

# Contents

## Part I: General Problems of H-CSI

|                                                                                                                                |           |
|--------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>From Research on the Decision-Making in Ill-Structured Situation Control and the Problem of Risks .....</b>                 | <b>3</b>  |
| <i>N.A. Abramova, S.V. Kovriga</i>                                                                                             |           |
| <b>Emulating the Perceptual System of the Brain for the Purpose of Sensor Fusion .....</b>                                     | <b>17</b> |
| <i>R. Velik, D. Bruckner, R. Lang, T. Deutsch</i>                                                                              |           |
| <b>Knowledge Acquisition in Conceptual Ontological Artificial Intelligence System .....</b>                                    | <b>29</b> |
| <i>M. Krótkiewicz, K. Wojtkiewicz</i>                                                                                          |           |
| <b>Problems of Knowledge Representation in Computer-Assisted Decision Making Systems .....</b>                                 | <b>39</b> |
| <i>J.L. Kulikowski</i>                                                                                                         |           |
| <b>A Dialogue-Based Interaction System for Human-Computer Interfaces .....</b>                                                 | <b>55</b> |
| <i>G. Bel-Enguir, A.H. Dediu, M.D. Jiménez-López</i>                                                                           |           |
| <b>Consistency-Based vs. Similarity-Based Prediction Using Extensions of Information Systems – An Experimental Study .....</b> | <b>67</b> |
| <i>K. Pancarz</i>                                                                                                              |           |
| <b>Image Annotation Based on Semantic Rules .....</b>                                                                          | <b>83</b> |
| <i>A.L. Ion</i>                                                                                                                |           |

## Part II: Disabled Persons Helping and Medical H-CSI Applications

|                                                                                                                                 |     |
|---------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>A Prototype Mobility and Navigation Tele-Assistance System for Visually Disabled</b> .....                                   | 97  |
| <i>M. Bujacz, P. Barański, M. Morański, P. Strumillo, A. Materka</i>                                                            |     |
| <b>Eye-Mouse for Disabled</b> .....                                                                                             | 109 |
| <i>T. Kocejko, A. Bujnowski, J. Wtorek</i>                                                                                      |     |
| <b>Eye-Blink Controlled Human-Computer Interface for the Disabled</b> .....                                                     | 123 |
| <i>A. Królak, P. Strumillo</i>                                                                                                  |     |
| <b>HMM-Based System for Recognizing Gestures in Image Sequences and Its Application in Continuous Gesture Recognition</b> ..... | 135 |
| <i>A. Wilkowski</i>                                                                                                             |     |
| <b>Machine Learning of Melanocytic Skin Lesion Images</b> .....                                                                 | 147 |
| <i>G. Surówka</i>                                                                                                               |     |
| <b>A Preliminary Attempt to Validation of Glasgow Outcome Scale for Describing Severe Brain Damages</b> .....                   | 161 |
| <i>J.W. Grzymala-Busse, Z.S. Hippe, T. Mroczek, W. Paja, A. Bucinski</i>                                                        |     |
| <b>Segmentation of Anatomical Structure by Using a Local Classifier Derived from Neighborhood Information</b> .....             | 171 |
| <i>S. Takemoto, H. Yokota, T. Mishima, R. Himeno</i>                                                                            |     |
| <b>An Application of Detection Function for the Eye Blinking Detection</b> .....                                                | 181 |
| <i>T. Pander, T. Przybyła, R. Czabański</i>                                                                                     |     |
| <b>Self-directed Training in an Evidence-Based Medicine Experiment</b> .....                                                    | 193 |
| <i>M.M. Marta, S.D. Bolboacă, L. Jäntschi</i>                                                                                   |     |

## Part III: Psychological and Linguistic Aspects of H-CSI

|                                                                               |     |
|-------------------------------------------------------------------------------|-----|
| <b>Emotion Recognition from Facial Expression Using Neural Networks</b> ..... | 207 |
| <i>G.U. Kharat, S.V. Dudul</i>                                                |     |

|                                                                                                    |     |
|----------------------------------------------------------------------------------------------------|-----|
| <b>Emotion Eliciting and Decision Making by Psychodynamic Appraisal Mechanism</b> .....            | 221 |
| <i>J. Liu, H. Ando</i>                                                                             |     |
| <b>Positing a Growth-Centric Approach in Empathic Ambient Human-System Interaction</b> .....       | 233 |
| <i>R. Legaspi, K. Fukui, K. Moriyama, S. Kurihara, M. Numao</i>                                    |     |
| <b>Toward Daydreaming Machines</b> .....                                                           | 245 |
| <i>S.I. Ahson, A. Buller</i>                                                                       |     |
| <b>Eliminate People's Expressive Preference in the Mood of Fuzzy Linguistics</b> .....             | 257 |
| <i>Z. Qin, Q.C. Shang</i>                                                                          |     |
| <b>VoiceXML Platform for Minority Languages</b> .....                                              | 269 |
| <i>M. Brkić, M. Matetić, B. Kovačić</i>                                                            |     |
| <b>Polish Speech Processing Expert System Incorporated into the EDA Tool</b> .....                 | 281 |
| <i>A. Pułka, P. Kłosowski</i>                                                                      |     |
| <b>A Web-Oriented Java3D Talking Head</b> .....                                                    | 295 |
| <i>O. Gambino, A. Augello, A. Caronia, G. Pilato, R. Pirrone, S. Gaglio</i>                        |     |
| <b>A VR-Based Visualization Framework for Effective Information Perception and Cognition</b> ..... | 313 |
| <i>H.Y.K. Lau, L.K.Y. Chan, R.H.K. Wong</i>                                                        |     |
| <br><b>Part IV: Robots and Training Systems</b>                                                    |     |
| <b>From Research on the Virtual Reality Installation</b> .....                                     | 335 |
| <i>F. de Sorbier de Pougnaudresse, P. Bouvier, A. Herubel, V. Biri</i>                             |     |
| <b>High-Level Hierarchical Semantic Processing Framework for Smart Sensor Networks</b> .....       | 347 |
| <i>D. Bruckner, C. Picus, R. Velik, W. Herzner, G. Zucker</i>                                      |     |
| <b>A Human-System Interaction Framework and Algorithm for UbiComp-Based Smart Home</b> .....       | 359 |
| <i>C.L. Wu, L.C. Fu</i>                                                                            |     |
| <b>Biologically Reasoned Point-of-Interest Image Compression for Mobile Robots</b> .....           | 371 |
| <i>M. Podpora, J. Sadecki</i>                                                                      |     |

|                                                                                                                       |            |
|-----------------------------------------------------------------------------------------------------------------------|------------|
| <b>Surgical Training System with a Novel Approach to Human-Computer Interaction .....</b>                             | <b>383</b> |
| <i>A. Wytyczak-Partyka, J. Nikodem, R. Klempous, J. Rozenblit</i>                                                     |            |
| <b>Kinematics Analysis and Design of 3 DOF Medical Parallel Robots .....</b>                                          | <b>395</b> |
| <i>S.D. Stan, M. Manic, V. Maties, R. Balan, D. Verdes</i>                                                            |            |
| <b>Graphical Human-Machine Interface for QB Systems .....</b>                                                         | <b>407</b> |
| <i>M. Jasiński, A. Nawrat</i>                                                                                         |            |
| <b>Visualization of Two Parameters in a Three-Dimensional Environment .....</b>                                       | <b>419</b> |
| <i>L. Deligiannidis, A. Sheth</i>                                                                                     |            |
| <br><b>Part V: Various H-CSI Applications</b>                                                                         |            |
| <b>An Evaluation Tool for End-User Computing Competency in an Organizational Computing Environment .....</b>          | <b>431</b> |
| <i>C.Y. Yoon, J.N. Jeon, S.K. Hong</i>                                                                                |            |
| <b>Enterprise Ontology for Knowledge-Based System .....</b>                                                           | <b>443</b> |
| <i>J. Andreasik</i>                                                                                                   |            |
| <b>Constructing Ensemble-Based Classifiers Based on Feature Transformation: Application in Hand Recognition .....</b> | <b>459</b> |
| <i>H. Mirzaei, M. Jafarzadegan</i>                                                                                    |            |
| <b>A New and Improved Skin Detection Method Using Mixed Color Space .....</b>                                         | <b>471</b> |
| <i>M.M. Aznaveh, H. Mirzaei, E. Roshan, M.H. Saraei</i>                                                               |            |
| <b>A Formal Model for Supporting the Adaptive Access to Virtual Museums .....</b>                                     | <b>481</b> |
| <i>A. Dattolo, F.L. Luccio</i>                                                                                        |            |
| <b>3D Molecular Interactive Modeling .....</b>                                                                        | <b>493</b> |
| <i>M. Essabbah, S. Otmane, M. Mallem</i>                                                                              |            |
| <b>Shape Recognition of Film Sequence with Application of Sobel Filter and Backpropagation Neural Network.....</b>    | <b>505</b> |
| <i>A. Głowacz, W. Głowacz</i>                                                                                         |            |
| <b>Dynamic Changes of Population Size in Training of Artificial Neural Networks .....</b>                             | <b>517</b> |
| <i>A. Słowik, M. Białko</i>                                                                                           |            |

|                                                                                                                               |            |
|-------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>New Approach to Diagnostics of DC Machines by Sound<br/>Recognition Using Linear Predictive Coding .....</b>               | <b>529</b> |
| <i>A. Głowacz, W. Głowacz</i>                                                                                                 |            |
| <b>Diagnosis Based on Fuzzy IF-THEN Rules and Genetic<br/>Algorithms .....</b>                                                | <b>541</b> |
| <i>A. Rotshtein, H. Rakytyanska</i>                                                                                           |            |
| <b>Necessary Optimality Conditions for Fractional<br/>Bio-economic Systems: The Problem of Optimal Harvest<br/>Rate .....</b> | <b>557</b> |
| <i>D.V. Filatova, M. Grzywaczewski</i>                                                                                        |            |
| <b>Author Index .....</b>                                                                                                     | <b>569</b> |