

2020 International Conference on Pattern Recognition and Intelligent Systems

**PRIS 2020
In conjunction with PRA 2020**

Conference Program

<https://www.pris2020.org>

<http://www.pra2020.org>

Conference organized by
Asia Pacific Institute of Science and Engineering (APISE)

July 30-August 2, 2020 • Athens, Greece

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WELCOME MESSAGE

Due to COVID-19 pandemic, we have decided to change the main conference, the 2020 International Conference on Pattern Recognition and Intelligent Systems (PRIS 2020) in conjunction with the 2020 Workshop on Pattern Recognition Applications (PRA 2020) to be held online. Both PRIS 2020 and PRA 2020 are organized by Asia Pacific Institute of Science and Engineering.

The change of conference format will not influence on our conference's aim and pursuit. PRIS 2020 aims to present the latest research related to Pattern Recognition, Intelligent Systems and other related topics. By on-line oral presentations and poster presentation, this conference provides opportunities for the participants to exchange ideas, to establish professional relationships for future collaborations.

We emphasize that the change of conference form will not have negative impact on papers' publication and indexing. All the registered and presented papers of PRIS 2020 will be included in the volume of **ACM International Conference Proceedings Series**, which will be submitted to **EI Compindex, Thomson Reuters (WoS)** and other databases for review and indexing.

We would like to thank our outstanding Keynote Speakers: Prof. Wenbing Zhao from Cleveland State University, USA, Prof. Xiaoyi Jiang from University of Münster, Germany, Prof. Yonghong Peng from Manchester Metropolitan University, UK, and the Invited Speaker Dr. Raju Vatsavai from North Carolina State University, USA for sharing their deep insights on future challenges and trends.

We would like to thank all the committee members for their great support on organizing the conference and on reviewing the papers submitted to PRIS 2020 and PRA 2020. Special thanks to all the participants of the conference.



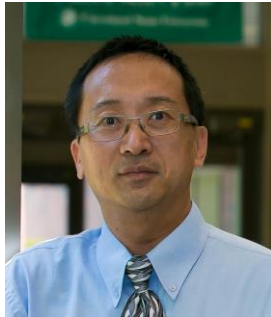
Prof. Wenbing Zhao

Cleveland State University, USA

PRIS 2020 Conference Chair

CONFERENCE SPEAKERS

Keynote Speakers



Prof. Wenbing Zhao

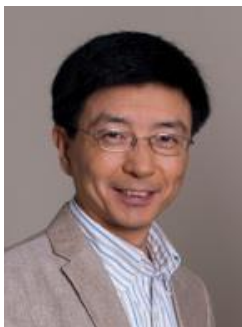
Cleveland State University, USA

Biography: Wenbing Zhao received his Ph.D. in Electrical and Computer Engineering at University of California, Santa Barbara, in 2002. Dr. Zhao has a Bachelor of Science degree in Physics in 1990, and a Master of Science degree in Physics in 1993, both at Peking University, Beijing, China. Dr. Zhao also received a Master of Science degree in Electrical and Computer Engineering in 1998 at University of California, Santa Barbara.

Dr. Zhao joined Cleveland State University (CSU) faculty in 2004 and is currently a Professor in the Department of Electrical Engineering and Computer Science (EECS) at CSU. Dr. Zhao published over 200 peer-reviewed papers in the area of distributed systems (three of them won the best paper award), smart and connected health, computer vision, machine learning, physics, and education. Dr. Zhao's research is supported in part by the US National Science Foundation, the US Department of Energy, the US Department of Transportation, Ohio State Bureau of Workers' Compensation, Ohio Department of Higher Education, and by Cleveland State University. Dr. Zhao is currently serving on the organizing committee and the technical program committee for numerous international conferences. He is an Associate Editor for IEEE Access and for MDPI Computers. Dr. Zhao is a senior member of IEEE.

Keynote Lecture: Video-Based Baseball Pitch Type Recognition

Unlike many other sectors in the society, the professional sports industry is driving technical innovations. Team owners, managers, and players recognize the huge value of technology for improving athlete performance, game officiating, as well as helping fans to better enjoy the games. A good example is the US major league baseball. In this talk, I report a preliminary study on video-based pitch type recognition using deep learning. To facilitate the study, we first developed a semi-automated way of building datasets based on publicly available video and pitch information for MLB games. For pitch type recognition, we used the two-stream inflated 3D convolutional neural network (I3D). To improve the state-of-the-art of research, we trained and tuned the I3D model extensively, primarily combating the problem of overfitting while still trying to improve final validation accuracy. We are able to achieve an accuracy of 53.43% +/- 3.04% when oversampling and 57.10% +/- 2.99% when not oversampling, which is a significant improvement over the published best result of an accuracy of 36.4% on the same six pitch type classes.



Prof. Xiaoyi Jiang

University of Münster, Germany

Biography: Xiaoyi Jiang studied Computer Science at Peking University and received his PhD and Venia Docendi (Habilitation) degree in Computer Science from University of Bern, Switzerland. He was an associate professor at Technical University of Berlin, Germany. Since 2002 he is a full professor at University of Münster, Germany, and currently the Dean of the Faculty of Mathematics and Computer Science. He is Editor-in-Chief of International Journal of Pattern Recognition and Artificial Intelligence. In addition, he also serves on the advisory

board and editorial board of several other journals including IEEE Transactions on Medical Imaging and International Journal of Neural Systems. His research interests include image analysis, pattern recognition, and machine learning. Prof. Jiang is a Fellow of IAPR (International Association for Pattern Recognition) and senior member of IEEE.

Keynote Lecture: Deciphering the “Thousand Words” of an Image: The Biomedical Imaging Perspective

Imaging has become an indispensable tool in biology and medicine for basic research and clinical practice. Biomedical image processing and analysis provide powerful methods and systems to uncover valuable information from the imagery data. The specific image characteristics and problems in these fields have motivated researchers to develop novel concepts and algorithms. This talk emphasizes the fundamental research view of biomedical imaging and discusses a number of challenges and related concepts and algorithms. Specific problems to be discussed include the small sample-size problem, scalable algorithms for large volumetric datasets, and guided deep learning using domain knowledge.



Prof. Yonghong Peng

Manchester Metropolitan University, UK

Biography: Prof Peng is a Professor of Artificial Intelligence and the Director of the Centre for Advanced Computational Science at the Manchester Metropolitan University UK. Prior to that, Prof Peng is a Professor of Data Science and the founding director for the Centre of Research and Innovation in Data Science at the University of Sunderland UK. His research interest includes AI and Data Science and their application to health informatics, genome and precision medicine. He is the

Chair for the Big Data Task Force (BDTF) of IEEE computational intelligence society (CIS), and a member of Data Mining and Big Data Analytics Technical Committee of IEEE CIS. He is also a founding member of the Technical Committee on Big Data (TCBD) of IEEE Communications, and a member of Big Data Task Force of China Information Industry Association (CIIA). He is an advisory board member for IEEE Special Interest Group (SIG) on Big Data for Cybersecurity. He is an Associate Editor for IEEE Transaction on Big Data, IEEE Access, and an Academic Editor of PeerJ and PeerJ Computer Science.

Keynote Lecture: AI-2030: toward Human-Machine Co-Intelligence

Big Data has become an incredibly powerful driver for technological innovation particularly it has made the boom of Artificial Intelligence (AI) economy. Artificial Intelligence is changing the way we do research and business. Aimed making machine intelligence, Artificial Intelligence (AI) has made huge contribution to the innovation in automation and problem solving through machine learning. With the emerging of Big Data, the next generation AI will not only be needed to enable machine intelligence for automation, but also be needed to empower human intelligence to deal with big data. Human intelligence is not sufficient in decision-making when facing big data, and will rely on machine intelligence to help. New framework is needed for the next ten years of AI research and development, shifting from making machine intelligence to finding new ways to empower human intelligence i.e. how to power human intelligence and machine intelligence to work together, as a partnership. The current development of explainable AI and interactive AI will all contribute toward this goal but it will also need new mechanism to build the trust between human intelligence and machine intelligence. This talk will discuss this sifting of the next generation AI, and explore the opportunity and the challenges.

Invited Speaker



Dr. Raju Vatsavai

North Carolina State University (NCSU), USA

Biography: Dr. Raju Vatsavai is a Chancellor’s Faculty Excellence Program Cluster Associate Professor in the computer science department at the North Carolina State University. He works at the intersection of spatial and temporal big data management, analytics, and high performance computing with applications in the national security, geospatial intelligence, natural resources, climate change, location-based services, and human terrain mapping. As the Associate Director of the Center for Geospatial Analytics (CGA), Raju plays a leadership role in the center’s strategic vision for spatial computing research. He has published more than 100 peer-reviewed articles in conferences and journals, and edited two books on “Knowledge Discovery from Sensor Data.” He served on program committees of leading international conference including ACM KDD, ACM GIS, ECML/PKDD, SDM, CIKM, IEEE BigData, and co-chaired several workshops including ICDM/SSTDM, ICDM/KDCloud, ACM SIGSPATIAL BigSpatial, Supercomputing/BDAC, KDD/LDMTA, KDD/Sensor-KDD, and SDM/ACS. He holds MS and PhD degrees in computer science from the University of Minnesota.

Invited Lecture: GeoAI: Deep Learning for Advanced Remote Sensing

Global earth observations with constellations of more than 100 operational satellites are providing unprecedented spatiotemporal data coverage, which can be exploited to continuously monitor key resources. Earth is a dynamical system continually changing due to both natural and human induced factors. Recent decades have witnessed major changes on the Earth, for example, deforestation, varying cropping and human settlement patterns, and crippling damages due to disasters. Monitoring this dynamic phenomenon is critical for human wellbeing. In this talk we explore recent advances in AI and machine learning for monitoring natural and as well as man-made structures at global scales and identify research challenges.

PRESENTATION PROGRAMME OVERVIEW

Date	Time	Programme
July 30 th , 2020	9:30-9:40	Opening Ceremony
	9:40-10:20	Keynote Speech 1 Prof. Wenbing Zhao
	10:20-10:50	Invited Speech Dr. Raju Vatsavai
	10:50-14:00	Lunch
	14:00-14:40	Keynote Speech 2 Prof. Xiaoyi Jiang
	14:40-15:20	Keynote Speech 3 Prof. Yonghong Peng
	15:20-16:35	Technical Session Pattern Recognition and Intelligent Systems
	16:35 -17:00	Poster Session
	17:00-17:10	Closing Ceremony

INSTRUCTIONS TO PRESENTATIONS

Materials Prepared and Provided by the Presenters:

Oral Presenter:

PowerPoint or PDF files

Duration of each Presentation (Tentatively 15 minutes)

Laptops (with MS-Office & Adobe Reader)

Poster Presenter:

Poster: color printing; Add Conference Name's Acronym on the top of poster (Such as "PRIS 2020" and paper ID)

Minutes of Q&A

Keynote Speech: 35 Minutes of Presentation and 5 minutes' Q&A

Invited Speech: 25 minutes of Presentation and 5 minutes' Q&A

Presenter: 10 Minutes of Presentation and 5 minutes' Q&A

Online Presentation Guide:

- 1) The online presenter shall download the defaulted tool/software on the presenter's own computer, which will be notified by the organizing group ahead.
- 2) When there is presenter giving a talk, others will be mute by the administrator. After each talk, other audience can push the "raise your hands" button, then the presenter and audience will go on Q&A process.
- 3) When giving a talk on-line, the presenter shall push the "sharing in the group" button, then everyone will watch the PPT online. And the presenter shall set "sharing voice in the PPT".

NOTICE:

- Certificate of Participation will be awarded after the conference finished via fast delivery.
- One best presentation will be selected from each session. The best one will be announced when each session ends, and will be awarded with a "Best Presentation" certificate.

Online Video Conference Operation Guide via VooV 腾讯会议在线视频会议操作指南

● 会议信息(Conference Information):

主题(Theme): PRIS & PRA 2020

时间: 2020年7月30日 上午9:30 (北京时间)

Time: 9:30 a.m. July 30, 2020 (Beijing time)

链接(Link):<https://meeting.tencent.com/s/NoVUB7hMx3vf>

会议 ID(Conference ID): 504850816

● 测试(Testing):

所有参会者可于测试时间进入会议室, 会议秘书会逐个安排做口头报告的参会者进行测试。

All the participants can join the conference room during the testing time, the conference secretary will arrange the participants who will do the oral presentation to test one by one.

测试时间: 2020年7月27日, 15:00-16:30 (北京时间)

Testing Time: July 27, 2020 15:00-16:30(Beijing time)

● 操作指南(Operation Guide):

1. 会议视频软件(video meeting software): VooV

下载链接(download link):

A.) 中文版

<https://meeting.tencent.com/download-mac.html?from=1001&fromSource=1> (Mac OS)

<https://meeting.tencent.com/download-win.html?from=1001&fromSource=1>

(Windows)

B.) International Version

<https://voovmeeting.com/download/darwin> (Mac OS)

<https://voovmeeting.com/download/windows> (Windows)

2. 加入会议(Join the Conference):

方法一: 点击会议链接(<https://meeting.tencent.com/s/NoVUB7hMx3vf>), 或选择“加入会议”后输入会议 ID: **504 850 816**。进入会议室时需填写手机号码进行验证; 验证完成后在入会名称处输入您的“文章编号+姓名”即可进入。

Method 1: Click the Conference link (<https://meeting.tencent.com/s/NoVUB7hMx3vf>), or click “Join the conference”, then input the Conference ID: **504 850 816**. When you join the conference room, you need to fill in your phone number for authentication, then fill in your “Paper ID +Name” at the “Name” to join the conference.

*注: 如您不能以游客身份直接“加入会议”, 建议您按照方法二注册一个账号, 登录后再加入会议。

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*Tip: Should you fail to “Join the Conference” as a visitor, we suggest you register an account by method 2, then log in and join the conference.

方法二: 您可在腾讯会议 APP 或官网 (<https://meeting.tencent.com/>) 中进行注册, 登录后通过链接或输入会议 ID 加入会议。

Method 2: You can register at the APP/ website (<https://www.voovmeeting.com/>), log in and join the conference by the link or tap the Conference ID.

● **注意(Note):**

- 会务组将在会议前 **5 分钟进行点名**, 请各位作者至少提前 5 分钟加入会议室。会议秘书将于会议当天 9:00 打开会议室等待各位加入。

The conference committee will **call the roll 5 minutes before** our conference, please join the conference in advance for at least 5 minutes. The conference secretaries will be waiting since 9:00.

- 会议期间**务必戴上耳机**以防外界噪音。同时建议请保持视频开启, 持续在线。
Please **wear headphones** during the meeting to block out the outside noise. Keeping the video on and keeping online are suggested.

- 请提前测试会议软件。

Please test the video meeting software in advance.

- 海报报告期间, 会务组将在“会议室”内上传所有海报报告文件。您可以下载电子海报进行查阅。但请注意, 所有文章尚未出版, 请**尊重文章版权**。

During the poster session, we will upload all the poster files in the “meeting room”. For learning more about posters, you could download the files to read only. But please note that, all materials have not been published, please **respect the paper originality and copyright**.

*注: 由于 VooV 国际版暂不支持文件上传与下载, 建议您使用中文版 VooV; 如您所在的国家或地区暂不支持下载中文版 VooV, 请您及时联系我们, 我们将以邮件的形式将电子海报发送给您。

*Note: Since International version does not support the function of file transmission, we recommend you to download Chinese version, then you can upload and download file smoothly. If Chinese version is not available in your country or region, you can download International version; as for e-posters, we could email you via email box once you requested.

- 建议您添加 APISE 官方咨询微信号(**APISE17358663189**), 会务组届时将创建 PRIS & PRA 2020 微信群, 以确保您及时接收会议信息。

Please follow WeChat for Consultation (**APISE17358663189**) for more information. PRIS & PRA 2020 Wechat Group will update conference information in realtime.

- 如有任何疑问, 您可点击 <https://meeting.tencent.com/> 以获取帮助, 或联系会议秘书: +86-17723329879(中国), +852-30506939 (中国香港)。

Should you have any further questions about this operation guide, please click <https://www.voovmeeting.com/> for help. You can also contact the conference secretary at +86-17723329879(China), +852-30506939 (Hong Kong).

TECHNICAL SESSION

Keynote Speech and Invited Speech Session 9:40-10:50, July 30, Thursday			
Time	No.	Content	Page
9:40-10:20	KN1	Video-Based Baseball Pitch Type Recognition <i>Prof. Wenbing Zhao</i> , Clevel and State University, USA	2
10:20-10:50	IS1	GeoAI: Deep Learning for Advanced Remote Sensing <i>Dr. Raju Vatsavai</i> , North Carolina State University (NCSU), USA	4
10:50-14:00	Lunch		
Keynote Speech Session 14:00-15:20, July 30, Thursday			
14:00-14:40	KN2	Deciphering the “Thousand Words” of an Image: The Biomedical Imaging Perspective <i>Prof. Xiaoyi Jiang</i> , University of Münster, Germany	2
14:40-15:20	KN3	AI-2030: toward Human-Machine Co-Intelligence <i>Prof. Yonghong Peng</i> , Manchester Metropolitan University, UK	3
Technical Session: Pattern Recognition and Intelligent Systems Session Chair: Prof. Xiaoyi Jiang 15:20-16:35, July 30, Thursday			
15:20-15:35	R010	Hand Movement Direction Decoding from EEG Signals under Dual Movement Tasks <i>Jiarong Wang</i> , Beijing Institute of Technology, China	13
15:35-15:50	R1002	A Statistical Defense Approach for Detecting Adversarial Examples <i>Alessandro Cennamo</i> , Bergische Universität Wuppertal, Aptiv Services GmbH, Germany	13
15:50-16:05	R2001	Person Authentication with BehavioSense using Keystroke Biometrics <i>Marina Zamsheva</i> , BehavioSec GmbH, Germany	14

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16:05-16:20	R012	Techniques for complex analysis of contemporary data <i>Jakub Peschel</i> , Masaryk University, The Czech Republic	14
16:20-16:35	R023	Feature's Selection-Based Shape Complexity for Writer Identification Task <i>Ameur Bensefia</i> , Higher Colleges of Technology, UAE	14
16:35-17:00	Poster Session		
17:00-17:10	Closing Ceremony		

Poster Session	
16:35-17:00, July 30, Thursday	
R001	Accurate iris segmentation for at-a-distance acquired iris/face images under less constrained environment <i>Ma Stella Tabora Domingo</i> , MIMOS Berhad, Malaysia
R017	A review of sonar image segmentation for underwater small targets <i>Yuanyuan Tian</i> , Northeast Electric Power University, China; Inner Mongolia University, China
R019	Multi-exposure image fusion method based on independent component analysis <i>Ying Huang</i> , Chongqing University of Posts and Telecommunications, China
R020	Semi-Supervised Classification Based On GAN <i>Chaowei Jin</i> , Zhejiang Gongshang University, China
R1003	Investigation of Faster-RCNN inception resnet v2 on offline kanji handwriting characters <i>Adole Anthony A</i> , Loughborough University, Uk
R1004	Electric vehicle battery swapping station design <i>Honghao Lu</i> , University of Manchester, UK
R1005	Non-reference image quality assessment for contrast distortion based on pixel statistics and color <i>Ying Huang</i> , Chongqing University of Posts and Telecommunications, China
R1007	A research on the architecture of coherent detection and its digital baseband algorithms <i>Wu Jing</i> , University of Electronic Science and Technology of China, China
R1008	Scotopic Vision Image Enhancement Algorithm Based on Retinex Model <i>Lijuan Xiang</i> , Chongqing University of Posts and Telecommunications, China
R1009	Research on image enhancement algorithm base on convolutional neural network in scotopic vision environment <i>Ying Zhao</i> , Chongqing University of Posts and Telecommunications, China
R1010	Research on voxel time-density model in cone-beam CT functional imaging <i>Ying Qian</i> , Chongqing University of Posts and Telecommunications, China
R1012	Detection and Recognition of Skin Cancer in Dermatoscopy Images <i>Shuo Zhao</i> , Chongqing University of Posts and Telecommunications, China
R1013	Optimized Phase-Shift Control Method Based on Load Current Feedforward for Bidirectional Full Bridge DC-DC Converters <i>Jiawei Zhang</i> , University of Nottingham Ningbo China, China
R1014	An investigation about optical millimeter-wave generation technology <i>Xinyu Liu</i> , North university of China, China

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R1015	Filter Pruning Based on Connection Sensitivity <i>Yinong Xu</i> , Chongqing University of Posts and Telecommunications, China
R1017	An investigation on high-speed optical transmission technology for datacenter <i>Wenxin Zeng</i> , Southwest Jiaotong University, China
R1018	Robotic Manipulation Based on 3D Vision: A Survey <i>Huahua Lin</i> , China Jiliang University, China
R301	Fault Diagnosis Of Remainers Inside PIGA Based On Pattern Recognition Algorithm <i>Lan Yue</i> , Beijing Aerospace Automatic Control Institute, China
R2002	A deep two-stage scheme for polycrystalline micro-crack detection <i>Sirui Chen</i> , Southeast University, Nanjing, China
R2003	A multilevel fire detection platform based on multi-source heterogeneous information fusion <i>Bichen Hua</i> , Southeast University, Nanjing, China

ABSTRACT

Technical Session: Pattern Recognition and Intelligent Systems

Time	Content
15:20-15:35	<p>R010: Hand Movement Direction Decoding from EEG Signals under Dual Movement Tasks</p> <p>Presenter: <i>Jiarong Wang</i>, Beijing Institute of Technology, China</p> <p>Abstract: Decoding human motor intention from electroencephalograms (EEG) signals is valuable for developing intelligent driver-assistive systems. However, existing studies about human motion decoding from EEG signals are only focused on one main movement task without considering the influence of other movement tasks. In this work, we explore the decoding of right-hand movement direction from EEG signals in the presence of a left-hand movement. A corresponding experimental paradigm was designed. The phase-locking value (PLV), amplitude in the time domain, and spectrum energy in the frequency domain from different frequency bands were used as classification features, respectively, and linear discrimination analysis (LDA) was used as a classifier to decode movement direction of the right hand. Experimental results showed that the decoding model based on the amplitude in the delta band performed best with a mean accuracy of 73.01% for the left-and-right direction pair, showing the feasibility of movement direction decoding of a single hand from EEG signals under a movement of the other hand.</p>
15:35-15:50	<p>R1002: A Statistical Defense Approach for Detecting Adversarial Examples</p> <p>Presenter: <i>Alessandro Cennamo</i>, Bergische Universität Wuppertal, Aptiv Services GmbH, Germany</p> <p>Abstract: Adversarial examples are maliciously modified inputs created to fool Machine Learning algorithms (ML). The existence of such inputs presents a major issue to the expansion of ML-based solutions. Many researchers have already contributed to the topic, providing both cutting edge-attack techniques and various defense strategies. This work focuses on the development of a system capable of detecting adversarial samples by exploiting statistical information from the training-set. Our detector computes several distorted replicas of the test input, then collects the classifier's prediction vectors to build a meaningful signature for the detection task. Then, the signature is projected onto a class-specific statistic vector to infer the input's nature. The class predicted for the original input is used to select the class-statistic vector. We show that our method reliably detects malicious inputs, outperforming state-of-the-art approaches in various settings, while being complementary to other defense solutions.</p>
15:50-16:05	<p>R2001: Person Authentication with BehavioSense using Keystroke Biometrics</p> <p>Presenter: <i>Marina Zamsheva</i>, BehavioSec GmbH, Germany</p> <p>Abstract: This paper presents some results of user authentication using BehavioSec software (BehavioSense). BehavioSense provides continuous authentication using behavioral biometrics. Two different public available databases were used in this work. The databases have different numbers of</p>

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	<p>training, test sets and data structure, so the experiments were carried out with different application scenarios. The best result for one of the databases in this study has the EER value only 2.38%.</p>
<p>16:05-16:20</p>	<p>R012: Techniques for complex analysis of contemporary data Presenter: <i>Jakub Peschel</i>, Masaryk University, The Czech Republic Abstract: Contemporary data objects are typically complex, semi-structured, or unstructured at all. Besides, objects are also related to form a network. In such a situation, data analysis requires not only the traditional attribute-based access but also access based on similarity as well as data mining operations. Though tools for such operations do exist, they usually specialise in operation and are available for specialized data structures supported by specific computer system environments. In contrary, advance analyses are obtained by application of several elementary access operations which in turn requires expert knowledge in multiple areas. In this paper, we propose a unification platform for various data analytical operators specified as a general-purpose analytical system ADAMiSS. An extensible data-mining and similarity-based set of operators over a common versatile data structure allow the recursive application of heterogeneous operations, thus allowing the definition of complex analytical processes, necessary to solve the contemporary analytical tasks. As a proof-of-concept, we present results that were obtained by our prototype implementation on two real-world data collections: the Twitter Higg's boson and the Kosarak datasets.</p>
<p>16:20-16:35</p>	<p>R023: Feature's Selection-Based Shape Complexity for Writer Identification Task Presenter: <i>Ameur Bensefia</i>, Higher Colleges of Technology, UAE Abstract: Writer Identification task has attracted a lot of research interests due to its wide variety of applications. Different approaches based on various features exist in the literature. However, all these approaches use all the information available in the handwritten sample to identify the writer (relevant or irrelevant). In this paper, we propose an original approach based on a double feature selection process, where the features are represented by graphemes resulting from a segmentation process. These features are analyzed based on their shape complexity, using the Fourier Elliptic transform, and the complexity score is assigned to each grapheme (FECS). The second phase of feature selection is to eliminate the redundancy among the resulting using a sequential clustering algorithm. Two similarity measures are proposed to evaluate the proposed system on 100 writers of the IAM dataset. We obtained a good identification rate of 96% using only 25 graphemes, which is equivalent to 3-4 words.</p>

CONFERENCE COMMITTEE

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Wenbing Zhao, Cleveland State University, USA

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Yizhang Jiang, Jiangnan University, China

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