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Part I Conference Schedule

Time: November 12-14, 2021
Location: Xi'an Grand Dynasty Culture Hotel
西安古都文化大酒店

Date	Time	Location: Lobby, 1st floor
Nov. 12	14:00-17:00	**Registration**
Date	**Time**	**Location: Lishan Room (骊山厅), 1st Floor**
Nov. 13	08:30-12:00	**Keynote Speech Session** **Prof. Gordana Jovanovic Dolecek, Prof. Steven Guan,** **Prof. Theodoros Tsiftsis** **Chair: TBD** **Group Photo & Coffee Break: 09:50-10:10**
	12:00-13:30	**Lunch** Chinese Restaurant 中餐厅, 2nd Floor
Date	**Time**	**Location: Lishan Room (骊山厅), 1st Floor**
Nov. 13	14:00-18:00	**Technical Session** **Chair: TBD** **Group Photo & Coffee Break: 16:00-16:10**
	18:00-19:30	**Dinner** Chinese Restaurant 中餐厅, 2nd Floor

Part II   Keynote Speech

Keynote Speech Session

Keynote Speech 1: Design of Comb-Based Decimators for Sigma Delta Analog Digital Converters [video]

Speaker: Prof. Gordana Jovanovic Dolecek, Institute INAOE, Puebla, Mexico
Time: 08:30-09:10, Saturday Morning, November 13, 2021
Location: Lishan Room (骊山厅), 1st Floor, Xi'an Grand Dynasty Culture Hotel

Abstract
In oversampled Sigma Delta Analog Digital converters the signal is sampled by a rate which is much higher than Nyquist rate. However, at the output of the modulator, this rate should be decreased to a Nyquist rate. This process is called decimation. The process of decimation introduces aliasing which must be eliminated by a filter called antialiasing filter. The most simple antialiasing filter is comb filter which has all coefficients equal unity and consequently does not need multipliers for its implementation. There are two principal comb structures: recursive and no recursive. The recursive structure is an area efficient structure, while the no recursive structure is a power efficient structure. However, the magnitude characteristic of comb filter does not provide enough alias attenuations and additionally it has a droop in the passband which may deteriorate the decimated signal. Different methods have been proposed to improve comb aliasing rejection and decrease passband droop. We will present some the most popular methods to improve comb filter magnitude characteristic.

Keynote Speech 2: Opportunities and Challenges in Information Communications Technology

Speaker: Prof. Steven Guan, Xi'an Jiaotong-Liverpool University, China
Time: 09:10-09:50, Saturday Morning, November 13, 2021
Location: Lishan Room (骊山厅), 1st Floor, Xi'an Grand Dynasty Culture Hotel

Abstract
This talk introduces the overall trends of Information Communications Technology (ICT) and presents an overview for opportunities and challenges in ICT. Critical issues, research problems and developments of ICT in various areas are addressed, such

as green computing, Internet computing, mobile computing, and intelligent computing. Opportunities and challenges in relevant areas are also covered, for example, Internet of Things, cloud computing, big data analytics. Critical development of ICT in various aspects are proposed thereafter. Finally, the challenges faced by the higher education sector are also discussed.

Keynote Speech 3: Intelligent Metasurface-Assisted Communication for 6G Wireless Networks

Speaker: Prof. Theodoros Tsiftsis, Jinan University, Zhuhai Campus, Zhuhai, China
Time: 10:10-10:50, Saturday Morning, November 13, 2021
Location: Lishan Room (骊山厅), 1st Floor, Xi'an Grand Dynasty Culture Hotel

Abstract
Radio signal propagation via metamaterial-based intelligent surfaces has emerged recently as an attractive and smart solution to replace power-hungry active components. Such smart radio environments, that have the ability of transmitting data without generating new radio waves but reusing the same radio waves, can be implemented with the aid of reflective surfaces. This novel concept utilizes electromagnetically controllable metamaterial-based surfaces that can be integrated into the existing infrastructure, for example, along the walls of buildings. Such a surface is frequently referred to as Reconfigurable Intelligent Surface (RIS), Large Intelligent Surface (LIS) or Intelligent Reflective Surface (IRS). Its tunable and reconfigurable reflectors are made of passive or almost passive electromagnetic devices which exhibit a negligible energy consumption compared to the active elements or nodes. In this talk, we will highlight the state-of-the art of metasurface-based communications, basic communication theory, and promising applications in 6G wireless networks. Finally, a new a novel paradigm of metasurface shells able to increase the energy efficiency, energy harvesting and physical layer security will be presented.

Part III   Technical Session

Technical Session

Session Chair: TBD

Location: Lishan Room (骊山厅), 1st Floor   14:00-18:00, November 13, 2021

Time	Paper Title	Author	Affiliation
Oral	Countermeasure Against Deepfake Using Steganography and Facial Detection	Ye Zhu	Department of Electrical Engineering & Computer Science, Cleveland State University, Cleveland, OH, USA
Oral (Video)	The Factors Affecting Customer Satisfaction and Customer loyalty in Using Home Internet Service in Bangkok, Thailand	Jinming Duan	International College, University of the Thai Chamber of Commerce
Oral (Video)	The Factors Affecting Customer Satisfaction and Continuance Intention with Online Retailers' Application Service in Beijing, China	Bo Zhang	International College, University of the Thai Chamber of Commerce

Part IV　Technical Session Abstracts

ID: WiCOM2020_20003

Title: Axial Micro-Strain Sensor Based on FM-FBG via Dual-Mode ML-FMF in Sensor Networks*

Name: Xiao Liang

Affiliation: School of Information Engineering, Minzu University of China, Beijing, China

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Abstract

An in-fiber axial micro-strain sensor based on a Few Mode Fiber Bragg Grating (FM-FBG) is proposed and experimentally characterized. This FM-FBG is in inscribed in a multi-layer few-mode fiber (ML-FMF), and could acquire the change of the axial strain along fibers, which depends on the transmission dips. On account of the distinct dual-mode property, a good stability of this sensor is realized. The two transmission dips could have the different sensing behaviors. Both the propagation characteristics and operation principle of such a sensor are demonstrated in detail. High sensitivity of the FM-FBG, ~4 pm/$\mu\varepsilon$ and ~4.5 pm/$\mu\varepsilon$ within the range of 0 $\mu\varepsilon$-1456 $\mu\varepsilon$, is experimentally achieved. FM-FBGs could be easily scattered along one fiber. So this sensor may have a great potential of being used in sensor networks.

Keywords: micro-strain sensor, ML-FMF, dual-mode fiber, FM-FBG, sensor network

ID: WiCOM2020_20004

Title: Knowledge Tracking Model based on Learning Process

Name: Yu Zou

Affiliation: School of Information Engineering, Minzu University of China, Beijing, China

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Abstract

Knowledge tracking model has been a research hotspot in the field of educational data mining for a long time. Knowledge tracking can automatically discover students' weak knowledge points, which helps to improve students' self-motivation in learning and realize personalized guidance. The existing KT model has some shortcomings, such as the limitation of the calculation of knowledge growth, and the imperfect forgetting mechanism of the model. To this end, we proposed a new knowledge tracking model based on learning process (LPKT), LPKT applies the idea of Memory Augmented Neural Network (MANN). When we model the learning process of students, two additional important factors are considered. One is to consider the current state of knowledge of the students when updating the dynamic matrix of the neural network, and the other is to improve the forgetting mechanism of the model. In this paper we verified the effectiveness and superiority of LPKT through comparative experiments, and proved that the model can improve the effect of knowledge tracking and make the process of deep knowledge tracking easier to understand.

Keywords: Knowledge tracking, Deep learning, Memory Augmented Neural Network

ID: WiCOM2021_20001

Title: English Knowledge Points Extraction Based on SVM

Name: Jiayi Tang

Affiliation: School of Information Engineering, Minzu University of China, Beijing, China

Email: 1911377004@qq.com

Abstract

English is one of the key subjects of basic education in our country more and more students tend to learn English online. This paper takes middle school

English topics as the research object and proposes a method to extract the English knowledge points from the English tests based on SVM model. Through acquiring the corpus, preprocessing the corpus, and designing feature vectors based on English questions and knowledge points, this paper designs a hierarchical SVM knowledge point classifier to realize the knowledge point classification and extraction. Finally, the experimental results prove the proposed method is effective. It is of great significance to the standardization, automation and systematization of online education practice questions.

ID: WiCOM2021_20002
Title: The Automatic Question Generation System for CET*

Name: Xinya Zhang
Affiliation: School of Information Engineering, Minzu University of China, Beijing, China
Email: zxy98628@163.com

Abstract

In this paper, we apply the abstractive text summarization technology to automatic generation system of reading comprehension, which is part of College English Test (CET) in China. At present, there is a growing demand of English reading examination questions, yet the manual examination question generating is time-consuming and labor-intensive. To relieve the pressure on question generating task, we put the related automatic technology into application, which aims to assist teachers in question generating, meanwhile, to provide more CET exercises for students. We combine seq2seq model and attention mechanism to generate the abstractive text summarization. The abstract generated by this method is easy to understand and in line with the question generating of long reading comprehension, the experiment showed good results of question generating.

ID: WiCOM2021_20003
Title: Robust UAV Aided Data Collection for Energy-Efficient Wireless Sensor Network with Imperfect CSI

Name: Yi Cen
Affiliation: School of Information Engineering, Minzu University of China, Beijing, China
Email: yi_cen@126.com

Abstract

Due to its air superiority and high mobility, unmanned aerial vehicle (UAV) can obtain better line-of-sight (LoS) link transmission channel. Therefore, UAV assisted data collection for wireless sensor networks (WSNs) has become an important research direction. This paper intends to minimize the loss of WSNs for the robust data acquisition and communication assisted by UAV under the imperfect channel state information (CSI). On the premise of ensuring the completion of the communication task, we jointly optimize the wake-up schedule of SNs and the flight trajectory of the UAV, by considering the flight speed of the UAV and the sparse access of all sensor nodes (SNs) in WSN. Because the formulated optimization problem is a mixed integer nonconvex problem, we decompose the original problem into the efficient suboptimal solutions to overcome the difficulty of the optimization. Finally, the number of access node corresponding to the optimized operation time and access efficiency is induced for the entire WSN system efficiency improving. The simulation shows the performance gains of our proposed scheme and the influences of the system parameters are analyzed.

ID: WiCOM2021_20005
Title: Generation of Personalized Knowledge

Graphs Based on GCN

Name: Jiaya Liang

Affiliation: School of Information Engineering, Minzu University of China, Beijing, China

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Abstract

Education must follow the principle of teaching students in accordance with their aptitude. In this paper, we propose a novel method to generate personalized knowledge graphs based on graph convolutional network. We have summarized the methods of evaluating the difficulty of exercises, and apply them to the generation of knowledge graph. After that, the adjacency matrix corresponding to the knowledge graph and the eigenvectors corresponding to the nodes are used as inputs of the graph convolutional network, and the semi-supervised leaning node classification is adopted to continuously iterate the training to optimize the graph convolution neural network model. Meanwhile, the graph convolutional neural network is used to generate personalized knowledge graph for each student, more accurate personalized services can be provided. The experimental results show that our method can make a better to realize in-depth personalized services.

Keywords: Personalized Knowledge Graphs, Graph Convolutional Network, Personalized Learning

ID: WiCOM2021_20006

Title: Countermeasure Against Deepfake Using Steganography and Facial Detection

Name: Ye Zhu

Affiliation: Department of Electrical Engineering & Computer Science, Cleveland State University, Cleveland, OH, USA

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Abstract

As deepfake technology continues to advance at a rapid pace, there is a constant need to develop new methods to counteract its use. Physical copies of authentic items like signed baseball memorabilia use a certification to identify the authenticity. This paper proposes using steganography to embed a signed watermark inside a digital image. By using RSA to generate, sign, and verify the watermark, individuals will be able to authenticate personal images or try to verify signed images for authenticity. We evaluate the proposed approach with images manipulated by deepfake algorithms. The experiment results show 100% detection rate on deepfake images. The signing time and the verification time are around 300ms according to our experiments. So the overhead of the countermeasure are negligible.

Keywords: Deepfake, Deepfake Detection, Steganography, Cryptography, Facial Detection

ID: WiCOM2021_20007

Title: An End-to-end Method for Joint Extraction of Tibetan Entity Relations*

Name: Sisi Liu

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Abstract

Entity relation extraction is to find entities and relations from unstructured texts, which is beneficial to the applications of knowledge graphs and question answering systems. The traditional methods handle this task in a pipelined manner which extracts the entities first and then recognizes their relations. This framework may lead to error delivery. In order to tackle this problem, this paper proposes an end-to-end method for joint extraction of Tibetan entity relations which can extract entities and relations at the same time. According to the Tibetan spelling characteristics, this paper processes the Tibetan corpus by word-level and character-level respectively. Combined with part of speech tagging, we use the end-to-end model to convert the entity relation extraction task to the tagging problem. Finally, the experimental results show that the proposed method is better than the baseline.

Keywords: End-to-end model, Tibetan entity relation,

Joint method, Character-level processing

Title: Teaching Machines to Read and Comprehend Tibetan Text *
Name: Yuan Sun
Affiliation: School of Information Engineering, Minzu University of China, Beijing, China
Email: tracy.yuan.sun@gmail.com

Abstract
Teaching machine to comprehend a passage and answer corresponding questions, the machine reading comprehension (MRC) has attracted much attention in current years. However, most models are designed to finish English or Chinese MRC task, Considering lack of MRC dataset, the low-resource languages MRC tasks, such as Tibetan, it is hard to get high performance. To solve this problem, this paper constructs a span-style Tibetan MRC dataset named TibetanQA and proposes a hierarchical attention network model for Tibetan MRC task which includes word-level attention and re-read attention. And the experiments prove the effectiveness of our model.
Keywords: Machine reading comprehension, hierarchical attention, dataset

Title: On a Feature Extraction and Classification Study for PPG Signal Analysis
Name: Qian Wu
Affiliation: School of Information Engineering, Minzu University of China, Beijing, China
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Abstract
Photoplethysmography (PPG) is a low cost, non-invasive optical technology to detect the volumetric changes of blood circulation at the surface of skin. While the medical indication of components of PPG signals in the form of pulse wave are not yet fully understood, it is vastly agreed that they carry valuable pathophysiological information related to the cardiovascular system. Going beyond just dealing with frequency and time domain features of the pulse wave, as well as the first and second derivatives of the wave commonly seen in many of the relevant work, we applied a K-MEANS improved algorithm for feature extraction based on selected time domain parameters: K1 (systolic area), K2 (diastolic area) and K (entire pulse wave area). The extracted characteristic waveforms under the same light intensity could achieve average confidence level of 90% or higher. The stationary wavelet transform was adopted to further analyze the characteristic waveform by calculating the wavelet entropy; We then trained a Probability Neural Network (PNN) model using the wavelet entropy and other time domain characteristic parameters. It is found that the trained PNN model performs well in analyzing characteristic waveform to distinguish between health condition and severe arterial stenosis.
Keywords: PPG Pulse Wave, K-MEANS, Stationary Wavelet Transform, Wavelet Entropy, Probability Neural Network (PNN)

Title: The Factors Affecting Customer Satisfaction and Customer loyalty in Using Home Internet Service in Bangkok, Thailand
Name: Jinming Duan
Affiliation: International College, University of the Thai Chamber of Commerce
Email: 190757142@qq.com

Abstract
Recently, Bangkok customers are faced with the situation of choosing the best home internet service that many companies provide. Furthermore, the firms providing residential Internet services also confront the scenario to satisfy the consumer to expand the market share. Internet managers should thus be aware of the elements that influence customer satisfaction and customer loyalty while developing these strong ties. Product-satisfied consumers are likely to be

positive in terms of frequent purchases, larger purchases and purchases of the other items and services the firm offers [1].

In this research, it found that the top three internet service companies of Bangkok are TRUE, AIS and 3BB. The market share of the three companies is 37.3%, 25.0%, 21.5%. The top three company's market share almost 83.8%, so these three companies need to know how to keep the market share, which means these companies need to know how to keep the customer loyalty. From this research, it found that for keep the customer loyalty, the company need the increase the customer image and customer satisfaction, they should focus on how to ensure that a client feels it is worthy of choice to purchase their Internet service compared to other internet companies and saves customers time and effort. The market share of TOT and other company is respectively 14.2% and 1.0%. These companies TOT and other brand, they need to know how to compete with others and get more market share. They need to understand what regions are needed to attract more clients and develop their loyal client base. From this research, Firstly, these companies need to change their service quality which include the empathy, assurance network quality, tangibility, reliability and responsiveness. Secondly, these companies need to change their corporate image better. When the customer gets more satisfaction, they will get more market share.

Keywords: Customer Satisfaction, Service Quality, Customer Loyalty, Corporate Image

Reference:

[1] Anderson, EW, Fornell, C & Lehmann, DR 1994, 'Customer Satisfaction, Market Share, and Profitability: Findings from Sweden', Journal of Marketing, vol. 58, no. 3, July, pp. 53 - 66. https://doi.org/10.1177/002224299405800304

Title: The Factors Affecting Customer Satisfaction and Continuance Intention with Online Retailers' Application Service in Beijing, China

Name: Bo Zhang
Affiliation: International College, University of the Thai Chamber of Commerce
Email: susiezhangbo@foxmail.com

Abstract

Nowadays, customers are facing the situation how to make a decision of choosing the best applications for shopping which were provided by many online retailers. On the other hand, online retailers are also confronted with the situation how to satisfy customers in order to attract customers to purchase with their apps continuously.

Many studies have done on finding customers' online shopping behavior using websites, few has done on shopping applications. Therefore, this study aims to study which factors can affect customers' continuance intention to use online shopping applications, they are perceived usefulness, perceived ease of use, confirmation, and customer satisfaction.

Keywords: Customer Satisfaction, Continuance Intention, Online Retailers, Application

Part V Instructions for Presentations

Oral Presentation

Devices Provided by the Conference Organizing Committee:

- Laptops (with MS-office & Adobe Reader)
- Projectors & Screen
- Laser pointer

Materials Provided by the Presenters:

- PowerPoint or PDF files

Duration of each Presentation:

- Regular Oral Session: 10-15 Minutes of Oral Presentation
- Keynote Speech: 40-45 Minutes of Keynote Speech

Poster Presentation

Materials Provided by the Conference Organizing Committee:

- X Racks & Base Fabric Canvases (60cm×160cm, see the figure below)
- Adhesive Tapes or Clamps

Materials Provided by the Presenters:

- Home-made Posters

Requirement for the Posters:

- Material: not limited, can be posted on the Canvases
- Size: smaller than 60cm×160cm
- Content: for demonstration of the presenter's paper

Part VI   Hotel Information

About Hotel

The Grand Dynasty Culture Hotel (西安古都文化大酒店) is ideally located in the city center near several major Xi'an attractions. All 464 guestrooms in this Xi'an hotel feature modern amenities including large screen TV's, mini-bars and 24-hour room service. The hotel's restaurant serves a variety of Asian and Western delicacies, and a bar/lounge caters for after dinner drinks. Conference rooms at the business center are equipped with audiovisual facilities as well as all necessary amenities for an efficient office environment away from home. In terms of recreation, the hotel offers a fully-equipped gymnasium and a tennis court for active guests, along with an indoor swimming pool, steam room and sauna for guests seeking something a little more relaxed.

Address: No.172 Lianhu Road, Lianhu District, Xi'an, China

陕西省西安市莲湖区莲湖路172号

Post code: 710002

Tel: +86-029-87216868

How to Get to the Hotel

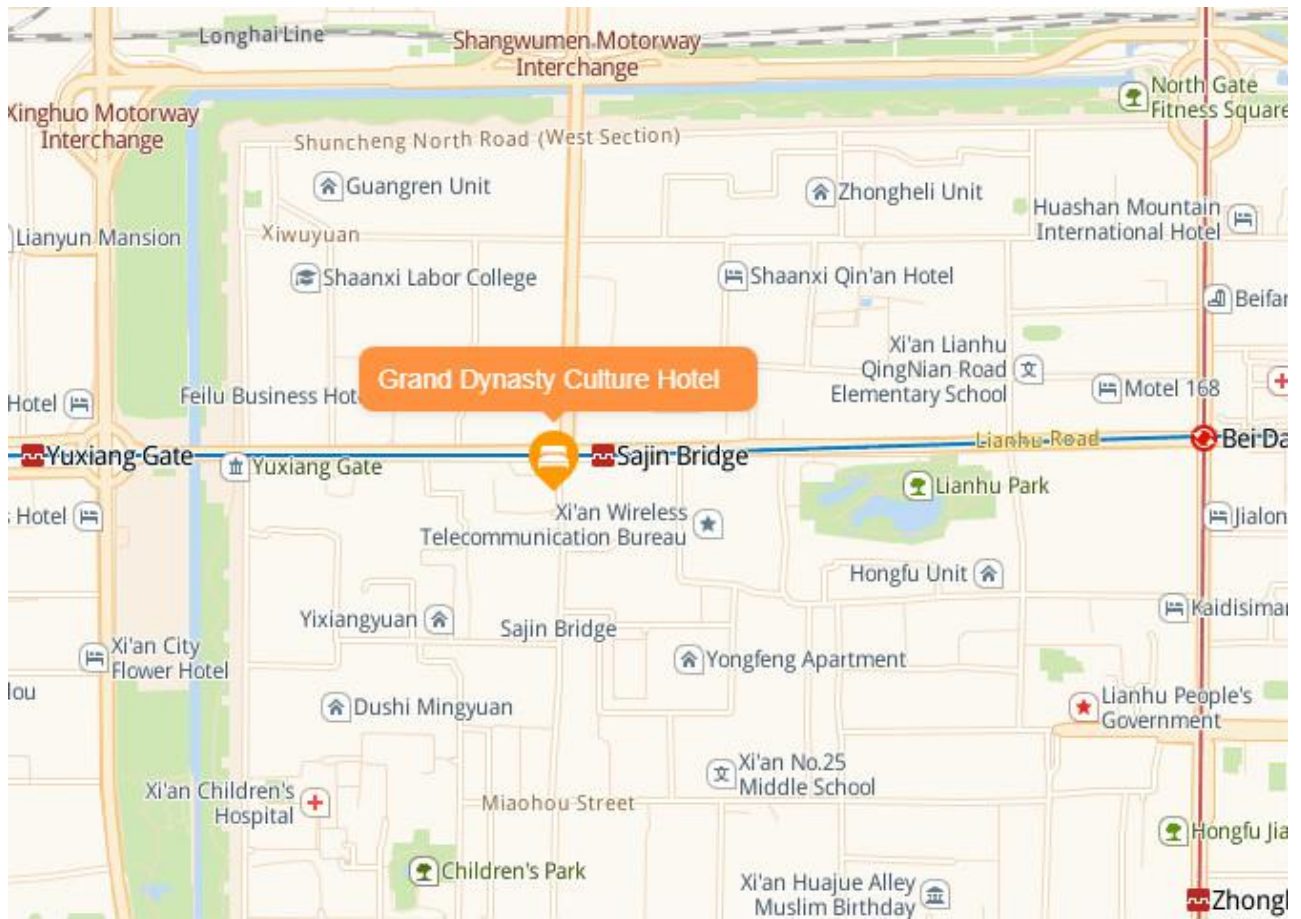Xi'an Xianyang International Airport: 34.15km

咸阳国际机场：全程约34.15公里，打车费约95元

Xi'an Railway Station: 3.75km

西安火车站：全程约3.75公里，打车费约11元

Line 1 Metro Station Sajinqiao: 0.24km

For authors who do not understand Chinese, please show the following info to the

driver if you take a taxi:

请送我到：陕西省西安市莲湖区莲湖路172号　　西安古都文化大酒店

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