approach Using a Neural Network <i>A. von Smekal, K.C. Seelos, J. Lange, M. Reiser (D)</i> <i>see Appendix page</i>	1393
Blood Vessel Segmentation and Visualization in 3D MR and Spiral CT Angiography <i>B. Verdonck, I. Bloch, H. Maître (F); D. Vandermeulen, P. Suetens, G. Marchal (B)</i>	177
Object-Centered Description for Analysis and Display of the Cerebral Vascularity <i>T. Koller, G. Gerig, G. Székely (CH)</i>	183
Modelization of the Left Ventricle and its Deformations Using Superquadrics and Hyperquadrics <i>A. Robert (F)</i>	189
Integrated Visualization of Quantitative Information with Anatomical Surfaces <i>K.J. Zuiderveld, R. Stokking, M.A. Viergever (NL)</i>	195
3D Reconstruction of Coronary Arteries from X-Ray Projections <i>A. Hildebrand, St. Grosskopf (D)</i>	201
Application of Accurate 3D Reconstruction from Biplane Angiograms in Morphometric Analyses and in Assessment of Diffuse Coronary Artery Disease <i>A. Wahle, E. Wellnhofer, I. Mugaragu, A. Trebeljahr, H. Oswald, E. Fleck (D)</i>	208
Intensity Correction and its Effect on Measurement Variability in MRI <i>A.P. Zijdenbos, B.M. Dawant, R. A. Margolin (CDN)</i>	216
Quantitative Analysis of Blood Vessels Using Cone-Beam CT Images <i>Y. Kawata, N. Niki, T. Kumazaki (J)</i>	222
Vector Field Analysis of the Dynamics of the Heart Using Velocity-Encoded NMR Images <i>G.I. Sanchez-Ortiz, P. Burger (UK)</i>	228

3D Detection and Representation of Cortical Sulci <i>G. Le Goualher, C. Barillot, L. Le Briquer, J.C. Gee, Y. Bizais (F)</i>	234
Foetal Visualization Using 3D Ultrasonic Data <i>G. Sakas, S. Walter, W. Hiltmann, A. Wischnik (D)</i>	241
Automated 3D MR and PET Brain Image Registration <i>C. Studholme, D.L.G. Hill, D.J. Hawkes (UK)</i>	248
Interpretation Support of Contrast-Enhanced MR Mammography by Image Processing <i>M. Makabe, G. Glombitza, A. Mayer, H.P. Meinzer, W. Lederer, S. Schneider, W. Wradzidlow (D)</i>	254
Fractal Feature Analysis and Classification of MS Lesions <i>J.A. Schnabel, L. Wang, D. Rueckert, S.R. Arridge (UK)</i>	260

MEDICAL WORKSTATIONS

The Seven Venal Sins of User Interface Design <i>A.H. Rowberg (Invited Speaker), J. Ramey (USA)</i>	269
Detection of Artificial Bone and Lung Lesions Using a High-Resolution Projector <i>M. Fiebich, T.M. Link, W. Strebelt, W. Mueller, R.R. Vohsbeck-Petermann, P.E. Peters (D)</i>	276
Interpretation of Multiple Chest CT Examinations: Stacked Workstation Versus Film <i>D.V. Beard, P.L. Molina, K.M. Denelsbeck, B.M. Hemminger (USA)</i>	282
Integrated Radiological Reporting Workstation for Efficient Clinical Communication <i>Th. Wendler, R. Grewer, K.J. Mönich, J. Schmidt, H. Svensson (D)</i>	287
A PACS Workstation with Integrated Case Tool and 3D Endosonography Application <i>T. Grunert, J. Fechter, G. Stuhldreier, H.-H. Ehrlicke, M. Skalej, R. Kolb, P.E. Huppert (D)</i>	253
Multimedia Report System of Ultrasonography: Diagnosis of Acute Abdomen <i>N. Nakata (J)</i>	299
Dr Razz: 16-bit Image Display Program for Macintosh Computers <i>Th. Gillespy III, A.H. Rowberg (USA)</i>	304

EXPERT SYSTEMS AND COMPUTER ASSISTED EDUCATION

Artificial Intelligence in Radiology Education: the Promise, the Delivery, the Future <i>R.T. Macura (Invited Speaker), K.J. Macura (USA)</i>	313
Concept and Application of Multimedial Radiologic CD-ROM Data Base <i>M. Walz, A. Bode, K.J. Lehmann, R. Loose, J. Teubner, M. Georgi (D)</i>	318

Multimedia-Based Teaching File for Radiological Cases Diagnosed with 3D Images and Models from CT and MR Modalities <i>I. Kasem, J. Ueno, H. Nishitani (J)</i>	323
Undergraduate Radiology Education Utilizing WWW Server-Client System <i>H. Nishitani, S. Yoshida, J. Ueno, K. Watanabe, I. Kasem (J)</i>	328
CADIAG-2/Rheuma-Radio: An Expert System to Assist in Establishing Radiologic Diagnoses in Rheumatology <i>K. Boegl, F. Kainberger, K.-P. Adlassnig, G. Kolarz, G. Kolousek, H. Leitich, H. Imhof (A)</i>	330
An "Expert Assistant" for Chest X-Rays Based on Anatomical Models <i>L.S. Wilson, M.S. Brown, H.E. Talhami, R.W. Gill, C. Sun, B.D. Doust (AUS)</i>	336

COMPUTER ASSISTED DIAGNOSIS

Computer-Aided Diagnosis: Early Clinical Experience with Intelligent Workstation <i>K. Doi (Invited Speaker), R.M Nishikawa, M.L. Giger, R.C. Haldemann, R.A. Schmidt, D.E. Wolverton, H. MacMahon (USA)</i>	345
CADx in Digital Mammography: Classification of Microcalcifications for the Diagnosis of Breast Cancer <i>Ch. Wu, A. Hasegawa, M. Freedman, R. Zuurbier, S.K. Mun (USA)</i>	352
A New Single-Image Method for Computer-Aided Detection of Small Mammographic Masses <i>U. Bick, M.L. Giger, R.A. Schmidt, K. Doi (D)</i>	357
Comparison Between Neural Networks and Classical Methods for the Detection of Microcalcifications <i>G. Zöllner, M. Sadki, M. Bruynooghe, A. Klinkert, J.-L. Dietemann (F)</i>	364
Computer Assisted Lung Cancer Diagnosis Based on Helical CT Images of Mass Screening <i>K. Kanazawa, M. Kubo, N. Niki, H. Satoh, H. Ohmatsu, N. Moriyama (J)</i>	369
Computer-Assisted Diagnosis of Brain Tumours Using Fractals, Texture and Morphological Image Analysis <i>C. Roßmanith, H. Handels, S.J. Pöpl, E. Rinast, H.D. Weiss (D)</i>	375

EuroPACS

HOSPITAL INTEGRATION AND MEDICAL EVALUATION

A Customer-Focused Approach to Digital Information Management - the Connectivity Program <i>A. Freybott (Invited Speaker), R. Feindt (D)</i> see Appendix page.....	1333
Ultra-High-Ratio Wavelet Compression of Brain MRI: a Pilot Study <i>D. Schomer, J. Hazle, A. Elekes, W. Schmidt, L. Ginsberg, A. Kumar, N. Leeds, W. Murphy (USA)</i>	383

Assessment of ITACA's Compression Methods on Digital Coronary Angiogram <i>L. Portoni, C. Combi, F. Pincioli, G. Pozzi, H.P. Fritsch, R. Brennecke (I)</i>	389
HIPIN, a Working HIS/RIS-PACS Interface <i>F.J. Martens, F.P. Ottes, P.J. Toussaint, C. Schulz (NL), R. Rechid (D), R. v. d. Broeck (B)</i>	395
A New Radiology Information System with Direct Filing of Images <i>P. Pavone, M. Marsella, A. Laghi, C. Catalano, V. Panebianco, V. Campanella, R. Passariello (I)</i>	401
Integration of RIS, NIS and PACS <i>R. Rechid, H.W. Fritsch, K. Joseph, K.J. Klose (D)</i>	408

STANDARDIZATION - INTEGRATION AND IMPLEMENTATION

Fusion of PACS and HIS Becoming a Reality <i>A. Bakker (Invited Speaker), A. Osseyran (NL)</i>	417
Implementation of a DICOM to HL7 Gateway for RIS/PACS Communication <i>St.L. Fritz, S. Munjal, J. Connors, D. Csipo(USA)</i>	425
OSI Conformance Testing and DICOM Protocols <i>P. Jensch, M. Meyer, M. Eichelberg, A.J. Hewett (D)</i>	432
Integrating HIS and PACS: The DICOM Solution <i>H. Garfagni, B. Klipfel (F)</i>	438
A C++Class Library for DICOM and HL7 <i>St.L. Fritz, S. Munjal, J. Connors, D. Csipo (USA)</i>	445
Management of DICOM Data Structures an Object-Oriented Approach <i>M. Eichelberg, G. Ehlers, A.J. Hewett, P. Jensch (D)</i>	452
IPI-IIF Profile for the Conversion of DICOM Images <i>A. Barth , C. Schuschke, P. Jensch (D)</i>	458
The PAPYRUS Image File Format Based on DICOM Standard <i>O. Ratib, C. Girard, Y. Ligier (CH)</i>	464
Open Image Management with DICOM, a Phased Approach <i>J.P. Neumann, Ch.R. Parisot, B. Klipfel, M.S. Beaver, T. Sippel (F)</i> see Appendix page	1396
On-Demand Conversion of Proprietary Image Formats to DICOM 3.0 <i>D.P. Reddy, M.E. Noz, G.O. Maguire Jr., J.J. Sanger, D. Garza, St.F. Horowitz (USA)</i> see Appendix page	1339

PACS ARCHITECTURE AND PLANNING

The San Francisco Bay Area ATM Networks <i>H. K. Huang (Invited Speaker), R. Arenson (USA)</i>	475
--	-----

Development of an Integrated Image Management and Communication System on Crete <i>S. Orphanoudakis, M. Tsiknakis, C. Chronaki, S. Kostomanolakis, M. Zikos, Y. Tsamardinos (GR)</i>	481
IDPACS - a PACS Architecture Based on DICOM <i>B. Fasel (D)</i>	488
From the MIMOSA Model to the Implementation of a Demonstrator at the University Hospital of Rennes <i>B. Gibaud, B. Hervault, B. Bares, H. Garfagni, Y. Gandon, E. Lussot, L. Bourgeois, J.C. Quideau, B. Klipfel (F)</i>	494
Open Digital Image Archives: Traffic for the Hospital ATM Infobahn <i>M. Ohly, L. Kleinholz, H. Oswald, B. Buggermann, R. Felix, E. Fleck (D)</i>	499
Status of Hastings PACS: Development, Reconfiguration and Design of Hardware Modifications, RIS Integration and DICOM Migration in Functional Segments <i>N.J. Tomlinson, K.D. Foord (UK)</i>	see Appendix page..... 1401
Functional Requirements for the Nuclear Medicine PACS <i>F.P. Ottes, J.A.K. Blokland, J. Blom, R.O. Boer, A. van Lingen, P.J. Toussaint, R.J. Weber (NL)</i>	505
Small-Size PACS for Image Communication Between Radiology and Intensive Care Unit (ICU) <i>B. Wein, M. Kilbinger, F. Vogelsang, R. W. Guenther, A. Keizers, Ch. Schilling, J. Siemers, K. Munker, M. Dahm, M. Rispler, D. Meyer-Ebrecht, R. Breuer, W. Behrendt(D)</i>	512
Bright Ideas vs. Workaday Routine: PACS Traps and Pitfalls <i>M. Wiltgen, R. Pitzler, A. Kainz, G. Gell (A)</i>	516
Saitama Medical School PACS System <i>S. Tsukuda, A. Heshiki (J)</i>	521
PACS - Clinical Implementation Now, Later, or Never? <i>G. Haufe, H. Weiss (D)</i>	525
MIRIAM, PACS Project of the Assistance Publique - Hôpitaux de Paris <i>A.-M. Forte, J.-E. Lefevre, L. Cazier, J. Becker, H. Vu Thanh, R. Allouche (F)</i>	528
IMPLEMENTATION REPORTS	
Large Picture Archiving and Communication Systems (PACS) <i>R.A. Bauman (Invited Speaker) (USA)</i>	537
Integration in the BERMED Project: The Multimedia Patient Record <i>M. Ohly, L. Kleinholz, H. Oswald, B. Mahr, R. Felix, E. Fleck (D)</i>	542
The Clinical Experiences with PACS and Simlogix Networks Outside the Radiological Department <i>F.E. Lindhardt (DK)</i>	548

Technology Assessment of HIS/RIS/PACS by Means of Comparison Between Pre-Post Operations

K. Inamura, T. Umeda, H. Kondoh, T. Kozuka (J) 552

PACS at the Edge: Strategies to Improve Their Performance

J. Piqueras, J.C. Carreño, O. Giménez, J. Mundet, C. Batista, G. Pascual, J. Gutiérrez (E) 558

Evaluation of the Image Handling Throughput of an Integrated RIS/PACS System in Daily Operations (Toshiba Hospital Experience)

E. Nishihara, H. Kura, H. Ohkubo, G. Kubota, N. Okazaki (J) 563

Quantitative Evaluation of Reporting from Monitor in Comparison to Hardcopy

*M. Wiltgen, G. Gell, A. Kainz, R. Pitzler, F. Ebner, R. Kern, F. Fazekas, P. Kapeller,
R. Stollberger (A)* 570

Image Management Systems - Improving the Cost/ Benefit Ratio

B. Semann, V. Wetekam (D) 575

A New Concept of Personal Computer-based Hospital-wide PACS: HIS-RIS-PACS Coupling

*Y. Sukenobu, H. Kondoh, J. Ikezoe, H. Nakamura, Y. Mori, M. Sasagaki, K. Inamura,
T. Kozuka (J)* 582

ISPRAD

Health-Economic Aspects of Medical Technology

G. Neubauer (Invited Speaker), R. Bantle (D) 587

Image Management and Communication: a Legal Perspective

C. Laske (Invited Speaker) (B) 594

Privacy and the „Open“ PACS

U. Schrader, E. Kotter, E. Pelikan, A.W. Zaiss (D) 605

Technology Introduction in a Cost Conscious Age: Image-Guided Therapy

S.M. Blumenfeld (Invited Speaker) (USA) 611

What has Technology Assessment to offer to Radiology?

E.M.S.J. van Gennip (Invited Speaker), A.R. Bakker (NL) 620

Fever in HIV-Infected Patients. Cost Effectiveness of Chest X-Ray

R. Maroldi, G. Battaglia, P. Maculotti, P. Cabassa, A. Chiesa (I) 625

Cost of Useless Information when Imaging Head and Neck Neoplasms

R. Maroldi, G. Battaglia, P. Maculotti, A. Chiesa (I) 629

Concept for a PACS-Aided Quality Assurance in Radiology

E. Kotter, U. Schrader, R. Klar, M. Langer (D) 633

What About Advanced Applications in Healthcare? - Beyond Radiology -

J.P.J. de Valk, A. Edvardsen, A.H.M. Mase (NL) 637

Digital Image Archiving, Teleradiology, Virtual Reality, Legal Requirements and Emerging Solutions <i>O. Rienhoff (Invited Speaker) (D)</i>	645
Health Care Reform in the United States: Observations on the Conditions that led to the 1993 Reform Proposal, the 1994 Impasse, and some of the Prospects for the Mid-Nineties <i>G.V. Heller (Invited Speaker) (USA)</i>	649
Pitfalls in Planning Radiology Departments <i>J.H. Göthlin (Invited Speaker) (S)</i>	656
Setting up a Large Organ-Systems Oriented Radiology Department Using PACS <i>J. Piqueras, J. Lucaya, J.-C. Carreño (E)</i>	659
Development and Evaluation of a New Hospital-Wide Order-Entry and Reporting System <i>H. Kondoh, Y. Sukenobu, J. Ikezoe, H. Nakamura, Y. Mori, M. Sasagaki, K. Inamura, T. Kozuka, (J)</i>	664
Radiology Suite Sterility Needs for Interventional Procedures <i>H.E. Schütte, J.S. Laméris, J. Bakker, H. van Overhagen (NL)</i>	669

TELERRADIOLOGY

MEDICAL ACCEPTANCE

The Visible Human Male for Teaching and Reference in Radiology <i>R.F. Kilcoyne (Invited Speaker), V.M. Spitzer, D.G. Whitlock, A.L. Scherzinger, D. Rubinstein, P. Russ (USA)</i>	667
An Evaluation of Indirect Patient Costs and Teleradiology in a Rural Nebraska Hospital <i>P.E. Hilsenrath, K. Turner, E.A. Franken, W. Smith (USA)</i>	684
Clinical Trial of Digital Teleradiology in the Diagnosis of Osteoarticular Disorders <i>J. Martel, M.D. Jiménez, J. Escribano, R. De la Cruz, P. Ramos, I. Fernández, J. Días, J. Martín-Santos (E)</i>	690
Accuracy of Diagnosis of Subtle Chest Disease on Digitized Images <i>D.A. Lynch, A. Larson, B. Zeligman, C. Harlow, R.F. Kilcoyne, G. Thieme (USA)</i>	694
Experiences from 2 ½ Years of Routine Teleradiology <i>T. Sund, J. Størmer (N)</i>	697
Evaluation of a Teleradiology Pilot Project Between Royal Alexandra Hospital for Children and Nepean Hospital, Sidney, Australia <i>B.L. Crowe, D.M. Hailey, M. de Silva (AUS)</i>	703

TELECONSULTATION A Neurosurgical Image Transfer System for the Daily Routine and in Emergency cases. A 4 Year Study <i>V. Urban, Ch. Busert, N. Huewel, A. Pernecky (D)</i>	<i>see Appendix page</i> 1346
--	-------------------------------------

REGIONAL / NATIONAL - INFRASTRUCTURE INITIATIVES

Teleconferencing in Oncology via ISDN <i>S. von Gehlen, M. Eichelberg, A. Hewett, T. Kummerow, P. Jensch (D)</i>	711
Establishing a National Teleradiology and International Consultation Network <i>T. Palsson, A. Brekkan, A. Eiriksson (IS)</i>	717
Nordic Telemedicine Consultation Network Using Internet <i>J. Reponen (SF), T. Palsson, O. Kjartansson (IS), E. Ilkko (SF), J. Størmer (N), M. Päiväsalo, J. Pyhtinen, J. Laitinen (SF), A. Eiriksson, A. Brekkan (IS)</i>	723
A Scalable Global Teleradiology System <i>B.K.T. Ho, W. Chao, Z.-M. Jiang, K. Chang, H. Kangarloo, R. Steckel (USA)</i>	729
Distributed Medical Services Within the ATM-Based Berlin Regional Testbed <i>J. Bernarding, M. Krauss, S. Schulz, A. Thiel, T. Tolxdorff (D)</i>	735

TECHNICAL ISSUES

Low-Resolution Telemedicine Images for Consultation in Pediatric Radiology <i>E.A. Franken, Jr. (Invited Speaker), K.S. Berbaum, G.G. Cox, J.A. Johnson, C.J. Meoli, M.L. Redick, Y. Sato, F.G. Seidel, W.L. Smith (USA)</i>	743
Multimedia Medical Conferencing: Standards, Products, ATM, ISDN, and Other Technical Perspectives <i>L. Kleinholz, M. Ohly, J. Ricke, J. Thomsen, D. Emmel, E. Fleck, R. Felix (D)</i>	748
Computer-Supported Cooperative Work and Image Analysis in Teleradiology <i>H. Handels, Ch. Hahn, J. Miehe, A. Will, P. Bernardes, Ch. Busch, V. Kühn, E. Rinast, H. Putzar, K. Rösler (D)</i>	754
Low-Cost Image Consultation Workstations Utilizing ISDN and Personal Computers <i>J.W. London, D.E. Morton, R.L. Comis (USA)</i>	759
Teleradiology Conference over Low-Speed Telephone Lines using Locally Replicated Image Data <i>T. Sund, F. Kileng (N), Y. Ligier (CH)</i>	765
Automated Reporting of Radiology Interpretations - SIREP Revisited <i>D. Bartelt (Invited Speaker), O. Pohlenz, K. Ziegler (D)</i>	769

COMPUTER AIDED SURGERY - CAS

3D GRAPHICS FOR CAS

Evaluation of UNIX Notebook Computers for ANALYZE <i>U. Bitté (USA)</i>	779
Evaluation of Digital Surgical Simulation <i>V.V. Patel, M.W. Vannier, J.L. Marsh, L.-J. Lo (USA)</i>	783
Craniofacial Surgical Simulation and Outcome Validation <i>L.-J. Lo, J.L. Marsh, V.V. Patel, M.W. Vannier (USA)</i>	789
The Diagnostic Value of 3D CT in Cranio-Maxillofacial Surgery <i>F.R. Carls, B. Schuknecht, A. Valavanis, H.F. Sailer (CH)</i>	795
Surface Matching: Application in Post-Surgical / Post-Treatment Evaluation <i>H. Xiao, I.T. Jackson (USA)</i>	804
3D-Based Textbook for Human Body Education <i>T. Matsuda, T. Umehara, H. Chiyokura, M. Kobayashi (J)</i>	812
From Diagnostic Imaging to Image-Guided Therapy in Patient-Focused Care <i>N. Rossing (Invited Speaker), T. Darvann, S. Kreiborg, P. Larsen (DK)</i>	818

NAVIGATION

Programmed, Computer-Assisted Guidance in Surgery <i>U.G. Kliegis, J. Hezel, H.M. Mehdorn (D)</i>	827
PICSEL: Computer-Aided Surgery <i>P. Collet, R. Gooch, F. Allouche (F)</i>	833
Computer-Assisted Orthopaedic Surgery - An Application in Spine Surgery <i>H. Visarius, L.-P. Nolte, U. Berlemann, C. Ozdoba, O. Schwarzenbach, E. Arm, B. Jost (CH)</i>	838
Advantages and Drawbacks of Intraoperative Navigation Systems in Oral and Maxillofacial Surgery <i>G. Enislidis, O. Ploder, A. Wagner, M. Truppe, R. Ewers (A)</i>	844
Preoperative Image Processing in a Computer Assisted Neurosurgical Planning and Guidance System (VISLAN) <i>J. Zhao, A.C.F. Colchester (UK)</i>	847
A Multimodality Workstation for Use in Neurosurgery and Neuroradiology <i>H. Barfuss, R. Graumann, D. Petersen (D)</i>	853
Free-Hand Stereotactic Computer-Assisted Surgery <i>K.R. Smith, R.D. Buchholz, K.T. Foley (USA)</i>	859
Computer-Aided Stereotaxic Neurosurgery for Movement Disorders - an Object-Oriented Design <i>H.-G. Lipinski, K. Brauer, H. Stimmer, A. Struppler (D)</i>	864

LASER SCANNING AND FACIAL MOTION

Computer-Aided Otoplasty: 3D Visualization and Modeling of Rib Cartilages from Ultrasonography Data

T. Kaneko, M. Kobayashi, T. Fujino, K. Ohkuma, K. Hiramatsu, T. Mochizuki, E. Kasahara (J) 873

Simulation for Facial Lip Expression Using the Facial Muscle Model

I. Tanaka, M. Kobayashi, T. Fujino, H. Chiyokura (J)..... 878

MODELS & PROTHESIS: TECHNICAL

Anatomical Models in Surgery Planning - Applications and Manufacturing Techniques

U.G. Kliegis, R. Ascherl, H. Kaercher (D) 885

Anatomic Facsimile Models. Procedure - Examples - Trends

A. Gebhardt, J.J. Bier, B. Hell (D) 893

Stereolithography of the Skull: Effect of CT Filter Kernel Selection on Bone Segmentation

A. Sichtung, V. Hietschold, K. Köhler (D)..... 900

Method for Preparing an Exact-Size Model Using Helical Volume Scan CT Data and its Clinical Significance

I. Ono, H. Gunji, T. Tateshita, F. Kaneko (J) 903

Preoperative Planning and Surgical Tools with Spiral CT and Rapid Prototyping

Th. Fleiter, R. Niemeier, J. Bauer (D), J.M. Brown (GB)..... 909

Computer-Aided Design (CAD) and Rapid Prototyping in Experimental Radiology

M. Schaich, R. Niemeier, J. Bauer, Th. Fleiter, C.D. Claussen (D) 913

MODELS & PROTHESIS: CLINICAL

Craniofacial Landmarks, Models and Prostheses

D.J. Netherway, A.H. Abbott, J.R. Abbott, D.J. David (AUS) 921

The Femoral Component for Secondary Osteoarthritis of the Hip Joints in Japan

A. Bo, S. Imura, Y. Okumura, H. Oomori, H. Takedani, M. Ando (J) 927

Technique for Better Execution of CT Scan Planned Orthopedic Surgery on Bone Structures

K. Radermacher, H.-W. Staudte, G. Rau (D)..... 933

Preoperative 3 D Model Planning for Reconstruction of the Maxilla and the Mandible

W. Milesi, M. Rasse, R. Eglmeier, A. Lindner, G.A. Schobel, I. Friede (A) 939

Computer-Aided Individual Transplant Design for Reconstruction of the Mandible

H.-F. Zeilhofer, R. Sader, R. Kirsten, M. Lenz (D)..... see Appendix page 1353

Maxillofacial Asymmetry Related to the Occlusal Plane? - CAS with Laser Technology Models <i>H. Schiel, B. Hammer, A. Jacob, J.Th. Lambrecht (CH)</i>	<i>see Appendix page</i> 1359
--	-------------------------------------

Preoperative 3 D Model Planning in Secondary Corrections of Established Posttraumatic Midface Deformities <i>G. Enislidis, G.A. Schobel, W. Millesi, M. Rasse, A. Baumann, A. Lindner (A)</i>	945
--	-----

COMPUTED MAXILLOFACIAL IMAGING - CMI

Computed Maxillofacial Imaging : Perspectives and Prospectives <i>A.G. Farman (USA)</i>	949
--	-----

CAR - CAD/CAM - CAS: 3D Perspectives <i>J.Th. Lambrecht, H. Schiel, A.L. Jacob, Th. Kreuzsch (CH)</i>	<i>see Appendix page</i> 1364
--	-------------------------------------

CAS AND CAD/CAM IN CMI

CT-Data-Based Construction of a Dental Drilling Device <i>J. Bauer, T. Kaus, T. Grunert, Th. Fleiter, R. Niemeier, M. Schaich (D)</i>	958
--	-----

Computer-Aided Single Tooth Restoration <i>D. Edinger, K. Rall, P.v. Schroeter, S. Ehrenreich (D)</i>	964
--	-----

Interactive Segmentation of Dentistry Range Images in CIM Systems for the Construction of Ceramic Inlays Using Edge Tracing <i>P.J. Neugebauer (D)</i>	969
---	-----

DIGITAL DENTAL IMAGING

Evaluation of Digital Systems for Intraoral Radiography: What is the Necessary Standard? <i>H.G. Gröndahl (Invited Speaker) (S)</i>	977
---	-----

Imaging Plate for Intraoral Computed Radiography <i>I. Kashima (Invited Speaker), T. Matsuki (J)</i>	984
---	-----

Signal-to-Noise Performance of a Digital Dental X-Ray Detector <i>W. Hillen, J. Bockemühl, W. Schmitt (D)</i>	990
--	-----

Optimum Exposure at Various Settings of Tube Voltage with the CDR System <i>Y. Hayakawa, A.G. Farman, W.C. Scarfe, K. Kuroyanagi, D.S. Schick (USA)</i>	996
--	-----

The New Siemens Orthophos Digital, a Direct Digital Dental Panoramic Radiography System <i>St. Hassfeld, J. Zöller, R. Wiedenmann, J. Mühling (D)</i>	1002
--	------

Dental Implant Surgery Controlled by Digital X-Ray Imaging <i>W. Schmitt, Th. Lehmann (D)</i>	1008
--	------

ADVANCED APPLICATIONS IN MAXILLO-FACIAL IMAGING

Fractal Dimensions of Malignant and Premalignant Oral Lesions - Their Value in Diagnosis and Prognosis <i>J.W. Rippin (Invited Speaker), G. Landini (UK)</i>	1015
A Pilot Study of Automated Knowledge-Based Recognition of Facial Bones from Axial CT Slices <i>D.K. Benn (Invited Speaker), J.C. Pettigrew, M. Shim, A.F. Laine, A.A. Mancuso, C.D. de Bose, H.E. Stambuk (USA)</i>	1021
Micro-CT in Maxillofacial Imaging <i>P.F. van der Stelt, St.M. Dunn (NL)</i>	1028
Preprocessing by Unsharp Masking Technique for Improvement of 3D CT Images of the Middle Third Facial Fractures <i>K. Yamamoto, K. Nishikawa, T. Harada, M. Tanimura, K. Kuroyanagi (J)</i>	1033
Mandibular Condyle Motion: Comparison of Videofluoroscopy, Cineradiography, and MRI <i>E.A. Brandser, J.W. DeVocht, D. Lew, E.A. Hoffman, V.K. Goel (USA)</i>	1037
Linkage Between Computer-Assisted Recordings of Condyle Movements and MR Imaging of the TMJ <i>B. Kordaß, A. Hugger, J. Assheuer, U. Stüttgen (D)</i>	1043
Computed Sonographic TMJ Imaging for Function Analysis <i>R. Sader, H.-F. Zeilhofer, H. Deppe, H.-H. Horch, B. Kling (D)</i>	1048
Preoperative Visualization of Aesthetic Changes in Orthognathic Surgery <i>H.-F. Zeilhofer, R. Sader, H.-H. Horch, H. Deppe (D)</i> see Appendix page	1369

IMAGE GUIDED THERAPY - IGT

VIRTUAL REALITY

Virtual Echography: Simulation of Ultrasonic Examination <i>D. Henry, J. Troccaz, J.-L. Bosson (F)</i>	1055
Computer-Aided Surgery in Plastic and Reconstructive Surgery Using Laser Lithography Models and Virtual Reality Technique <i>M. Kobayashi, T. Fujino, T. Kaneko, I. Tanaka, H. Chiyokura, T. Kurihara, T. Noda, K. Enomoto, K. Shiohata, Y. Momose, K. Kanbe, K. Shinozaki, N. Fuku (J)</i>	1061
3D-Endoscopic Surgery <i>O. Ploder, A. Wagner, G. Enislidis, M. Truppe, R. Ewers (A)</i>	1066
Evaluation of 3D Input and Output Devices for the Suitability for Medical Applications <i>G. Faulkner, M. Krauss (D)</i>	1069

RADIOTHERAPY

Image-Guided Accurate Set-up of Patients in Radiotherapy <i>P. Vassal, N. Laieb, J. Troccaz, Y. Menguy, Ph. Cinquin, M. Bolla (F)</i>	1077
Optimisation Strategies in Hyperthermia Planning Compared with Those Used in Radiotherapy Planning <i>J. Gellermann, P. Wust, A. Wiener, D. Stalling, H. Stahl, R. Felix (D)</i>	1083
MR-Image-Guided Treatment Planning in Radiation Therapy <i>J. Schultze, D. Hebbinghaus, B. Kimmig (D)</i>	1088
Advanced Tools for 3D Radiotherapy Planning <i>R. Bendl, A. Hoess, W. Schlegel (D)</i>	1094
Electronic Portal Imaging System with Improved Performance for Set-up Verification and Dosimetry <i>H. Roehrig, Ch.W. Cheng, E.J. Gross, Th.C. Cetas, W.J. Dallas, T.Yu, H. Berger (USA)</i>	1100
3D Visualization of 3D-Calculated Treatment Plans in Cine-Mode <i>D. Hebbinghaus, P. Dennert, P. Kohr, G. Kovács, B. Kimmig (D)</i>	1109

COMPUTER ASSISTED SURGICAL MICROSCOPE

Stereo Overlays in the Operating Microscope for Image-Guided Surgery <i>P. Edwards, D.L.G. Hill, D.J. Hawkes, R. Spink (UK)</i>	1115
Multiple Co-Ordinate Manipulator (MKM) - A Computer-Assisted Microscope <i>J. Luber, A. Mackevics (D)</i>	1121
Applications of Virtual Reality in Stereotactic Surgery: Volumetric Image Navigation via the Surgical Microscope <i>R. Shahidi (USA)</i>	1127
Autostereoscopic 3D Display in Laparoscopic Surgery <i>N.A. Dodgson, N.E. Wiseman, S.R. Lang, D.C. Dunn, A.R.L. Travis (UK)</i>	1140

TRACKING AND GUIDANCE SYSTEMS

Application of the ARTMA Image-Guided Navigation System to Endonasal Sinus Surgery <i>A.R. Gunkel, W. Freysinger, W.F. Thumfart, M.J. Truppe (A)</i>	1146
A Vision-Based Intra-Operative Measurement System for the VISLAN Surgical Navigation System <i>P.T.E. Roberts, R.J. Evans, A.C.F. Colchester (UK)</i>	1152
MR-Guided Intravascular Catheters: in Vivo Evaluation <i>S. Wildermuth, J.F. Debatin, D.A. Leung, E. Hofmann, C.L. Dumoulin, G.C. McKinnon, W.D. Schopke, G.K. v. Schulthess (CH)</i>	1158

An Image Guide System for Medical Biopsy Using Thin-Slice CT Images <i>T. Tozaki, Y. Kawata, N. Niki, J. Ueno, H. Nishitani (J)</i>	1162
Real-Time Magnetic Resonance Imaging Techniques for Interventional MR <i>S.J. Riederer, J.P. Debbins, R.C. Grimm, P.J. Rossman (USA)</i> <i>see Appendix page</i>	1375
Computer-Aided Skull Base Surgery <i>St. Hassfeld, J. Zöller, C.R. Wirtz, F.K. Albert, M. Knauth, J. Mühling (D)</i>	1168
A 3D Energy Distributor for 3D Visualization <i>L. Desbat, P. Cinquin (F)</i>	1174
The OP 2000 Surgical User Environment <i>P.M. Schlag, G. Graszew, F. Engel-Murke, H. Hitzler, W. Maier-Borst, G. Müller (D)</i> <i>see Appendix page</i>	1380
MRI- and CT-Scopic Microsurgery and Drug Instillation for Outpatient Treatments <i>D. Grönmeyer, R. Seibel, A. Schmidt (D)</i> <i>see Appendix page</i>	1384
An Open MRI System Used for Interventional Procedures: Current Research and Initial Clinical Results <i>G.W. Lenz, C. Dewey (D)</i>	1180

REGISTRATION

A Unified Approach to 3D-2D Registration and 2D Images Segmentation <i>A. Hamadeh, P. Sautot, P. Cinquin (F)</i>	1191
The Accuracy of Image-Guided Neurosurgery Using Implantable Fiducial Markers <i>C.R. Maurer Jr., J.M. Fitzpatrick, R.L. Galloway Jr., M.Y. Wang, R.J. Maciunas, G.S. Allen (USA)</i>	1197
Reproducibility of 3D Reconstruction of Visceral and Subcutaneous Fat for Weight Loss Monitoring <i>J.G. Parravano, K.M. Wintch (USA)</i>	1203

MISCELLANEOUS

Next Generation Computer Architectures for Radiology <i>J. Flynn (USA)</i>	1209
New Possibilities for 3D Sonography - Transparent Presentation by Using Standard Transducers <i>R. Sader, H.-F. Zeilhofer, H. Deppe, H.-H. Horsch, B. Nuber, B. Hornung (D)</i>	1210
3D Reconstruction of Implanted Cardionverter-Defibrillator Electrodes Based on Ultrafast Computed Tomography Data for Localization of Anatomic Position <i>A. v. Smekal, S. Matke, A. Knez, K.C. Seelos, R. Haberl, M. Reiser (D)</i> <i>see Appendix page</i>	1403
Visualization and 3D Interaction for Hyperthermia Treatment Planning <i>D. Stalling, H.C. Hege, T. Höllerer (D)</i>	1216

Stereolithographic Skull Reconstructions for Preoperative Planning in Cranio-Maxillofacial Surgery

A. Lindner, M. Rasse, H-P. Wolf, W. Millesi, R. Eglmeier, I. Friede (A) 1223

Helical CT and Freeform Surfaces Geometric Design for the Prefabrication of Individual Cranial Prostheses

H. Eufinger, M. Wehmöller, A. Falk, T. Schneider, N.-C. Gellrich (D) 1229

Lower Limb Remnant Volumetry - Validation of Spiral CT and Optical Surface Scanning

K.E. Smith, P.K. Commean, G. Bhatia, M.W. Vannier (USA) 1235

Computer-Bsed Planning and Documentation of a Femoral Osteosynthesis

H.M. Overhoff, O.J. Grolle, P.C. Müller (D) 1241

POSTERSESSION

HISTORY

Early Days of Roentgen Photography in Japan

K. Inamoto, M. Matsumoto, K. Morikawa, T. Umeda (J) 1247

CAR

DIGITAL IMAGE GENERATION

Computer Tomography

Perfusion Analysis of the Brain Based on CT Angiography

J. Beier, R. Siekmann, E. Fleck, R. Felix (D) 1249

3D Image, MIP and MPR for Pulmonary Nodule

K. Suzuki, E. Kohda, M. Izutsu, N. Shiraga, K. Hiramatsu (J) 1250

Magnetic Resonance

Computer-Assisted Evaluation and Analysis of Dynamic MR Images of the Human Breast

I. Künzer, H. Sittek, M. Kessler, K.-H. Englmeier (D) 1252

Neuromagnetic Source Distribution Estimation Using MRI Information

N. Niki, K. Mino, N. Nakasato (J) 1253

Digital Radiography

Amplitude Quantization Requirements for Digital Imaging

M.E. Wolf (D) 1254

Stimluable Phosphors Through the Ages

M. Kruger (S) 1255

IMAGE PROCESSING AND DISPLAY

Evaluation of Improved 3D Imaging Method - Array and Allience Method <i>S. Murakami, Y. Morishita, T. Gomi, A. Kuwashima, Y. Hiramatu, S. Azemoto, N. Sato (J)</i>	1257
Multiresolution Segmentation Based on the Watershed Transformation <i>S. Wegner, T. Harms, J. Bultjes, H. Oswald, E. Fleck (D)</i>	1259
Automated Editing of CT Angiographic Data Sets <i>D. Hentschel, A. Bani-Hashemi, S. Duffy, C. Flanders, O. Kunert, C.C. Liang, D. Ney, A. Singh (USA)</i>	1260
The Lenticular System: a Full-Color Limited-Angle Autostereoscopic Alternative to Holography <i>F.W. Zonneveld, A.G.M. Huitema, A. Joel, M.A. Fernandez, P.F.G.M. van Waes, B. ter Haar Romeny (N)</i>	1261
Improved Visualization of Blood Vessels from MRA Data <i>K.J. Zuiderveld, M.A. Viergever (NL)</i>	1262
Quantitative Assessment of Coronary Lesion Severity: a Closer Look at the Discrepancy Between Visual Estimation and Computer-Assisted Measurement <i>W. Wunderlich, T. Linderer, F. Fischer, H.P. Schultheiss (D)</i>	1263
BMICS: A General Platform for Biomedical Image Analysis <i>Y. Bao, X. Ying (D)</i>	1328
The Artefacts of the Three Irreversible Compression Methods: JPEG, Fractal and Wavelet Compression <i>V. Karhula, J. Reponen, J. Laurila, J. Perälä, O. Tervonen, A. Koivula (SF)</i>	1264
Statistics-Based Segmentation of Multimodal Images <i>R. Vandenhousten, S. Wittkop, R. Grebe (D)</i>	1265
An Integrated Tool for Segmentation and Color Volume Rendering of Arbitrary 3D Modalities <i>R. Vandenhousten, R. Kottenhoff, R. Grebe (D)</i>	1266
An Efficient User Interface for Display and Analysis of Multi-Frame Digital Cineangiographic Data <i>K. Müller, E.L. LaPresto, K.A. Powell, J.L. Hirsch, J.F. Cornhill (USA)</i>	1268

MEDICAL WORKSTATION

Workstation for Computer-Assisted Diagnosis of Medical Images <i>V. Lashin, T. Belikova (RUS)</i>	1269
A High-Resolution Image Workstation for Vertebral Fracture Assessment <i>J. Rédei, S.M. Song, K. Engelke, X. Ouyang, J. Zhang, D. Burzota, V. Hargrave, M. Jergas, C.-C. Glüer, H.K. Genant (USA)</i>	1270

EXPERT SYSTEMS AND COMPUTER ASSISTED EDUCATION

X-Quiz: Computer-training Programme for X-Rays in Internal Medicine <i>Th. Baehring, I. Raue, K. Voigt, G. Borte (D)</i>	1271
Computer Assisted Education & Breast Cancer Diagnosis <i>P. Whatmough, A.G. Gale, A.R.M. Wilson (UK)</i>	1273
Knowledge Elicitation for Mammographic Expert Systems <i>M.D. Muggleston, A.G. Gale, A.R.M. Wilson (UK)</i>	1274
Intelligent Tutoring System Using the Library of Misconceptions and Digital Video Lecturing <i>R. Macura, K.J. Macura (USA)</i>	1275

COMPUTER ASSISTED DIAGNOSIS

Automatic Detection of Lung Nodules in Medical Images: Analysis in a Curvature Space <i>M.G. Penedo, M.J. Carreira, D. Cabello (E)</i>	1276
Fractal Analysis and Texture Feature for Classification of Ground-glass Shadow on High-resolution CT <i>K. Shimizu, T. Johkoh, K. Ichikado, J. Arisawa, J. Ikezoe, H. Nakamura, Y. Sato, H. Naito, S. Tamura (J)</i>	1278
Computerized Breast Ultrasound Reporting System Using the American College of Radiology Lexicon <i>G. Sisney (USA)</i>	1279

EuroPACS

CCT Diagnosis of Intracranial Haemorrhages: Monitor versus Film <i>R. Rechid, E. List-Hellwig, R. Leppek, J. Wagner, E. Walthers, G. Spalke, K.J. Klose (D)</i>	1280
A Multimedia Data Base Management System for MR Images of Traumatic Knee Lesions <i>G. Sparacia, A. Lo Casto, G. Mercurio, R. Lagalla (I)</i>	1281
Quality Preserved Image Data Coding in Cardangiography - How to Migrate from Cinefilm <i>M.R. Rombach, D. Saupe, U. Solzbach, U. Oser, H. Wollschläger, H. Just (D)</i>	1283
DICOM Implementation: Template Driven Multivendor Proprietary Format Translation <i>D.A. Clunie (SA)</i>	1284
A Practical DICOM 3.0 CD-ROM Jukebox Server <i>R.G.A. Langenhuyzen, W.H. (Pim) Philipse (NL)</i>	1286
The Freiburg Large-scale PAC System <i>E. Kotter, U. Schrader, E. Pelikan, U. Timmermann, R. Klar, M. Langer (D)</i>	1287

ISPRAD

Development and Evaluation of HIS, RIS, FCR and X-Ray Controller Integration

Y. Sukenobu, H. Kondoh, J. Ikezoe, H. Nakamura, Y. Mori, M. Sasagaki, K. Inamura, T. Kozuka (J) 1289

Diagnostic Imaging Plan: Manitoba 1995 - 2000

D.W. MacEwan et al. (CDN) 1290

TELERADIOLOGY

Teleradiology in Solitary Bone Lesions

M.D. Jiménez, J. Martel, J.L. Cárdenas, C. De Juan, J. Díaz, C. Alvarez, M.I. Fernández, J. Martín (E) 1291

Emergency Department Radiographs: ROC Study on Analogue and Digitized Images

J. Størmer, St.R. Bolle, T. Sund, G.E.R. Weller (N), J. Gitlin (USA) 1292

Multi-Modality Teleradiology Network and it's Image Quality Analysis by Simulated Nodules on Radiogram

M. Takizawa, S. Sone, J. Aoki, F. Sakai, K. Kiyono, Y. Imai, K. Yamashita, Y. Okazaki, Y. Fuwa(J) 1293

Teleservices in Medical Environments

A. Gehring (D) 1294

IMAGE GUIDED THERAPY (IGT)

Interactive 3-D Stereotactical Human Brain Data Base for Stereotactic Neurosurgery and Surgery Simulation

P.M. Pachatz (A) 1295

Virtual Reality in Medicine: A Functional Classification

S. Voelter, K.-L. Kraemer (D) 1297

Computer Assisted Maxillofacial Surgery

St. Fedtke, St. Hassfeld, J. Mühling, C.R. Wirtz, H. Sahl, K. Sartor (D) 1299

Minimally Invasive Resection of Brain Tumors by Stereotactic Laser Neurosurgery

N. Suhm, W. Schlegel, V. Sturm, J.F. Bille (D) 1300

Precise Measurement of the Head Position in Radiation Therapy

J. Amelung, B. Ristow (D) 1301

MR Anatomy Mapping with 4D Loreta for Assessment and Localization of Neurological Function

L. Bidaut, R. Pascual-Marqui, C. Michel, T. Landis, D. Rüfenacht (CH) 1302

Interventional Video Tomography

M. Truppe, F. Pongracz, W. Freysinger, A. Gunkel, W. Thumfart (A) 1303

Treatment Planning of Craniofacial Deformities with Asymmetrie using Solid Models (Stereolithography, Milling) from 3D CT Datas <i>H.-F. Zeilhofer, R. Sader, H. Deppe, H.-H. Horch (D)</i>	1329
Preoperative Planning of Surgical Corrections in Cleft Patients by 3D-Evaluation of the Velopharyngeal Function <i>R. Sader, H.-H. Horch, H.-F. Zeilhofer, H. Deppe, Ch. Hannig, U. Hess (D)</i>	1304
Description and Assessment of Stereotactic Procedures with Digital X-Ray Angiography <i>E. Maurincomme, L. Launay, C. Picard, R. Anxionnat, L. Picard, M. Södermann (F)</i>	1305
Craniofacial Anatomy of Treacher Collins Syndrome Studied by 3D CT-Scans and Stereolithographies <i>S. Kreiborg, P. Larsen, E. Dahl, H. Pedersen (DK)</i>	1307
A Treatment Planning System for Intratumoral Chemotherapy <i>R. Müller, W.J. Zeller, W. Schlegel (D)</i>	1308
Individual Anatomical Models and a New Way of their Application in Intraoperative Guidance <i>U.G. Kliegis, R. Ascherl, H.-F. Zeilhofer (D), H. Kaercher (A)</i>	1309
Marching Cubes: On the Theoretical Foundation, and an Efficient Implementation <i>M. Liversage (DK)</i>	1310
An Affordable System for 3D Stereo-Visualization of Tomographic Data <i>T. Darvann, P. Larsen, S. Kreiborg, S.-E. Madsen, S. Brockmann (DK)</i>	1311
Realtime Volume Visualization of 3D-MRI Data for Applications in Diagnostics and Computer Aided Surgery <i>M. Hübner, U.G. Kühnapfel (D)</i>	1312

COMPUTER ASSISTED SURGERY - CAS

Development of a Three-Dimensional Image Processing System and Application to Therapy Planning Support <i>M. Oikawa, K. Sano, Y. Isobe, M. Asato (J)</i>	1313
The Solid Imaging of Intraventricular Structure Using the Computer Graphics <i>J. Wada, H. Ito, O. Utsugi (J)</i>	1314
3D Reconstructions of 2-D CT in 106 Patients Attending an Italian Hospital <i>S. Taggi, F.M. Tovazzi, S. Villa, R. Sforza (I)</i>	1315
Importance of the Active Positioning for the Accurate Facial Contourmetry with Laser Light Scanner <i>M. Kosaka, H. Kamiishi (J)</i>	1317
Application of Stereographic Processing of CT Figures to Fracture-dislocation of the hip <i>M. Tomihara, K. Fukuda, S. Tanaka (J)</i>	1319

COMPUTED MAXILLOFACIAL IMAGING (CMI)

Computer Assisted Digital Magnification Radiography for Animal Experimental Field <i>K. Nakamura, K. Nishimura, I. Kashima (J)</i>	1320
Mathematical Morphology for Bone Trabeculae Analysis <i>S. Kumasaka, I. Kashima (J)</i>	1321
Development of Multiple Function Phantom for MR Imaging Using Surface Coils <i>T. Sakurai, M. Ishii, I. Kashima (J)</i>	1322
Visualisation of Discal Structures of the TMJ in MR Imaging: Strategy of the Examination Procedure <i>A. Hugger, B. Korda, J. Assheuer, U. Stüttgen (D)</i>	1323
Kentucky Pediatric Teledentistry Network <i>A.G. Farman, W.C. Scarfe, N.L. Hunter (USA)</i>	1324
Thin Section CT, 3D Reconstruction, and MRI in the Evaluation of Craniofacial Anomalies <i>U.O. Aideyan, E.A. Brandser, B.K. Han (USA)</i>	1325
Use of 2D Filtering for a Simulated Contrast Enhanced CT - Detection of Defects in Peripheral Rim Border <i>M. Wakoh, H. Kitagawa, T. Harada, K. Kuroyanagi (J)</i>	1326
A Comprehensive Computer Aided Diagnostic System to Analyse Maxillofacial Discrepancies <i>J. Parthasarathy (IND)</i>	1327
CCD-Intraoral Imaging and Pixel Values of Composite Restorative Materials <i>T. Goshima, A.G. Farman, W.C. Scarfe, Y. Goshima</i>	1330

APPENDIX

A Customer-Focused Approach to Digital Information Management - the Connectivity Program <i>A. Freybott (Invited Speaker) (D)</i>	1333
On-Demand Conversion of Proprietary Image Formats to DICOM 3.0 <i>D.P. Reddy, M.E. Noz, G.O. Maguire, D. Garza, S. Horowitz (USA)</i>	1339
TELECONSULTATION A Neurosurgical Image Transfer System for the Daily Routine and in Emergency cases. A 4 Year Study <i>V. Urban, Ch. Busert, N. Huewel, A. Pernecky (D)</i>	1346
Computer-Aided Individual Transplant Design for Reconstruction of the Mandible <i>H.-F. Zeilhofer, R. Sader, R. Kirsten, M. Lenz (D)</i>	1353
Maxillofacial Asymmetry Related to the Occlusal Plane? - CAS with Laser Technology Models <i>H. Schiel, B. Hammer, A. Jacob, J. Th. Lambrecht (CH)</i>	1359

CAR - CAD/CAM - CAS: 3D Perspectives*J.Th. Lambrecht, H. Schiel, A.L. Jacob, Th. Kreusch (CH)*..... 1364**Preoperative Visualization of Aesthetic Changes in Orthognatic Surgery***H.-F. Zeilhofer, R. Sader, H.-H. Horsch, H. Deppe (D)* 1369**Real-Time Magnetic Resonance Imaging Techniques for Interventional MR***S.J. Riederer, J.P. Debbins, R.C. Grimm, P.J. Rossman (USA)* 1375**The OP 2000 Surgical User Environment***P.M. Schlag, G. Graschew, F. Engel-Murke, H. Hitzler, W. Maier-Borst, G. Müller (D)* 1380**MRI- and CT-Scopic Microsurgery and Drug Instillation for Outpatient Treatments***D. Grönemeyer, R. Seibel, A. Schmidt (D)* 1384**Dynamic 3D Reconstruction of the Left-Ventricular Endocardium: an MRI-Data-Based Approach Using a Neural Network***A. von Smekal, K.C. Seelos, J. Lange, M. Reiser (D)* 1393**Open Image Management with DICOM, a Phased Approach***J.P. Neumann, Ch.R. Parisot, B. Klipfel, M.S. Beaver, T. Sippel (F)* 1396**Status of Hastings PACS: Development, Reconfiguration and Design of Hardware Modifications, RIS Integration and DICOM Migration in Functional Segments***N.J. Tomlinson, K.D. Foord (UK)* 1401**3D Reconstruction of Implanted Cardionverter-Defibrillator Electrodes Based on Ultrafast Computed Tomography Data for Localization of Anatomic Position***A. v. Smekal, S. Matke, A. Knez, K.C. Seelos, R. Haberl, M. Reiser (D)* 1403**Colour Figures**..... 1405**Glossary**..... 1431**List of Authors** 1437