Conference Program

26-28 July, 2019

Rome, Italy

ICFNN 2019

2019 International Conference on Frontiers of Neural Networks

FAIML 2019

2019 International Conference on Frontiers of Artificial Intelligence and Machine Learning

ICWNES 2019

2019 International Conference on Wireless Networks and Embedded Systems

ISCNC 2019

2019 International Symposium on Computing, Networking and Communications

Welcome

Dear Distinguished Participants,

Welcome to 2019 International Conference on Frontiers of Neural Networks(ICFNN 2019), 2019 International Conference on Frontiers of Artificial Intelligence and Machine Learning(FAIML 2019), 2019 International Conference on Wireless Networks and Embedded Systems(ICWNES 2019) and 2019 International Symposium on Computing, Networking and Communications (ISCNC 2019).

After one-year painstaking preparation, we're delighted to declare that July conference organized by IASED will be held in Rome, Italy as scheduled.

First of all, we'd like to express our sincere gratitude for your participation, which is the vital note to make the conference a great forum for the collision and fusion of ideas and knowledge. Besides, we'd like to say that the kind help and great efforts offered to our conference by our conference chair Prof. Massimo Marchiori is greatly appreciated. Meanwhile, we also appreciate our Keynote Speakers: Prof. Pedro Larrañaga, Dr. Tamer ElBatt and Prof. Massimo Marchiori who will share their newest and outstanding research achievements on the conference site.

In this big data age, the ever-changing information technology has updated and revolutionized the structure and content of our knowledge. The aim as well as the objective of ICFNN&FAIML&ICWNES &ISCNC 2019 is to present the latest research and results of Frontiers of Neural Networks, Frontiers of Artificial Intelligence and Machine Learning, Wireless Networks and Embedded Systems and Computing, Networking and Communications. By providing opportunities for the delegates to exchange new ideas face-to-face, to establish business or research relations as well as to find global partners for future collaborations, we do hope that the conference will intensify mutual improvement and facilitate academic exchange, as a result that leading to significant contributions to the knowledge in these up-to-date scientific fields.

Finally, we wish 'ICFNN&FAIML&ICWNES&ISCNC 2019' will be held with a complete success. At the same time, we wish you enjoy a very splendid time during the conference days in the impressive city of Rome, Italy!

Thank you!

ICFNN&FAIML&ICWNES&ISCNC 2019 Committee

General Information

❖ **Registration**

The registration desk will be situated at **Floor 1, Barceló Aran Mantegna** during the following time: **9:00-17:00, Friday 26 July, 2019.**

❖ **Remarks:** Conference will provide free coffee breaks**,** lunch and dinner on 27 July 2019, beyond the fixed menu will be on personal bill.

❖ **A Polite Request to All Participants**

Participants are requested to arrive in a timely fashion for all addresses. Presenters are reminded that the time slots should be divided fairly and equally by the number of presentations, and that they should not overrun. The session chair is asked to assume this timekeeping role and to summarize key issues in each topic.

❖**Dress Code:** Formal or national custom

❖ **Certificate**

Certificate of Attendance

A certificate of presentation indicates a presenter's name, affiliation and the paper title that is presented in the scheduled session, certifying the paper has been presented on the conference site.

Certificate of Best Paper & Best Student Paper & Best Poster

Presenters who presents a great oral presentation or poster presentation will be awarded as the Best Paper, the Best Student Paper or the Best Poster. The conference chair or the session chair will award a certificate of Best for them in the award ceremony on 27 July, 2019.

Certificate Distribution

Oral presenters will receive a certificate of presentation from the session chair at the end of your presentation.

Poster presenters will receive a certificate of presentation from the conference chair at the poster session.

Listener will receive a certificate from the conference chair at the end of the conference.

❖ **Preparation for Oral Presentations**

All presentation rooms are equipped with a screen, an LCD projector, and a laptop computer installed with Microsoft Power Point. You will be able to insert your USB flash drive into the computer and double check your file in PowerPoint. We recommend you to bring two copies of the file in case that one fails. You may also connect your own laptop to the provided projector; however please ensure you have the requisite connector.

Regular Oral Session: about 20 minutes of Presentation, 2-5 minutes of Q&A.

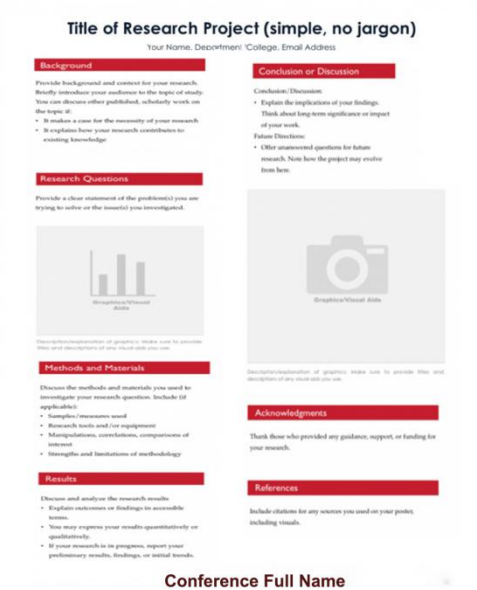
❖ **Preparation for Poster Presentation**

Materials Prepared by the Conference Organizer:

Adhesive tapes

Materials Prepared by the Presenters:

Home-made poster (s)
Material: not limited, can be posted on the canvases.
Recommended poster size: weight*height: A0 (841mm×1189mm).



Barceló Aran Mantegna

Address: Via Mantegna 130, Eur & Garbatella, 00147 Rome, Italy

❖ **Transportation**

Distance from the Leonardo Da Vinci AIRPORT FCO: 24 km

Distance from Ciampino G.B. Pastine AIRPORT CIA: 15 km.

from both Airport the Hotel can be reached through public taxi service from Euro 50,00 one way.

Metro B San Paolo stop: 2km, the Hotel can be reached through the bus line 766, bus stop ACCADEMIA.

AGIATI/AMBROSINI at 100 mt from the 'hotel.

Stazione Termini: 7 km, the Hotel can be reached through the bus line 714, bus stop COLOMBO/RUFINO at 100 mt from the 'hotel.

Shuttle Bus on a daily taimetable, to/from Piazza Venezia, service up to capability, it can not be reserved in advance, Euro 5,00 per person, one way.

Venue

Item	Room
Registration	Floor 1, Barceló Aran Mantegna
Welcome	3A Room, Floor -2, Barceló Aran Mantegna
Keynote Session	3A Room, Floor -2, Barceló Aran Mantegna
Oral Presentation	3A Room, Floor -2, Barceló Aran Mantegna
Coffee Break	Prefunction, 3A Room
Poster Presentation	Prefunction, 3A Room
Award Ceremony & Closing Ceremony	3A Room, Floor -2, Barceló Aran Mantegna
Lunch	Parnaso Restaurant， Floor -1,Barceló Aran Mantegna
Dinner	Parnaso Restaurant， Floor -1,Barceló Aran Mantegna

Program Overview

	Friday 26-July	**Saturday** 27-July	**Sunday** 28-July
09:00-09:15	Registration	Welcome Address	Free Day
09:15-10:00		Keynote Speech 1 **Prof. Pedro Larrañaga**	
10:00-10:30		*Coffee Break & Group Photo*	
10:30-11:15		Keynote Speech 2 **Dr. Tamer ElBatt**	
11:15-12:00		Keynote Speech 3 **Prof. Massimo Marchiori**	
12:00-13:00		Lunch	
13:00-13:20		Oral Presentation	
13:20-13:40			
13:40-14:00			
14:00-14:20			
14:20-14:40			
14:40-15:00			
15:00-15:40		Coffee break&Poster presentation	
15:40-16:00		Oral Presentation	
16:00-16:20			
16:20-16:40			
16:40-17:00			
17:00-17:20			
17:20-17:40			
17:40-18:10		Award & Closing Ceremony	
18:10-19:10		Dinner Banquet	

Keynote Session

Keynote Speech 1

09:00-09:45, Saturday, 27th July, 2019

3A Room, Floor -2, Barceló Aran Mantegna

Title: Bayesian Networks: Challenging Applications

Prof. Pedro Larrañaga

Technical University of Madrid, Spain

Abstract

The recent use of Bayesian networks in challenging real world applications will be presented in three different areas: neuroscience, industry4.0 and sport analytics.

Neuroscience applications will cover problems at different scales: from neuroanatomy questions, such as interneuron classification and spine clustering, to diagnosis of neurodegenerative Parkinson and Alzheimer diseases. The applications in industry4.0 will be related to the automatic inspection of a laser process and the discovery of fingerprints in a real machinery performing servo-motor movements. Finally, the scouting problem and the football as a science will be introduced as representatives of sport analytics.

From the machine learning point of view, several techniques, such as probabilistic clustering, multi-view clustering, anomaly detection, supervised classification, multi-label classification and multi-output regression, in both static and dynamic scenarios will be used for providing solutions to the previous real world applications.

Introduction to Prof. Pedro Larrañaga

Pedro Larrañaga is Full Professor in Computer Science and Artificial Intelligence at the Technical University of Madrid (UPM) since 2007. He received the MSc degree in mathematics (statistics) from the University of Valladolid and the PhD degree in computer science from the University of the Basque Country ("excellence award"). Before moving to UPM, his academic career has been developed at the University of the Basque Country (UPV-EHU) at several faculty ranks: Assistant Professor (1985-1998), Associate Professor (1998-2004) and Full Professor (2004-2007). He earned the habilitation quali fi cation for Full Professor in 2003. He co-leads the Computational Intelligence Group (CIG) since its foundation in 2008.

His research interests are primarily in the areas of probabilistic graphical models, metaheuristics for optimization, data mining, classification models, and real applications, like biomedicine, bioinformatics neuroscience, and industry4.0. He has published more than 150 papers in impact factor journals and has supervised more than 20 PhD theses. He is ECCAI felow since 2012 and he has been awared the 2013 Spanish National Prize in Computer Science.

Coffee Break & Group Photo

Saturday, 27th July, 2019	10:00-10:30	3A Room, Floor -2

Keynote Session

Keynote Speech 2

10:30-11:15, Saturday, 27th July, 2019
3A Room, Floor -2, Barceló Aran Mantegna

Title: Edge Computing: A Key Enabler for 5G and IoT

Dr. Tamer ElBatt

American University in Cairo, Egypt

Abstract

Edge Computing brings cloud computing-like services to the network edge for a variety of benefits. In this talk, we present our recent research activities and vision and touch upon sample topics on the key role of Edge Computing in content caching in 5G and big data analytics for the Internet of Things (IoT).

Towards this objective, we first present our recent work on the fundamental limits of decentralized coded content delivery in Fog Radio Access Networks (F-RANs). More specifically, we introduce a general information-theoretic model for a 5G network with cache-aided Kt edge nodes and Kr wireless users. Our main result is characterizing in closed-form the normalized delivery time (NDT) performance metric for a 2 x Kr F-RAN.

In the second part of the talk, we shift gears to IoT where we make the case for the major role of edge analytics, complementing cloud analytics, in handling IoT big data. This vision promises to enable large-scale IoT use cases with massive data, e.g., Industrial IoT (IIoT), real-time decisions, e.g., autonomous driving, and/or handling private (sensitive) data, e.g., healthcare. We shed light on the major research challenges and a roadmap in this ripe area of research with great promise.

Introduction to Dr. Tamer ElBatt

Tamer ElBatt received the B.S. and M.S. degrees in EECE from Cairo University, Egypt in 1993 and 1996, respectively, and the Ph.D. degree in Electrical and Computer Engineering from the

University of Maryland, College Park, MD, USA in 2000. From 2000 to 2009 he was with major U.S. industry R&D labs, e.g., HRL Laboratories, LLC, Malibu, CA, USA and Lockheed Martin ATC, Palo Alto, CA, USA, at various positions. From 2009 to 2017, he served at the EECE Dept., Faculty of Engineering, Cairo University, as an Assistant Professor and later as an Associate Professor, currently on leave. He also held a joint appointment with Nile University, Egypt from 2009 to 2017 and has served as the Director of the Wireless Intelligent Networks Center (WINC) from 2012 to 2017. In July 2017, he joined the Dept. of CSE at the American University in Cairo as an Associate Professor. Dr. ElBatt research has been supported by the U.S. DARPA, ITIDA, Qatar QNRF, EU FP7, H2020, General Motors, Microsoft, Google and Vodafone Egypt Foundation and is currently being supported by ITIDA. He has published more than 130 papers in prestigious journals and international conferences. Dr. ElBatt holds seven issued U.S. patents and one WIPO patent.

Dr. ElBatt is a Senior Member of the IEEE and has served on the TPC of numerous IEEE and ACM conferences. He is serving as the publicity co-chair of IEEE VTC-Spring 2020, has served as the Demos Co-Chair of ACM Mobicom 2013 and the Publications Co-Chair of IEEE Globecom 2012 and EAI Mobiquitous 2014. Dr. ElBatt currently serves on the Editorial Board of IEEE Transactions on Cognitive Communications and Networking and Wiley International Journal of Satellite Communications and Networking and has previously served on the Editorial Board of IEEE Transactions on Mobile Computing. Dr. ElBatt has also served on the United States NSF and Fulbright review panels. Dr. ElBatt was a Visiting Professor at the Dept. of Electronics, Politecnico di Torino, Italy in Aug. 2010, Faculty of Engineering and Natural Sciences, Sabanci University, Turkey in Aug. 2013 and the Dept. of Information Engineering, University of Padova, Italy in Aug. 2015. Dr. ElBatt is the recipient of the prestigious Google Faculty Research Award in 2011, the 2012 Cairo University Incentive Award in Engineering Sciences and the 2014 Egypt's State Incentive Award in Engineering Sciences. His research interests lie in the broad areas of performance analysis, design and optimization of wireless and mobile networks

Keynote Speech 3

11:15-12:00, Saturday, 27th July, 2019

3A Room, Floor -2, Barceló Aran Mantegna

Title: Pending

Prof. Massimo Marchiori (UNIPD), Technical Director (EISMD)

University of Padua, Italy; European Center for Science, Media and Democracy, Belgium

Abstract

Pending

Introduction to Prof. Massimo Marchiori

Massimo Marchiori is currently Professor at the University of Padua (Italy) and Technical Director of the European Institute for Science, Media and Democracy (Belgium). Working at MIT (USA) he led the development of several world standards, like P3P (web privacy), XQuery (semi-structured information) and OWL (web reasoning).

Among others, he created Hypersearch (Google's forerunner), Volunia (the next-generation social search engine), Negapedia (the negative version of Wikipedia).

He works in many multidisciplinary fields, also in cooperation with several companies, focusing on new technologies that can impact our society.

He won a variety of awards, including the IBM research award, the Lifetime Membership Award of the Oxford Society, the Microsoft Data Science Award, the MIT Technology Review TR35 award given to the world best innovators.

Lunch

Saturday, 27th July, 2019	**12:00-13:00**	**Parnaso Restaurant, Floor -1**

Oral Presentation

Saturday, 27th July, 2019 **13:00-15:00** **3A Room, Floor -2**

Conference Chair: Prof. Massimo Marchiori

NC1001
Dr.Jianbin Zou
National University of Defense Technology, China
20 min

10Gbps Real-time OFDM Wireless Communication System
Jianbin Zou | Kai Gao , Erbao Li

This paper presents a 10 Gbps real-time millimeter wave OFDM experimental system using a highly efficient 64APSK modulation and 7/8 rate LDPC coding scheme. For the sensitivity of phase noise and the high peak to average power ratio (PAPR) in OFDM systems, common phase error (CPE) compensation algorithm and partial transmit sequence (PTS) PAPR suppression algorithm are implemented in this system. In this paper, a real-time 10Gbps 64-APSK end to end wireless transmission experiment system using reconfigurable Field Programmable Gate Array (FPGA) baseband modulator has built to verify the feasibility and effectiveness of our scheme.

NC1002
Prof.Francesco Buccafurri
DIIES Dept., University of Reggio Calabria Feo di Vito, 89122 Reggio Cal., Italy
20 min

A Blockchain-Based OTP-Authentication Scheme for Constrainded IoT Devices Using MQTT
Francesco Buccafurri | Celeste Romolo

The importance of the Internet of Things is constantly grow- ing, together with the proliferation of IoT devices which are changing our daily life and empowering industrial processes. However, the most IoT devices and protocols were not de- signed with security in mind, and economic and energy- consumption constraints make the implementation of secu- rity measures a non-trivial problem. One of the most used messaging protocol in IoT, which is MQTT (Message Queu- ing Telemetry Transport), leaves to developers the task to implement security, as native security services provided by the protocol are very weak. This paper focuses on MQTT authentication, which is definitely insecure in the protocol, even though the implementations can combine MQTT with other protocols/mechanisms to obtain a suitable level of se- curity. The aim of the present work is to propose an in- novative OTP-authentication scheme for MQTT which uses Ethereum to implement an independent logic channel for the second-factor authentication. The implementation of the proposed scheme relies on the trusted behavior of smart contracts and adopts suitable strategies to preserve privacy of users.

IM008
Prof.JIYUN LI

Study on Medical Imaging ReportsTagging Extraction Based on Bi-LSTM+CRF
JIYUN LI | KAIHUA LI

As an important information carrier for hospital to record medical activities for patients, medical imaging report contains a large amount of technical terms and medical knowledge. In order to automatically generate computer-aided

Donghua University ,China **20 min**	diagnosis reports, it is necessary to extract effective information from medical image reports, so as to reduce the pressure of professional physicians and better serve clinical decision-making. This paper mainly focuses on mammography medical imaging reports, analyzes the structure and contents of the reports, and deals with the imaging reports using the machine learning model, called Bi-LSTM + CRF (Bidirectional Long Short Term Memory with a Conditional Random Fields layer), in order to extract tags of the lesion, such as the position, size and shape in the imaging reports. The experimental results achieved satisfactory effort.
 **IM010** **Dr.Shuai Wang** **(Student)** Computer Department, Key Laboratory of High Confidence Software Technologies Peking University Beijing, China **20 min**	**Deep Learning Based Code Completion Models for Programming Codes** **Shuai Wang** | Jinyang Liu | Ye Qiu | Zhiyi Ma | Junfei Liu | Zhonghai Wu With the fast development of Information Technology, program software and mobile applications have been widely used in the world, and are playing important roles in human's daily life. Thus, writing programming codes has been important work in many fields. however, it is a hard and time-cost task which presents a great amount of workload to programmers. To make programmers' work easier, intelligent code completion models have been a popular research topic in recent years. This paper designs Deep Learning based models to automatically complete programming codes, which are LSTM-based neural networks, and are combined with several techniques such as Word Embedding models in NLP (Natural Language Processing), and Multihead Attention Mechanism. Moreover, in the models, this paper raises a new algorithm of generating input sequences from partial AST (Abstract Syntax Tree) that have most relevance with nodes to be predicted which is named as RZT (Reverse Zig-zag Traverse) Algorithm, and is the first work of applying Multihead Attention Block into this task. This paper makes insight into codes of several different programming languages, and the models this paper presents show good performances in accuracy comparing with the state-of-art models.
 **IM011** **Utkars Jain** **(Student)** Heart Input Output, Inc. USA **20 min**	**Localization of Myocardial Infarction from 12 Lead ECG Empowered with Novel Machine Learning** **Utkars Jain** | Mazen Megahed | Michael Leasure | Adam Butchy | Nick Flanigan There are multiple modalities used to diagnose abnormal- ities of the heart consisting of various invasive and noninva- sive tests. Patients may undergo multiple tests, progressing to more invasive methods at the expense of patient risk and cost to the pair. HEARTio, through machine learning and algorithmic processing our proprietary software, hopes to im- prove the accuracy of the electrocardiography: a century old technology and the most commonly performed cardiac test. It is used to diagnose heart attacks, heart rhythm problems and operates as the gateway testing for patients undergoing cardiac evaluation. Myocardial infarction, or heart attacks, affect almost 800,000 Americans yearly [3] with time to treatment being the most important factor in

recovery and therapy. We show in this paper that we are able to localize and detect myocardial infractions at an accuracy above 99% by applying our system to the PTB database.

IM012
Melike Günay
Istanbul Kültür University , Turkey
20 min

Disease Prediction Using Weighted Artificial Immune System
Melike Günay | Zeynep Orman

The Artificial Immune System (AIS) is a computational intelligence method inspired from human immune system, which is applied to real-world problems related to classification, optimization and anomaly detection as an alternative approach to many data mining techniques. This paper presents a medical disease prediction system by using the AIS algorithm. The proposed system is implemented and tested on two different datasets which include breast cancer data and heart disease data with four different types of illness. Two other well-known data mining techniques that are Artificial Neural Networks (ANN) and K-Nearest Neighbor (KNN) are also tested on the same datasets to make a comparison with the proposed system in terms of their classification efficiency. By using AIS, accuracy obtained on breastcancer dataset is 98.08% and heart disease dataset is 70%. In addition to this, AIS algorithm gives the best classification results for both datasets. We have also analyzed the positive effects of preprocessing data before classification. Clearly, decreasing the number of different values that a class can be assigned for multivariate classes and assigning weights to each feature in heart disease dataset result with higher accuracy.

Coffee Break & Poster Session

Saturday, 27th July, 2019	**15:00-15:40**	**Prefunction, 3A Room**

Poster

Oral Presentation

Saturday, 27th July, 2019 **15:40-17:40** **3A Room, Floor -2**

IM020
Hyunduk Kim
DGIST, Republic of Korea
20 min

Real-time Head Detection for Automated Passenger Counting in Embedded Systems

Hyunduk Kim | Sang-Heon Lee | Myoung-Kyu Sohn

Head detection is a key problem for automated passenger counting systems. In recent decades, considerable effort has been expended to develop an accurate and reliable head detector. However, head detection is still a challenging task because of problems caused by variations in pose and occlusions. Recently, general object detection algorithms based on convolutional neural networks (CNNs), such as Faster R-CNN, SSD and YOLO, have been successful. However, these algorithms require the use of a Graphics Processing Unit (GPU) for real-time performance. In this study, we focused on developing real-time head detection in an embedded system. Starting with the Tiny-YOLOv3 network, we applied the following strategies to achieve real-time performance in a non-GPU environment. First, we reduced the input image size to 224×224. Second, we added an extra yolo layer to detect smaller heads. Third, we removed batch normalization. Finally, we conducted depthwise separable convolution rather than traditional convolution. Three public datasets, HollywoodHeads, SCUT_HEAD, and CrowdHuman, were exploited to train and test the proposed network, and Average Precision (AP) at Intersection over Unit (IoU) = 0.5 were used to evaluate the tests. Experimental results showed that the proposed network perform better and faster than Tiny-YOLOv3.

NN001
Dr.Muhammadjon Musaev
Tashkent University of Information Technologies, Uzbekistan
20 min

Image approach to speech recognition based on CNN

Muhammadjon Musaev | Ilyos Khujayorov | Mannon Ochilov

In this paper has been discussed about speech recognition using spectrogram images and deep convolution neural network(CNN) of Uzbek spoken digits. Spectrogram images from speech signal were generated and it were used for deep CNN training. Presented CNN model contains 3 convolution layers and 2 fully connected layers that discriminative features can be divided and estimated of spectrogram images by those layers. In current research period, dataset of Uzbek spoken digits were made and in based on presented CNN model they were trained. Testing results shows that, proposed approach for Uzbek spoken digits classified 100% accuracy.

ES004

Jens Vankeirsbilck
Dept. Computer Science, KU Leuven Bruges Campus, Belgium

20 min

Automatic Implementation of Control Flow Error Detection Techniques

Jens Vankeirsbilck | Hans Hallez | Jeroen Boydens

Modern embedded systems are prone to erroneous bit-flips introduced in its hardware by external disturbances such as alpha particles, electromagnetic interference or intentional external attackers. In order to protect embedded systems against these disturbances, a wide variety of software-implemented detection techniques have been proposed, a.o. by the authors of this paper. Implementing those techniques, however, can be arduous and error-prone since they have to be implemented in low-level code, e.g. assembly. To over come this problem we propose a compiler extension, in the form of a plugin, that can automatically add any supported technique to the low-level code of the target program. We discuss the internal working of our compiler extension and conclude with a demonstration using an example program and validate the effectiveness of the introduced countermeasures by running a fault injection campaign.

ES002

Nkyi Stephen
Nanjing University of Aeronautics and Astronautics, Nanjing-China

20 min

INTEGRATED ROUND TRIP PATH DUAL REGISTERS (RTP/DR) FAULT DETECTION

Nkyi Stephen | Yan Xue Feng | Rodor Gershon | Kusi Ankrah Bonsu

the numerous application of wireless sensor networks (WSNs) in every facet of today's world demands prompt detection and classification of faults. In this paper, an integrated round trip path dual registers (RTPDR) is presented which combines Round Trip Paths (RTP) and Dual Registers (DR) for detection and classification of node failure, node reboot and link failure diagnosis. Round trip path is adopted for nodes grouping and threshold monitoring. Detection and classification of faults are done by comparison of dual registers using each path traversed by a packet from the source node. Two different registers are kept and updated respectively depending on the path traversed by a packet to detect anomalous behaviors. The results from simulation in MATLAB demonstrates the proposed technique achieves better detection latency, false alarm rate and false positive rate when compared with existing protocols.

ES003

Ajay Kaushik
Senior Research Fellow (Ph.D.), Computer engineering,

Energy efficient wireless sensor network using multi objective biogeography based optimization

Ajay Kaushik | Prof. S. Indu | Prof. Daya Gupta

Wireless sensor networks (WSNs) consist of numerous tiny battery operated sensor nodes (SNs) that dissipate energy in data routing to the sink. An efficient routing scheme is imperative for long lasting operation of a WSN. In WSN routing, routing hop count and inter hop routing distance are conflicting objectives, minimization of routing hops may increase the inter hop routing distance and vice versa. We propose a novel Multi Objective Biogeography Based Optimization algorithm that optimizes both conflicting objectives of WSN routing (MOBBO-R) and minimize the energy consumption in a WSN. The proposed algorithm finds a pareto optimal solution between conflicting

Delhi Technological University, Delhi, India **20 min**	routing objectives and prolongs the WSN lifetime by optimizing its routing process. MOBBO-R is validated using Matlab and performs better than other routing algorithms in the past such as PSO routing and neighborhood routing by 7% and 22% respectively. MOBBO-R can be useful in many IoT (Internet of Things) and IoE (Internet of Everything) based applications around the world.

Poster Session

Saturday, 27th July, 2019	**15:00-15:20**	**Prefunction, 3A Room**
5-minute oral presentation with demo on stage		
Session Chair: Prof. Massimo Marchiori		
NC001	**Wei Ding** North Automatic Control Technology Institute, China *Using Graph Representations for Semantic Information Extraction from Chinese Patents*	
IM007	**Bai Fan** Northeastern University, China *Robotic Grasp Pose Estimation Oriented Deep Learning Algorithm Based on Residual Network*	
IM008	**Kaihua Li** Donghua University,China *Study on Medical Imaging Reports Tagging Extraction Based on Bi-LSTM+CRF*	
IM026	**Zhiyang Zhang** Beijing University of Posts and Telecommunications,China *A Multi-Radar Track Fusion Methodology Based on Random Forest Regression*	

Poster Session

Saturday, 27th July, 2019	15:20-15:40	Prefunction, 3A Room

Poster Session (Poster presentation and discussion at the poster display)

Session Chair: Prof. Massimo Marchiori

NC001
Wei Ding
North Automatic Control Technology Institute, China

Using Graph Representations for Semantic Information Extraction from Chinese Patents

Wei Ding | Junli Wang | Haohao Zhu

This paper proposes a graph representation approach to automatically extract semantic information from Chinese patents, which can be used to provide semantic support for text-content based patent intelligent analysis. Two graph models are devised using graph representations, i.e., a keyword based text graph model and a dependency tree based text graph model。 The first graph model is constructed by computing the similarities between two keywords, while the second graph model is constructed by extracting syntactic relations from text sentences. In the case study a frequent subgraph mining algorithm is utilized to discover frequent sub graph patterns based on the above two models, and such patterns were further used as features to build text classifiers for the purpose of testing the expressivity and effectiveness of the proposed graph models.The experimental results proves the validation of the proposed graph representation methods.

IM007
Bai Fan
Northeastern University, China

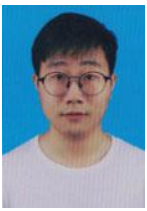
Robotic Grasp Pose Estimation Oriented Deep Learning Algorithm Based on Residual Network

Fan Bai | Renjie Yao | Maoning Chen | Zhexin Cui

Autonomous manipulator grasp is an important issue in robotics research. To obtain the optimal grasp pose, we combine manipulator vision and deep learning to realize the artificial intelligence of the manipulator grasp. We adopt the idea of using residual network to improve the generative grasping convolutional neural network (GG-CNN). Firstly, we build a convolution residual module. By piling multi-layer of residual modules, we can build the residual network and deepen the depth of the convolutional neural network, which is used as the main part to improve GG-CNN. Improved GG-CNN based on deep residual network enhances the accuracy of the optimal grasping pose generation of the manipulator. Experimental results show that the accuracy of the improved GG-CNN model based on residual network reaches 88%, which is much higher than the original model's accuracy of 72%. It significantly improves the accuracy of the model to predict the optimal grasp pose of the manipulator.

Study on Medical Imaging Reports Tagging Extraction Based on Bi-LSTM+CRF

Kaihua Li | Jiyun Li



IM008
Kaihua Li
Donghua University,China

As an important information carrier for hospital to record medical activities for patients, medical imaging report contains a large amount of technical terms and medical knowledge. In order to automatically generate computer-aided diagnosis reports, it is necessary to extract effective information from medical image reports, so as to reduce the pressure of professional physicians and better serve clinical decision-making. This paper mainly focuses on mammography medical imaging reports, analyzes the structure and contents of the reports, and deals with the imaging reports using the machine learning model, called Bi-LSTM + CRF (Bidirectional Long Short Term Memory with a Conditional Random Fields layer), in order to extract tags of the lesion, such as the position, size and shape in the imaging reports. The experimental results achieved satisfactory effort.

IM026
Zhiyang Zhang
Beijing University of Posts and Telecommunications,China

A Multi-Radar Track Fusion Methodology Based on Random Forest Regression
Zhanchun Gao | Zhiyang Zhang

This paper introduces a multi-radar track fusion method based on random forest regression and provides an accurate and stable fusion track. The increasing number of aircraft will lead to congested routes, further leading to safety issues. Therefore, an effective track fusion method can accurately locate the aircraft, thereby ensuring the safety of the aircraft in the case of crowded routes. The basic idea of the method proposed in this paper is to select the radar data of a certain track of a certain day to train the model, and predict the position of the aircraft on the next day of the track through the trained model. As a traditional track fusion algorithm, the Kalman filtering has the problem of requiring accurate error estimation, insensitivity to noise, and long calculation time in the case of large data volume. The neural network method that compensates for these shortcomings also has the disadvantage of poor generalization ability in the case of a large amount of noise.
The random forest regression model proposed in this paper can overcome the shortcomings of over-fitting in neural network, so it can achieve better prediction results. And through the real data test, the average error is 40m, compared with the neural network method, the result is increased by 50%.

Video Session

Saturday, 27th July, 2019	**3A Room, Floor -2**
Conference Chair: Prof. Massimo Marchiori	
AI Decor **Sharmin Pathan**	

IM029
Sharmin Pathan
SAS Institute, INDIAN

Confused about renovating your space? Choosing the perfect color for your walls is always a challenging task. One does rounds of color consultation and several patch tests. This paper proposes an AI tool to pitch paint based on attributes of your room and other furniture, and visualize it on your walls. It makes the color selection process a whole lot easier. It basically takes in images of a room, detects furniture objects using YOLO object detection. Once these objects have been detected, the tool picks out color of the object. Later this object specific information gets appended to the room attributes (room_type, room_size, preferred_tone, etc) and a deep neural net is trained to make predictions for color/texture/wallpaper for the walls. Finally, these predictions are visualized on the walls from the images provided. The idea is to take the knowledge of a color consultant and pitch colors that suit the walls and provide a good contrast with the furniture and harmonize with different colors in the room. Transfer learning for YOLO object detection from the COCO dataset was used as a starting point and the weights were later fine-tuned by training on additional images. The model was trained on 1000 records listing the room and furniture attributes, to predict colors. Given the room image, this method finds the best color scheme for the walls. These predictions are then visualized on the walls in the image using image segmentation. The results are visually appealing and automatically enhance the color “look-and-feel”.

Listener

Saturday, 27th July, 2019 **3A Room, Floor -2**

IM011-1

Mazen Megahed

Heart Input Output, Inc. USA

IM01

Assoc. Prof.Jeongjin Lee

School of Computer Science & Engineering, Soongsil University, South Korea

IM02

Alexander Nikitin

Wargaming Inc., USA

ES01

Prof. Woo Hyun Ahn

Kwangwoon University, South Korea

Volunteer

Saturday, 27th July, 2019 **3A Room, Floor -2**

Prof. Sorush Niknamian

Board Member of Weston A Price Foundation.
PhD in Cell and Molecular Biology and Oncology, Military Medicine Dep., Liberty University, USA

Award Ceremony & Closing Ceremony

Saturday, 27th July, 2019	**17:40-18:10**	**3A Room, Floor -2**

Dinner Banquet

Saturday, 27th July, 2019	**18:10-19:10**	**Parnaso Restaurant, Floor 1**

Free day

Sunday, 28th July, 2019

Hope you'll enjoy your journey!

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Note

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