19th International Conference
Artificial Intelligence and Soft Computing

Program

all times are in Warsaw (Warszawa), Poland, CEST — Central European Summer Time
https://www.timeanddate.com/time/zone/poland/warsaw

Zakopane (online), Poland, October 12-14, 2020

Program at a glance

Monday, October 12		Tuesday, October 13		Wednesday, October 14	
8:30 - 8:40 **Opening Ceremony** **Invited Talks, Chair: Leszek Rutkowski**					
8:40 - 9:25		**9:00 - 10:15**		**9:00 - 10:15**	
Wlodzislaw Duch	Neurocognitive Technologies and Computational Intelligence for Human Augmentation	Session 3A: Neural Networks and Their Applications 3	Session 3B: Bioinformatics, Biometrics and Medical Applications	Session 7A: Data Mining 2	Session 7B: Various Problems of Artificial Intelligence 1
9:25 - 10:10					
Tom Gedeon	Predicting human internal states from physiological signals				
10:30 - 11:45		**10:30-11:45**		**10:30-11:45**	
Session 1A: Neural Networks and Their Applications 1	Session 1B: Pattern Classification 1	Session 4A: Neural Networks and Their Applications 4	Session 4B: Artificial Intelligence in Modeling and Simulation	Session 8A: Evolutionary Algorithms and their Applications 1	Session 8B: Various Problems of Artificial Intelligence 2
12:00 - 13:15		**12:00 - 13:15**		**12:00 - 13:15**	
Session 2A: Neural Networks and Their Applications 2	Session 2B: Pattern Classification 2	Session 5A: Neural Networks and Their Applications 5	Session 5B: Computer Vision, Image and Speech Analysis 1	Session 9A: Evolutionary Algorithms and their Applications 2	Session 9B: Various Problems of Artificial Intelligence 3
13:00 - 14:30		**13:00 - 14:30**		**13:00 - 14:30**	
Break		Break		Break	
Invited Talk, Chair: **14:30 - 15:15**		**14:30 - 15:45**		**14:30 - 15:45**	
Jarek Gryz	Algorithms and Politics	Session 6A: Data Mining 1	Session 6B: Computer Vision, Image and Speech Analysis 2	Session 10A: Agent Systems, Robotics and Control	Session 10B: Various Problems of Artificial Intelligence 4
Invited Talks **15:20 - 16:05**					
Bartosz Krawczyk	Learning from imbalanced and difficult data				

Detailed Program

Monday, June 12

07:30 - 8:30

Breakfast, Room: Zakopane (by Zoom)

8:30 - 8:40

Opening Ceremony, Room: Tatry (by Zoom)

Invited Talks, Chair: Leszek Rutkowski, Room: Tatry (by Zoom)

8:40 - 9:25

Wlodzislaw Duch – "Neurocognitive Technologies and Computational Intelligence for Human Augmentation"

9:25 - 10:10

Tom Gedeon – "Predicting human internal states from physiological signals"

Session 1A: Neural Networks and Their Applications 1 Date/Time: 10:30-11:45, Mon., October 12, 2020 Room: Tatry (by Zoom), Chair: Grzegorz Dudek	Session 1B: Pattern Classification 1 Date/Time: 10:30-11:45, Mon., October 12, 2020 Room: Zakopane (by Zoom), Chair: Patryk Najgebauer
A Synergy of Freezing and Dropout - A New Learning Strategy of Convolutional Networks *Michał Banach and Ewa Skubalska-Rafajłowicz*	Visualization of membership distribution in strings using heat maps *Łukasz Culer and Olgierd Unold*
Comparison of text classification methods for government documents *Konrad Ciecierski and Mariusz Kamola*	Random projection in the presence of concept drift in supervised environments *Moritz Heusinger and Frank-Michael Schleif*
DeepCloud: An Investigation of Geostationary Satellite Imagery Frame Interpolation for Improved Temporal Resolution *Luigi Cruz, Priscila Saito, and Pedro Bugatti*	Brazilian Lyrics-Based Music Genre Classification Using a BLSTM Network *Raul de Araújo Lima, Rômulo César Costa de Sousa, Hélio Cortes, Vieira Lopes, and Simone Diniz Junqueira Barbosa*
Are Direct Links Necessary in Random Vector Functional Link Networks for Regression *Grzegorz Dudek*	Machine Learning for Web Intrusion Detection: A Comparative Analysis of the Feature Selection Methods mRMR and PFI *Thiago Lucas, Carlos Tojeiro, Rafael Pires, Kelton Costa, and Joao Paulo Papa*
Artificial intelligent methods for the location of vortex points *Ewa Fraczek and Bartosz Idźkowski*	Semantic classifier approach to document classification *Piotr Borkowski, Krzysztof Ciesielski, and Mieczysław A. Kłopotek*

Session 2A: Neural Networks and Their Applications 2 Date/Time: 12:00-13:15, Mon., October 12, 2020 Room: Tatry (by Zoom), Chair: Maciej Jaworski	Session 2B: Pattern Classification 2 Date/Time: 12:00-13:15, Mon., October 12, 2020 Room: Zakopane (by Zoom), Chair: Patryk Najgebauer
Optimal fog services placement in SDN IoT network using Random Neural Networks and Cognitive Network Map *Piotr Fröhlich and Erol Gelenbe* Object Recognition: Building Best predictive Models Using ML and DL Approaches *Said Gadri and Erich Neuhold* Method of real time calculation of learning rate value to improve convergence of neural network training *Anton Glushchenko, Vladislav Petrov, and Konstantin Lastochkin* Application of an Improved Focal Loss in Vehicle Object Detection *Xuanlin He, Jie Yang, and Nikola Kasabov* Concept drift detection using autoencoders in data streams processing *Maciej Jaworski, Leszek Rutkowski, and Plamen Angelov*	A Mathematical Model for Optimum Error-Reject Trade-Off for Learning of Secure Classification Models in the Presence of Label Noise During Training *Seyedfakhredin Musavishavazi, Mehrdad Mohannazadeh Bakhtiari, and Thomas Villmann* Particle classification based on movement behavior in IPSO stochastic model *Krzysztof Wójcik, Tomasz Kulpa, and Krzysztof Trojanowski* Combination of Active and Random Labeling Strategy in the Non-stationary Data Stream Classification *Paweł Zyblewski, Paweł Ksieniewicz, and Michał Woźniak* Breast Cancer Classification from Histopathological Images Using Transfer Learning and Deep Neural Networks *Abdulrahman Aloyayri and Adam Krzyzak*

Invited Talks, Chair: Rafał Scherer, Room: Tatry (by Zoom)
14:30 - 15:15

Jarek Gryz – "Algorithms and Politics"

15:30 - 16:15

Bartosz Krawczyk – "Learning from imbalanced and difficult data"

Tuesday, October 13

Session 3A: Neural Networks and Their Applications 3 Date/Time: 9:00-10:15, Tuesday, October 13, 2020 Room: Tatry (by Zoom), Chair: Michał Grochowski	Session 3B: Bioinformatics, Biometrics and Medical Applications Date/Time: 9:00-10:15, Tuesday, October 13, 2020 Room: Zakopane (by Zoom), Chair: Marcin Woźniak
Explainable AI for inspecting adversarial attacks on deep neural networks *Zuzanna Klawikowska, Agnieszka Mikolajczyk, and Michał Grochowski* On the Similarity Between Neural Network and Evolutionary Algorithm *Lumir Kojecky and Ivan Zelinka* 3D Convolutional Neural Networks for Ultrasound-Based Silent Speech Interfaces *Tóth László and Amin Honarmandi Shandiz* Deep Recurrent Modelling of Stationary Bitcoin Price Formation Using the Order Flow *Ye-Sheen Lim and Denise Gorse*	The utilization of different classifiers to perform drug repositioning in Inclusion Body Myositis supports the concept of Biological Invariance *Óscar Álvarez-Machancoses, Enrique deAndrés-Galiana, Juan Luis, Fernández-Martínez, and Andrzej Kloczkowski* Predicting Coronary Artery Calcium Score from Retinal Fundus Photographs Using Convolutional Neural Networks *Sooah Cho, Su Jeong Song, Joonseok Lee, JiEun Song, Min Soo, Kim, Minyoung Lee, and JoonHo Lee* Mesh geometric parameters for modeling signal transmission in the presynaptic bouton *Maciej Gierdziewicz* Instance Segmentation of Densely Packed Cells Using a Hybrid Model of U-Net and Mask R-CNN *Tomasz Konopczynski, Ron Heiman, Piotr Woznicki, Pawel Gniewek, Marie-Cécilia Duvernoy, Oskar Hallatschek, and Juergen Hesser* Multi-agent Architecture for Internet of Medical Things *Dawid Połap, Gautam Srivastava, and Marcin Woźniak*

Session 4A: Neural Networks and Their Applications 4 Date/Time: 10:30-11:45, Tuesday, October 13, 2020 Room: Tatry (by Zoom), Chair: Bogdan Kwolek	Session 4B: Artificial Intelligence in Modeling and Simulation Date/Time: 10:30-11:45, Tuesday, October 13, 2020 Room: Zakopane (by Zoom), Chair: Grzegorz Dudek
6D Pose Estimation of Texture-less Objects on RGB Images Using CNNs *Vladyslav Lopatin and Bogdan Kwolek* Application of Neural Networks and Graphical Representations for Musical Genre Classification *Mateusz Modrzejewski, Szachewicz Jakub, and Przemysław Rokita* Deep Learning with Data Augmentation for Fruit Counting *Pornntiwa Pawara, Alina Boshchenko, Lambert Schomaker, and Marco Wiering* Approximation of Fractional Order dynamic systems using Elman, GRU and LSTM Neural Networks *Bartosz Puchalski and Tomasz A. Rutkowski* A Layer Wise Information Reinforcement Approach to Improve Learning in Deep Belief Networks	A parallel and distributed topological approach to 3D IC optimal layout design *Katarzyna Grzesiak-Kopeć and Maciej Ogorzałek* From Victim to Survivor: A Multilayered Adaptive Mental Network Model of a Bully Victim *Fakhra Jabeen, Charlotte Gerritsen, and Jan Treur* Faster Convention Emergence by Avoiding Local Conventions in Reinforcement Social Learning *Muzi Liu, Ho-fung Leung, and Jianye Hao* Empirical Mode Decomposition based data augmentation for time series prediction using NARX network *Olusola Oluwakemi Abayomi-Alli, Tatjana Sidekerskiene, Robertas Damasevicius, and Jakub Silka*

Mateus Roder, Leandro Passos, Luiz Ribeiro, Clayton Pereira, and Joao Papa	Ensemble Forecasting of Monthly Electricity Demand using Pattern Similarity-based Methods *Paweł Pelka and Grzegorz Dudek*

Session 5A: Neural Networks and Their Applications 5 Date/Time: 12:00-13:15, Tuesday, October 13, 2020 Room: Tatry (by Zoom), Chair: Marcin Woźniak	Session 5B: Computer Vision, Image and Speech Analysis 1 Date/Time: 12:00-13:15, Tuesday, October 13, 2020 Room: Zakopane (by Zoom), Chair: Rafał Scherer
Intestinal Parasites Classification Using Deep Belief Networks *Mateus Roder, Leandro Passos, Luiz Carlos Felix Ribeiro, Bárbara Benato, Alexandre Falcao, and Joao Papa* Data augmentation using principal component resampling for image recognition by deep learning *Olusola Oluwakemi Abayomi-Alli, Robertas Damasevicius, Michal Wieczorek, and Marcin Woźniak* Multiobjective evolution for convolutional neural network architecture search *Petra Vidnerová, Stepan Procházka, and Roman Neruda* Neural Network Subgraphs Correlation with Trained Model Accuracy *Izajasz Wrosz* Generative modeling in application to point cloud completion *Maciej Zamorski, Maciej Zięba, and Jerzy Śwątek*	Automatic visual quality assessment of biscuits using machine learning *Mardlla de S. Silva, Luigi F. Cruz, Pedro H. Bugatti, and Priscila T. M. Saito* Speaker Recognition using SincNet and X-Vector Fusion *Mayank Tripathi, Divyanshu Singh, and Seba Susan* Active Region-based Full-Disc Solar Image Hashing *Rafał Grycuk, Kosta Kelton, and Rafał Scherer* Inferring Colours in Paintings of M.F. Husain by Using Cluster Analysis *Shailendra Gurjar and Usha Ananthakumar* Automatic generation of parallel cache-efficient code implementing Zuker's RNA Folding *Marek Pałkowski, Włodzimierz Bielecki, and Mateusz Gruzewski*

Break

Session 6A: Data Mining 1 Date/Time: 14:30 - 15:45, Tuesday, October 13, 2020 Room: Tatry (by Zoom), Chair: Rafał Grycuk	Session 6B: Computer Vision, Image and Speech Analysis 2 Date/Time: 14:30 - 15:45, Tuesday, October 13, 2020 Room: Zakopane (by Zoom), Chair: Janusz Starczewski
A density-based prototype selection approach *Joel Carbonera and Mara Abel* FlexTrustRank: A new approach to link spamcombating *Dariusz Czerski, Paweł Łoziński, Mieczysław Alojzy Kłopotek, Bartłomiej Starosta, and Marcin Sydow* A Comparative Analysis of Similarity Measures in Memory-based Collaborative Filtering *Mara Deac-Petrus* Constructing Interpretable Decision Trees using Parallel Coordinates *Vladimir Estivill-Castro, Eugene Gilmore, and Rene Hexel* A framework for e-Recruitment Recommender System	Classifying Image Series with a Reoccurring Concept Drift Using a Markov Chain Predictor as a Feedback *Magda Skoczeń, Wojciech Rafajłowicz, and Ewaryst Rafajłowicz* Explainable cluster-based rules generation for image retrieval and classification *Paweł Staszewski, Maciej Jaworski, Leszek Rutkowski, and Dacheng Tao* SURF algorithm with convolutional neural network as face recognition technique *Alicja Winnicka, Karolina Kesik, Dawid Połap, and Marcin Woźniak* Grouping Handwritten Letter Strokes Using a Fuzzy Decision Tree *Michał Wróbel, Starczewski Janusz, and Christian Napoli* A new approach to detection of abrupt changes in black-and-white images

Mauricio Freire and Leandro Castro	*Tomasz Gałkowski and Adam Krzyzak*

Wednesday, October 14

Session 7A: Data Mining 2 Date/Time: 9:00 - 10:15, Wednesday, October 14, 2020 Room: Tatry (by Zoom), Chair: Paweł Karczmarek	Session 7B: Various Problems of Artificial Intelligence 1 Date/Time: 9:00 - 10:15, Wednesday, October 14, 2020 Room: Zakopane (by Zoom), Chair: Piotr Duda
The Influence of Feature Selection on Job Clustering for an E-Recruitment Recommender System *Joel Junior, Fabricio Vilasboas, and Leandro de Castro*	Is Chaotic Randomization Advantageous for Higher Dimensional Optimization Problems? *Roman Senkerik, Adam Viktorin, Tomas Kadavy, Michal Pluhacek, and Ivan Zelinka*
n-ary Isolation Forest: An Experimental Comparative Analysis *Paweł Karczmarek, Adam Kiersztyn, and Witold Pedrycz*	A Study of Bi-Space Search for Solving the One-Dimensional Bin Packing Problem *Derrick Beckedahl and Nelishia Pillay*
In-The-Limit Clustering Axioms *Mieczysław Kłopotek and Robert Kłopotek*	Explaining Machine Learning Models of Emotion Using the BIRAFFE Dataset *Szymon Bobek, Magdalena M. Tragarz, Maciej Szelążek, and Grzegorz Nalepa*
Hybrid features for Twitter Sentiment Analysis *Sergiu Limboi and Laura Diosan*	Pre-training Polish Transformer-based Language Models at Scale *Sławomir Dadas, Michał Perełkiewicz, and Rafał Poświata*
Newsminer: Enriched Multidimensional Corpus for Text-based Applications *Sahudy Montenegro González, Tiemi C. Sakata, and Rodrigo Ramos Nogueira*	On a streaming approach for training denoising auto-encoders *Piotr Duda and Lipo Wang*

Session 8A: Evolutionary Algorithms and their Applications 1 Date/Time: 10:30-11:45, Wednesday, October 14, 2020 Room: Tatry (by Zoom), Chair: Krystian Łapa	Session 8B: Various Problems of Artificial Intelligence 2 Date/Time: 10:30-11:45, Wednesday, October 14, 2020 Room: Zakopane (by Zoom), Chair: Maciej Kusy
Obstacle Avoidance for Drones based on the Self-Organizing Migrating Algorithm *Quoc Bao Diep, Thanh Cong Truong, and Ivan Zelinka*	Gradient Boosting and Deep Learning Models Approach to Forecasting Promotions Efficiency in FMCG Retail *Joanna Henzel and Marek Sikora*
Automatic Story Generation Based on Graph Model Using Godot Engine *Iwona Grabska-Gradzińska, Leszek Nowak, and Ewa Grabska*	A Fuzzy Multi-Agent Problem in a Conceptual and Operational Depiction *Krystian Jobczyk and Antoni Ligęza*
Optimization of the values of classifiers parameters – is it still worthwhile to deal with it? *Daniel Kostrzewa, Konrad Karczewski, and Robert Brzeski*	Generating Descriptions in Polish Language for BPMN Business Process Models *Krzysztof Kluza, Maciej Znamirowski, Piotr Wiśniewski, Paweł Jemioło, and Antoni Ligęza*
A Population-based Method with Selection of a Search Operator *Krystian Łapa, Krzysztof Cpałka, Tacjana Niksa-Rynkiewicz, and Lipo Wang*	Team Up! Cohesive Text Summarization Scoring Sentence Coalitions *Inez Okulska*
Fuzzy Control of Exploration and Exploitation Trade-off with On-line Convergence Rate Estimation in Evolutionary Algorithms *Adam Slowik*	Weighted Feature Selection Method for Improving Decisions in Milling Process Diagnosis *Roman Zajdel, Maciej Kusy, Jacek Kluska, and Tomasz Zabinski*

Session 9A: Evolutionary Algorithms and their Applications 2 Date/Time: 12:00 - 13:15, Wednesday, October 14, 2020 Room: Tatry (by Zoom). Chair: Marcin Zalasiński	Session 9B: Various Problems of Artificial Intelligence 3 Date/Time: 12:00 - 13:15, Wednesday, October 14, 2020 Room: Zakopane (by Zoom), Chair: Piotr Duda
On the Performance and Complexity of Crossover in Differential Evolution Algorithm *Petr Bujok* An Empirical Evaluation of Global Fitness Surrogate Models in Evolutionary Computation *Leonardo Emmendorfer* A Markov process approach to redundancy in genetic algorithm *Wojciech Rafajłowicz* An Improved Local Search Genetic Algorithm with Multi-Crossover for Job Shop Scheduling Problem *Monique Viana, Orides Morandin Junior, and Rodrigo Contreras* Signature partitioning using selected population-based algorithms *Marcin Zalasiński, Krzysztof Cpałka, Tacjana Niksa-Rynkiewicz, and Yoichi Hayashi*	MOEA-RS: A Content-Based Recommendation System Supported by a Multi-objective Evolutionary Algorithm *Matheus Santos Almeida and André Britto* New Surrogate Approaches Applied to Meta-Heuristic Algorithms *Joel A. Oliveira, Matheus Santos Almeida, Reneilson Y. C. Santos, Rene Pereira de Gusmao, and André Britto* Supervised classification methods for fake news identification *Thanh Cong Truong, Quoc Bao Diep, Zelinka Ivan, and Senkerik Roman* Visual hybrid recommendation systems based on the content-based filtering *Piotr Woldan, Piotr Duda, and Yoichi Hayashi* Short-term traffic flow prediction based on the intelligent parameter adjustment k-nearest neighbor algorithm *Xuan Zhao, Ruixuan Bi, Ran Yang, Yue Chu, Jianhua Guo, Wei Huang, and Jinde Cao*

Break

Session 10A: Agent Systems, Robotics and Control Date/Time: 14:30 - 15:45, Wednesday, October 14, 2020 Room: Tatry (by Zoom), Chair: Rafał Grycuk	Session 10B: Various Problems of Artificial Intelligence 4 Date/Time: 14:30 - 15:45, Wednesday, October 14, 2020 Room: Zakopane (by Zoom), Chair: Piotr Milczarski
Some Technical Challenges in Designing an Autonomous Moral Agent *Jarek Gryz* Hierarchical Intelligent-Geometric Control Architecture for Unmanned Aerial Vehicles Operating in Uncertain Environments *Mikhail Khachumov* Challenging Human Supremacy: Evaluating Monte Carlo Tree Search and Deep Learning for the Trick Taking Card Game Jass *Joel Niklaus, Michele Alberti, Rolf Ingold, Markus Stolze, and Thomas Koller* How Motivated Are You? A Mental Network Model for Dynamic Goal Driven Emotion Regulation *Nimat Ullah and Jan Treur* Cascade PID Controller Optimization using Bison Algorithm	Computer based stylometric analysis of texts in Ukrainian language *Anton Mazurko and Tomasz Walkowiak* Application of time series analysis and forecasting methods for enterprise decision-management *Anton Romanov, Nadezhda Yarushkina, and Aleksey Filippov* Identification of Delays in AMUSE algorithm for Blind Signal Separation of Financial Data *Ryszard Szupiluk and Paweł Rubach* Detecting Causalities in Production Environments using Time Lag Identification with Cross-Correlation in Production State Time Series *Dirk Saller, Bora Kumova, and Christoph Hennebold* Machine Learning Application in Energy Consumption Calculation and Assessment in Food Processing Industry

Anezka Kazikova, Krystian Lapa, Michal Pluhacek, and Roman Senkerik	*Piotr Milczarski, Bartosz Zieliński, Zofia Stawska, Artur Hłobaż, Paweł Maślanka, and Piotr Kosiński* Blue-White Veil Classification in Dermoscopy Images of the Skin Lesions using Convolutional Neural Networks *Piotr Milczarski and Łukasz Wąs*