Contents

Organizers V
Program Committee VI
Preface IX

PART I - Invited lectures I-1

NEW RESULTS OBTAINED USING THE MEDICAL IMAGES AUTOMATIC UNDERSTANDING TECHNOLOGIES I-3
Ryszard TADEUSIEWICZ, Marek R. OGIELA

TIME-FREQUENCY AND TOPOGRAPHICAL ANALYSIS OF SIGNALS I-16
Katarzyna J. BLINOWSKA

TELEMEDICINE AND eHEALTH I-23
Wojciech GLINKOWSKI

THE BIOMEDICAL IMAGES CONGRUENCING AND THE 3-D OBJECT RECONSTRUCTION I-30
Andrzej NAPIERALSKI, Małgorzata NAPIERALSKA, Mariusz ZUBERT

NEAR INFRARED SPEKTROSCOPY IN STUDY OF BRAIN OXYGENATION I-41
Adam LIEBERT, Roman MANIEWSKI

PART II - Image processing & CAD 1

APPLICATION OF MORPHOLOGICAL SPECTRA TO COMPUTER-AIDED ANALYSIS OF TEXTURES 3
Juliusz Lech KULIKOWSKI, Małgorzata PRZYTULSKA, Diana WIERZBICKA

REMARKS ON QUANTITATIVE ANALYSIS OF MEDICAL RADIOLOGY IMAGES 9
Maria BERNDT-SCHREIBER, Tomasz KAZIMIERCZAK

ACUTE ISCHEMIC STROKE: ENHANCED DISPLAY OF HYPODENSE CHANGES IN CT EXAMS 13
Artur PRZELASKOWSKI, Paweł BARGIEŁ, Katarzyna SKLINDA, Jerzy WALECKI

KERNELIZED FUZZY C-MEANS METHOD IN SEGMENTATION OF DEMYELINATION PLAQUES IN MULTIPLE SCLEROSIS 20
Jacek KAWA, Ewa PIETKA

CABRS – CELLULAR AUTOMATON BASED MRI BRAIN SEGMENTATION 28
Rafał Henryk KARTASZYŃSKI, Paweł MIKOŁAJCZAK

VALIDITY OF MRI BRAIN PERFUSION IMAGING METHOD 35
Bartosz KARCZEWSKI, Jacek RUMIŃSKI

THE PROPOSED SYSTEM FOR ORTHODONTIC SURGERY 41
Przemysław KOWALSKI

THE DEVELOPMENT OF METHODS FOR QUANTITATIVE CLINICAL ASSESSMENT OF THE FRACTURE HEALING 46
Wojciech GLINKOWSKI, Jarosław ŻYŁKOWSKI, Artur WOJCIECHOWSKI, Andrzej GÓRECKI

THE HOUGH TRANSFORM AND ACTIVE CONTOURS IN SEGMENTATION OF CYTOLOGICAL IMAGES 62
Maciej HREBIEŃ, Piotr STEĆ

3D VISUALIZATION OF SEGMENTED CRUCIATE LIGAMENTS 69
Paweł BADURA

AUTOMATIC REGISTRATION AND MERGING OF 3D SURFACE SCANS OF HUMAN HEAD 75
Agnieszka TOMAKA, Krzysztof SKABEK

APPLICATIONS OF IMAGE REGISTRATION IN PARAMETRIC IMAGING 82
Jacek RUMIŃSKI , Marek SUCHOWIRSKI

IRIS FINDER – PROGRAM FOR RELIABLE IRIS LOCALIZATION IN IMAGES TAKEN UNDER VISIBLE LIGHT 88
Wojciech SANKOWSKI, Kamil GRABOWSKI, Mariusz ZUBERT, Małgorzata NAPIERALSKA

REPRESENTATION OF SYMPTOMS AND EVIDENCE IN DIAGNOSIS SUPPORT 96
Ewa STRASZECKA

HYBRID FUZZY CLUSTERING METHOD 102
Tomasz PRZYBYŁA

PART III - Signal processing 109

LOCALIZATION OF ELECTRICAL ACTIVITY IN THE BRAIN 111
Zbigniew DUNAJSKI, Tadeusz PAŁKO

TRANSMISSION OF INFORMATION DURING CONTINUOUS ATTENTION TEST 115
Rafał KUŚ, Katarzyna J. BLINOWSKA, Anna BASIŃSKA–STARZYCKA

INTELLIGENT FEATURE EXTRACTION IN FETAL HEART RATE SIGNAL 121
Paweł ŁABAJ, Janusz JEŻEWSKI, Ryszard WINIARCZYK, Michał JEŻEWSKI, Janusz WRÓBEL, Adam GACEK

APPLICATION OF NEURAL NETWORKS FOR PREDICTION OF FETAL OUTCOME 127
Michał JEŻEWSKI, Norbert HENZEL, Janusz WRÓBEL, Paweł ŁABAJ, Krzysztof HOROBA, Adam MATONIA

AN APPLICATION OF ROBUST FILTERS IN ECG SIGNAL PROCESSING 133
Tomasz PANDER

PARAMETERS ESTIMATION FOR DIGITAL NON-LINEAR FITLERS USING NEURO-FUZZY SYSTEM 139
Robert CZABAŃSKI, Tomasz PANDER

EVALUATION OF ELECTRICAL CARDIAC MEMORY INDUCTION DURING NON-INVASIVE CORONARY STIMULATION TEST 145
Fryderyk PROCHACZEK, Izabela KOWALSKA, Arkadiusz ORZEŁ, Aleksander OWCZAREK, Jerzy GAŁECKA

ANALYSIS OF THE AGREEMENT OF CAVASCREEN SYSTEM DIAGNOSTIC SUGGESTIONS WITH THE REAL CLINICAL STATE OF A PATIENT 151
Aleksander SOBOTNICKI, Paweł GIBIŃSKI, Sebastian HEIN, Adam GACEK, Liana PUCHALSKA, Georgij BIEŁKANIA, Tadeusz PAŁKO, Ewa PIĄTKOWSKA-JANKO

THE 6 - MINUTES WALK TEST ON THE TREADMILL CONTROLLED BY A PATIENT'S WALK 157
Zbigniew SZCZUREK, Fryderyk PROCHACZEK, Jacek BRANDT, Paweł KOWALSKI, Katarzyna ŚWIDA, Adam CURYŁO, Andrzej MICHNIK

OPTIMAL LEADS SELECTION FOR ISCHEMIA DIAGNOSIS 163
Michał KANIA, Małgorzata FERENIEC, Roman MANIEWSKI

APPLICATION OF DYNAMIC TIME WARPING TO ECG PROCESSING 169
Marian KOTAS

EMPIRICAL BAYESIAN AVERAGING OF BIOMEDICAL SIGNALS 176
Alina MOMOT, Michał MOMOT, Jacek ŁĘSKI

BAYESIAN APPROACH TO CLASSIFIER DESIGN WITH APPLICATION TO QRS DETECTION IN ECG SIGNAL 182
Michał MOMOT, Alina MOMOT

ANALYSIS OF OTOACOUSTIC EMISSIONS BY MEANS OF ADAPTIVE APPROXIMATIONS 187
W. Wiktor JĘDRZEJCZAK , Katarzyna J. BLINOWSKA, Wiesław KONOPKA

MODEL OF THE OCULOMOTORIC SYSTEM FOR DIAGNOSIS OF SQUINT 193
Dariusz POJDA, Józef OBER

ANALYSIS OF UTERINE CONTRACTION ACTIVITY USING TWO WAYS OF SIGNAL ACQUISITION 199
Krzysztof HOROBA, Adam MATONIA, Janusz JEZEWSKI, Tomasz KUPKA, Adam GACEK

USER VOICE IDENTIFICATION IN COMPUTER APPLICATIONS 205
Piotr PORWIK

COMPUTERISED SYSTEM FOR OXYGENATION MONITORING IN NEWBORN INFANTS 212
Janusz WROBEL, Janusz JEZEWSKI, Tomasz KUPKA, Michal JEZEWSKI, Adam GACEK

ANALYSIS OF THE TEAR FILM KINETICS BY NUMERICAL FILTERING OF INTERFEROGRAMS 218
Dorota H. SZCZĘSNA, Henryk T. KASPRZAK

PART IV - Telemedicine 223

INTEGRATED HOSPITAL INFORMATION SYSTEM – IMPLEMENTATION IN HOLYCROSS ONCOLOGICAL CENTRE – CASE STUDY 225
Stanisław GÓŹDŹ, Wojciech CEDRO, Ryszard MĘŻYK

TELEMEDICAL PORTAL ‘TELEMEDYCYNA WIELKOPOLSKA’ 230
Jurek BŁASZCZYŃSKI, Michał KOSIEDOWSKI, Cezary MAZUREK, Roman SŁOWIŃSKI, Krzysztof SŁOWIŃSKI, Maciej STROIŃSKI, Szymon WILK

TELEMEDICINE FRAMEWORK FOR FOLLOW-UP HIGH RISK PERGNANCY 236
Dominik BOŻEWICZ, Tadeusz PAŁKO, Michał JEŻEWSKI, Paweł ŁABAJ, Tomasz KUPKA, Marek BERNYŚ

SCREENING TELEDIAGNOSTICS OF SPINAL DEFORMITIES BASED ON OPTICAL 3D SHAPE MEASUREMENT SYSTEM AND AUTOMATED DATA ANALYSIS – PRELIMINARY REPORT 241
Robert SITNIK, Wojciech GLINKOWSKI, Magdalena LICAU, Wojciech ZAŁUSKI, Dorota KOZIOŁ, Bożena GLINKOWSKA, Andrzej GÓRECKI

THE USE OF MULTI-MEDIA MESSAGING AS SUPPLEMENT INFORMATION OF MUSCULOSKELETAL INJURY CASES 246
Artur WOJCIECHOWSKI, Wojciech GLINKOWSKI, Marek GOŁĘBIOWSKI, Andrzej GÓRECKI

MEDICAL INTERACTIVE TELEEDUCATION VIA INTERNET BASED VIDEOCONFERENCING 254
Wojciech GLINKOWSKI, Konrad MĄKOSA, Szymon PAWLICA, Krzysztof MARASEK, Andrzej GÓRECKI

PART V - Handwriting recognition 259

SCANPATH ANALYSIS IN OBJECTIVE EVALUATION OF READING SKILLS 261
Piotr AUGUSTYNIAK

APPLICATION OF DOCUMENT TYPE IDENTIFICATION IN MEDICAL HANDWRITTEN TEXTS RECOGNITION 267
Jerzy SAS, Jerzy PEJCZ

A MULTI-LEVEL ARCHITECTURE FOR RECOGNITION OF POLISH HANDWRITTEN MEDICAL TEXTS 273
Jerzy SAS, Maciej PIASECKI

CORPUS OF MEDICAL TEXTS AND TOOLS 281
Grzegorz GODLEWSKI, Maciej PIASECKI, Jerzy PEJCZ

PART VI - Biomaterials 287

EVALUATION OF SURFACE DAMAGE OF PLATES USED IN FUNNEL CHEST TREATMENT 289
Anita KRAUZE, Wojciech KAJZER, Józef DZIELICKI, Jan MARCINIAK

SURFACE TREATMENT OF STAINLESS STEEL INTENDED FOR UROLOGICAL STENTS 296
Wojciech KAJZER, Anita KRAUZE, Jan MARCINIAK

PART VII - Various applications 303

SEGMENTATION OF LATERAL VENTRICLES FOR MONITORING OF PATIENT'S STATUS WITH NORMAL PRESSURE HYDROCEPHALUS 305
Arkadiusz GERTYCH, Alexis WONG

THEORY OF FUZZY SETS IN EDGE LOCATION OF THE POSTERIOR CRUCIATE LIGAMENT REGION 312
Piotr ZARYCHTA, Ewa PIĘTKA, Aleksandra KIEŁTYKA, Anna ZARYCHTA-BARGIEŁA

FUZZY 3D EXTENSION OF THE LIVE-WIRE APPROACH TO MEDICAL IMAGE SEGMENTATION 318
Wojciech WIĘCŁAWEK, Ewa PIĘTKA

THE USAGE OF TEMPLATE MATCHING AND MULTIRESOLUTION FOR DETECTING CANCEROUS MASSES IN MAMMOGRAMS 324
Marcin BATOR, Mariusz NIENIEWSKI

3D MODEL OF THE LUNGS 330
Dominik SPINCZYK, Ewa PIETKA

EDUCATIONAL ON-LINE ATLAS OF IMAGES OF RESPIRATORY SYSTEM 336
Aleksandra ZAGŁÓWEK, Arkadiusz GERTYCH, Grzegorz KACZMARCZYK, Dominik SPIŃCZYK

MODEL OF HUMAN SYSTEM OF GLUCOSE LEVEL STABILISATION – SELECTED PROBLEMS OF PARAMETER IDENTIFICATION 342
Blanka KORONA, Jerzy BRANDYS, Sebastian POLAK

ON A NEW METHOD OF COMBINING CLASSIFIERS APPLIED TO THE PROTEIN SECONDARY STRUCTURE PREDICTION 348
Tomasz WOŁOSZYŃSKI, Marek KURZYŃSKI

INCOMPETE DATA IN FUZZY INFERENCE SYSTEM 354
Sylwia POŚPIECH-KURKOWSKA

A NEW CLASS OF DIGITAL FILTERS DESSIGNED FOR ECG NOISE REDUCTION 360
Norbert HENZEL

TIME-GATED INTENSIFIED CCD CAMERA FOR IMAGING OF AN OPTICALLY TURBID MEDIUM – PRELIMINARY EXPERIMENTS 366
Piotr SAWOSZ, Adam LIEBERT, Roman MANIEWSKI

PART VIII - Face analysis 371

SEGMENTING 3D MESH IMAGES OF THE HUMAN FACE BY LOCAL QUADRIC PARAMETRIZATION 373
Leszek LUCHOWSKI

COMPUTER SYSTEM FOR THE ANALYSIS OF FACIAL FEATURES BASED ON 3D SURFACE SCANS 377
Agnieszka SORNEK, Agnieszka TOMAKA

SYSTEM FOR FACIAL TISSUE RECONSTRUCTION BASED ON DOWEL METHOD 383
Karolina WIĘCKOWSKA, Agnieszka TOMAKA, Ryszard WINIARCZYK

FACE RECONSTRUCTION. SELECTION OF VERTICES ACCORDING TO CYLINDRICAL PROJECTION. FAST DEFORMATION METHOD 389
Rafał STEGIERSKI, Paweł MIKOLAJCZAK

APPLICATION OF COLOR INFORMATION IN HUMAN FACE RECOGNITION 395
Michal KAWULOK, Bogdan SMOLKA

PART IX - Medical Imaging Applications 401

EDGE-PRESERVING REGULARIZATION FOR CONFOCAL DATA DECONVOLUTION 403
Marek ZIMÁNYI, Anton MATEÁŠIK and Miloš ŠRÁMEK

SPECT/CT – A NEW ERA IN MEDICAL IMAGING 411
Scott BERG, Ponraj CHINNADURA, Britt-Isabelle BÖRNER, Jan MÜLLER-BRAND, Georg BONGARTZ

FIRST ATTEMPTS FOR SEMIAUTOMATIC 3D-VISUALIZATION OF THE OPTIC NERVE 417
Cornelia KOBER, Britt-Isabelle BÖRNER, Carlos Buitrago TELLÉZ, Klaus SCHEFFLER, Ernst Wilhelm RADÜ, Hans-Florian ZEILHOFER

GENERAL PROJECT'S SETUP FOR FINITE ELEMENT SIMULATION OF BONY ORGANS DEMOSTRATED FOR THE CASE OF A HUMAN MANDIBLE 421
Cornelia KOBER, Christian HELLMICH, Stefan STÜBINGER, Robert SADER, Hans-Florian ZEILHOFER

COMPUTER-AIDED SURGERY PLANNING AND INTRAOPERATIVE NAVIGATION FOR COMPLEX MAXILLOFACIAL RECONSTRUCTION AFTER JUVENILE SOFT TISSUE TUMOR RESECTION 427
Zdzisław KRÓL, Jonas CHAPUIS, Cornelia KOBER, Frank LANGLOTZ, Hans-Florian ZEILHOFER, Katja SCHWENZER-ZIMMERER

Author index 433