The 14th International Conference on Computer Science & Education
(ICCSE 2019)
August 19 – 21. Toronto, Canada.

Final Program & Book of Abstracts

	Organized by	National Research Council of Computer Education in Colleges & Universities, China
OntarioTech UNIVERSITY	**Hosted by**	Ontario Tech University, Canada
	Technical Sponsorship	IEEE Education Society

ICCSE 2019
The 14th International Conference on Computer Science and Education

Final Program & Book of Abstracts

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Welcome to ICCSE

On behalf of the IEEE ICCSE 2019 organizing committee, I am honored and delighted to welcome you to the 14th International Conference on Computer Science and Education (ICCSE 2019) at Ontario Tech University, Canada. ICCSE is a series of annual conference, which began in 2006 in Xiamen, China. The Conference provides an international forum for presenting the most recent advances in the fields of Computer Science, Education, and related areas of Engineering and Advanced Technologies. Also, the Conference facilitates and promotes information exchange among participants from industry, research laboratories, and academia.

The 14th International Conference on Computer Science & Education (ICCSE 2019) will be held in Toronto, Canada on August 19-21, 2019. The conference is organized by the China Research Council of Computer Education in Colleges & Universities (CRC-CE), hosted by Ontario Tech University, and technical supported by the IEEE Education Society. The proceedings of ICCSE 2019 will be published by IEEE, and be included in IEEE Xplore digital library. The main topic of ICCSE 2019 "Benefiting from Collaborative Education and Research". Topics of this year's conference will be focused on Mechatronics, Data Science, Computer Science as well as their applications in education practices and e-society areas. ICCSE 2019 will bring together professors, experts, professionals and researchers from universities, research institutes and related industries to share new research results, ideas and new perspectives on a wide range of Computer Science, especially AI, Education, Data Science and engineering by addressing frontier technical and business issues essential to applications of data science in both higher education and advancing people's life.

Our technical program is rich and varied with 3 keynote speeches:
Instrumentation and Design of a Mechatronic System—Relationship and Procedures from Prof. Clarence W. de Silva, P.Eng., ASME Fellow, IEEE Fellow, and Fellow of Canadian Academy of Engineering, Fellow of Royal Society of Canada, Professor of Mechanical Engineering, Department of Mechanical Engineering, the University of British Columbia, Canada; Autonomous Driving: Simulation and Navigation from Prof. Professor Dinesh Manocha, AAAI Fellow, IEEE Fellow, Professor of Computer Science and Engineering, University of Maryland, USA; Computational Topology in Shape and Data Analysis from professor Tamal Krishna Dey, ACM Fellow, IEEE Fellow, Professor of Department of Computer Science and Engineering, The Ohio State University USA. 4 invited sessions, 2 best paper sessions, 6 oral sessions and poster sessions are included and 211 technical papers will be presented.

The success of our conference depends on the many people who have worked with us in planning and organizing the technical program and supporting social arrangements all over the world. In particular, we thank program chairs for their wise advices and suggestions on organizing conference technical

program; we thank the conference organizing committee members who have all worked extremely hard for the details and activities of this conference. We are looking forward to meeting you in Canada!

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General Information

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Prof. Clarence de Silva, Department of Mechanical Engineering, The University of British Columbia, Canada
Prof. Tarlochan Sidhu, Ontario Tech University, Canada

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Prof. Lang Haoxiang, Ontario Tech University, Canada

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Prof. Shahryar Rahnamayan, Ontario Tech University, Canada
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Prof. Lin Xianke, Ontario Tech University, Canada

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Dr. Xi Chunyan, Computer Education Press, China
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Mr. Aaron Tan, Faculty of Engineering and Applied Science, Ontario Tech University, Canada
Mr. Matthew Levins, Faculty of Engineering and Applied Science, Ontario Tech University, Canada
Mr. Abdulrahman Al-Shanoon, Faculty of Engineering and Applied Science, Ontario Tech University, Canada

Keynote Speech I

Instrumentation and Design of a Mechatronic System—Relationship and Procedures

Prof. Clarence W. de Silva

Mechanical Engineering, University of British Columbia, Canada

Abstract

This talk concerns instrumenting and design of a mechatronic system, and addresses their relationship and procedures. The instrumentation is done through the incorporation of suitable sensors, actuators, controllers, and other required hardware. Sensors (e.g., semiconductor strain gauges, tachometers, RTD temperature sensors, cameras, piezoelectric accelerometers) are needed to measure (sense) unknown signals and parameters of a system and its environment. The information acquired in this manner is useful in operating or controlling the system, and also in process monitoring; experimental modeling (i.e., model identification); product testing and qualification; product quality assessment; fault prediction, detection and diagnosis; warning generation; surveillance, and so on. Actuators (e.g., stepper motors, solenoids, dc motors, hydraulic rams, pumps, heaters/coolers) are needed to "drive" a plant. Control actuators (e.g., control valves) perform control actions, and in particular they drive control devices. Micro-electromechanical systems (MEMS) use microminiature sensors and actuators. MEMS sensors commonly use piezoelectric, capacitive, electromagnetic and piezoresistive principles. MEMS devices provide the benefits of small size and light weight (negligible loading errors), high speed (high bandwidth), and convenient mass-production (low cost). The process of instrumentation involves the identification of proper sensors, actuators, controllers, and signal modification/interface hardware, and software with respect to their functions, operation, parameters, ratings, and interaction with each other, so as to achieve the performance requirements of the overall system, and interfacing/integration/tuning of the selected devices into the system, for a given application. Design leads to building a system that meets a set of performance requirements, starting with basic components such as sensors, actuators, controllers, signal modification devices. This involves instrumentation of the system, which is needed in achieving the design objectives. This talk presents the key steps of design and instrumentation of a mechatronic system, in a somewhat general and systematic manner. Examples are described to illustrate several key procedures of instrumentation, and in parallel the key steps of design, of a mechatronic system. The commonalities and the complementary nature of these steps are highlighted.

Speaker Biography

Prof. Clarence W. de Silva, P.Eng.
ASME Fellow, IEEE Fellow
Fellow of Canadian Academy of Engineering
Fellow of Royal Society of Canada
The Academy of Science of the Royal Society of Canada
Professor of Mechanical Engineering
Department of Mechanical Engineering
The University of British Columbia, Canada

Academic Qualifications:

Ph.D., Massachusetts Institute of Technology, USA, 1978
Ph.D., University of Cambridge, England, 1998
D.Eng. (Honorary), University of Waterloo, Canada, 2008

Appointments:

Senior Canada Research Chair in Mechatronics and Industrial Automation,
Professorial Fellow
Peter Wall Scholar
NSERC-BC Packers Professor of Industrial Automation
Mobil Endowed Chair Professor
Honorary Chair Professor

Awards:

Paynter Outstanding Investigator Award and Takahashi Education Award, ASME Dynamic Systems & Control Division; Killam Research Prize; Outstanding Engineering Educator Award, IEEE Canada; Lifetime Achievement Award, World Automation Congress; IEEE Third Millennium Medal; Meritorious Achievement Award, Association of Professional Engineers of BC; Outstanding Contribution Award, IEEE Systems, Man, and Cybernetics Society.

Fellowships:

Lilly Fellow; NASA-ASEE Fellow; Senior Fulbright Fellow to Cambridge University; Distinguished Visiting Fellow of Royal Academy of Engineering; Fellow of the Advanced Systems Institute of BC; Killam Fellow; Erskine Fellow.

Editorial Boards:

14 journals including IEEE Trans. Control System Technology and ASME Journal of Dynamic Systems, Measurement & Control; Editor-in-Chief, International Journal of Control and Intelligent Systems; Editor-in-Chief, International Journal of Knowledge-Based Intelligent Engineering Systems; Senior Technical Editor, Measurements and Control; Regional Editor, North America, Engineering Applications of Artificial Intelligence—IFAC International Journal of Intelligent Real-Time Automation; and Management Committee, IEEE-ASME Transaction in Mechatronics.

Publications:

24 technical books, 19 edited books, 51 book chapters, 250 journal articles, and 275 conference papers.

See *http://ial.mech.ubc.ca/*

Keynote Speech II

Autonomous Driving: Simulation and Navigation

Prof. Dinesh Manocha
Computer Science and Engineering, University of Maryland, USA

Abstract

Autonomous driving has been an active area of research and development over the last decade. Despite considerable progress, there are many open challenges including automated driving in dense and urban scenes. In this talk, we give an overview of our recent work on simulation and navigation technologies for autonomous vehicles. We present a novel simulator, AutonoVi-Sim, that uses recent developments in physics-based simulation, robot motion planning, game engines, and behavior modeling. We describe novel methods for interactive simulation of multiple vehicles with unique steering or acceleration limits taking into account vehicle dynamics constraints. In addition, AutonoVi-Sim supports navigation for non-vehicle traffic participants such as cyclists and pedestrians AutonoVi-Sim also facilitates data analysis, allowing for capturing video from the vehicle's perspective, exporting sensor data such as relative positions of other traffic participants, camera data for a specific sensor, and detection and classification results. We highlight its performance in traffic and driving scenarios. We also present novel multi-agent simulation algorithms using reciprocal velocity obstacles that can model the behavior and trajectories of different traffic agents in dense scenarios, including cars, buses, bicycles and pedestrians. We also present novel methods for extracting trajectories from videos and use them for behavior modeling and safe navigation.

Speaker Biography

Prof. Dinesh Manocha
AAAI Fellow, IEEE Fellow
Professor of Computer Science and Engineering
The University of Maryland, USA

Academic Qualifications:

Ph.D., University of California at Berkeley, CA, 1992
B. Tech, Indian Institute of Technology, Delhi, India, 1987

Research Interests:

Autonomous driving, AI and Robotics, Graphics Visualization and VR AR, High Performance and Scientific Computing

Awards:

Distinguished Faculty Award, Facebook; Pioneer, Solid Modelling Association; SIGGRAPH Academy， ACM; Distinguished Career in Computer Science, Washington Academy of Sciences; Alibaba Innovation Award; IEEE Test of Time Award Paper Nominee, Conf. on Robotics and Automation; Google DayDream Faculty Award; Google Faculty Research Award; IIT Delhi Distinguished Alumni Award; IBM Smarter Planet Innovation Award; ACM Fellow For contributions to geometric computing and applications to computer graphics, robotics and GPU computing, etc.

Prof. Dinesh Manocha is the Paul Chrisman Iribe Chair in Computer Science & Electrical and Computer Engineering at the University of Maryland College Park. He is also the Phi Delta Theta/Matthew Mason Distinguished Professor Emeritus of Computer Science at the University of North Carolina - Chapel Hill. He has won many awards, including Alfred P. Sloan Research Fellow, the NSF Career Award, the ONR Young Investigator Award, and the Hettleman Prize for scholarly achievement. His research interests include multi-agent simulation, virtual environments,

physically-based modeling, and robotics. He has published more than 500 papers and supervised more than 36 PhD dissertations. He is an inventor of 9 patents, several of which have been licensed to industry. His work has been covered by the New York Times, NPR, Boston Globe, Washington Post, ZDNet, as well as DARPA Legacy Press Release. He was a co-founder of Impulsonic, a developer of physics-based audio simulation technologies, which was acquired by Valve Inc. He is a Fellow of AAAI, AAAS, ACM, and IEEE and also received the Distinguished Alumni Award from IIT Delhi. He is a member of ACM SIGGRAPH Academy and a Pioneer of Solid Modeling Association.

See *http://www.cs.umd.edu/~dm*

Keynote Speech III

Computational Topology in Shape and Data Analysis

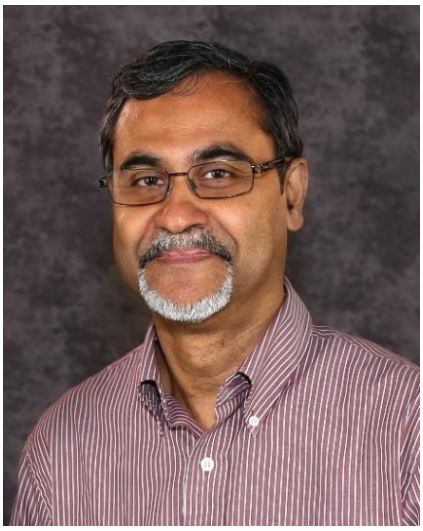
Prof. Tamal K. Dey

Computer Science and Engineering, The Ohio State University USA

Abstract

Many applications involving shapes and data not only require analyzing and processing their geometries, but also associated topologies. In the past two decades, computational topology, an area rekindled by computational geometry has emphasized processing and exploiting topological structures of shapes and data. The understanding of topological structures in the context of computations has resulted into sound algorithms and has also put a thrust in developing further synergy between mathematics and computations in general. This talk aims to delineate this perspective by considering some applications shape and data analysis, namely, (i) surface/manifold reconstructions, (ii) mesh generation, and (iii) topological data analysis for which computational topology has played a crucial role. For each of the three topics, we will emphasize the role of topology, state some of the key results, and indicate open questions/problems. The hope is that the talk will further stimulate the interest in tying topology and computation together in the larger context of data science.

Speaker Biography



Prof. Tamal Krishna Dey
ACM Fellow, IEEE Fellow
Department of Computer Science and Engineering
The Ohio State University, USA

Academic Qualifications:

Ph.D, Purdue University, 1991

Research Interests:

Computational Geometry, Computational Topology and their applications to Geometric modeling, Data analysis

Prof. Tamal K. Dey is a professor of computer science at the Ohio State University where he is currently serving as the Interim Chair of the CSE department. His research interest includes computational geometry, computational topology and their applications to geometric modeling and data analysis. He finished his PhD from Purdue University in 1991. Prior to joining OSU, he held academic positions at University of Illinois at Urbana Champaign, Indiana University-Purdue University at Indianapolis, Indian Institute of Technology, Kharagpur, India, and Max-Planck Institute, Germany. He has (co)authored two books, "Curve and surface reconstruction: Algorithms with Mathematical Analysis", published by Cambridge University Press and "Delaunay Mesh Generation" published by CRC Press. (Co)author of more than 200 scientific articles, Dey is an IEEE and ACM Fellow. He serves in various editorial and executive boards and routinely gives invited lectures at various academic forums. He leads the Jyamiti research group at OSU and heads the recent NSF sponsored TRIPODS Phase I Institute at OSU.

See *https://web.cse.ohio-state.edu/~dey.8*

The Working Group on Computer Assisted Learning for English Speech

ICCSE 2019 Workshop on English Language Pronunciation and English Speech

Dr. Sena Seneviratne
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Dr. Judith Beveridge
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Toronto, Canada
noelw@sciteqsoft.net

Mrs. Daisy Herft
Retired Graduate English teacher whose vernacular tongue is English, 9B-89-6, Mattegoda Housing Scheme, Mattegoda, Sri Lanka.

Abstract
The objective of the Working Group is to conduct research to find ways to enable adults to easily learn English speech and become fluent in spoken English. Adult learners should know the basics of English grammar, and that means how to write simple English sentences without grammatical errors. The Working Group focuses mainly on how to develop computer software packages to train the learners in English speech. The sole objective of the Interactive Software Packages is to train foreign learners to speak English fluently (correctly, continuously and smoothly). This means, their main focus is to train the learners to apply stress correctly and sufficiently on each English word and phrase.

9: 45-10:00: **Registration**

10.00-10:30: **Inauguration/ Opening**

10.30-11:00: **Special Introduction about the course** by Dr. Sena Seneviratne (English poet and the former Research Associate, School of Electrical and Information Engineering and School of English, Sydney University)

11:00-12:30: **Introduction and distribution of the Workshop Course Book and Audio records namely "English Language Pronunciation and English Speech"** by Dr. Sena Seneviratne. The course book is published in Australia in July 2019)

(From the chapters 1-6)

Details:

Introduction of English Alphabet with their relevant sounds,
Introduction of International Phonetic Alphabet (IPA),
Usage of learner's vernacular tongue to learn English sounds instead of IPA (egg: Mandarin, Japanese, Hindi, Sri Lankan),

Peculiarities of the Phonetics,
A discussion on the pronunciation and speech practice using basic 12 vowel sounds of English with examples (IPA/ learner's mother tongue)
Usage of sound "i" in English Speech
Usage of sound "ɪ" in English Speech
Usage of sound "e" in English Speech
Usage of the sound "æ" in English Speech

12:30-13:30: **Lunch break**

13:30-15:00: **To follow the course book (English Language Pronunciation and English Speech)** by Dr. Sena Seneviratne.

(From the chapters 7-16)

Details:

A discussion on singular and plural nouns, root and 3rd person verbs,
A discussion on the pronunciation and speech practice using basic 12 vowel sounds of English with examples (IPA/ learner's mother tongue) (Continues):
Usage of sound "ɑ", "ɔ", "ɔ:", "u", "u:", "ʌ", "ə" and "ə:" in English Speech
A discussion on the pronunciation and speech practice using 8 diphthongs ("ei", "ou", "ai", "au", "oi", "i ə", "eə " and "uə ") of English with examples (IPA/ learner's mother tongue),
A discussion on pronunciation and speech practice using other special sounds with examples (IPA/ learner's mother tongue),
Rules for the usage of sound for words ending with phonemes "g", "tʃ", "dʒ", "ŋ", "f", "v", "ɵ" and "t" in English Speech,
Rules for the usage of sound for words ending with letters "et", "less", "ness" and "age",
Rules for words ending with letters "z" or "s" where "Z" sound is applied/ not applied,
What are the other illogical and strange pronunciations of English words?

15:00-15:30: **Tea break**

15:30-16:30: **How to make your English speech perfect (from English Language Pronunciation and English Speech)** by Mr. Noel Wijesingha/ Dr. Sena Seneviratne.

(From the chapters 17 and 18)

Details:

Difference between syllable-time language (Mandarin) and stress-time English language,
A discussion on the correct application of stress on the syllables of English words,
Some rules on application of correct levels of stress on syllables of English words and sentences and maintaining the correct English accent.

16:30-17:30: **How to use Computer Software Tools effectively in the learning of correct speech. Computer Assisted Language Learning (CALL)** by Prof. Liyanage C. De Silva/ Dr Sena Seneviratne/ Mr. Noel Wijesingha

(From the Chapter 19)

Details:

Computer Assisted Language Learning for Syllable-time Language Exposed Adults who are Learning a new Stress-Time Language.
How to get the help of Computer Software Tools to improve your correct application of stress on English words and sentences.
Benchmarking the current university research on developing such Computer Software Tools.
A discussion on good software tools in the market
A demonstration on the effective usage of a software tool
Without a teacher, a learner can improve the pronunciation of words and sentences. In the learning process, a learner can compare his level of pronunciation with that of a native English speaker.

17:30-18:00: **A discussion about the future directions**
With an emphasis on the new research on Computer Software Tools

Invited Sessions

1. Smart Mechatronics and Robotics Systems

Chair:

Dr. Wang Ying
Kennesaw State University, USA
ying.wang@kennesaw.edu

Co-chair:

Dr. Clarence W. de Silva
University of British Columbia, Canada
desilva@mech.ubc.ca

Abstract

In the past years, smart mechatronics and robotics systems have attracted more attentions because machine learning, computer vision and advanced controls are usually integrated together in these systems that show more flexible and intelligent behaviors. For promoting the development of smart mechatronics and robotics systems, the ICCSE conference is held on August 19 to 21, 2018. This session is intended to provide a forum for colleagues in smart mechatronics and robotics areas to share their experiences and new research achievements. Topics are included but not limited to:

- Intelligent robots and mechatronics products
- Autonomous vehicles or robots
- Machine learning applications in robotics
- Vision based robotic or mechatronics systems
- Advanced control of autonomous robots or self-driving vehicles
- Deep learning and neural network technologies

2. VR, AR, and MR technologies in Higher Education

Chair:

Prof. Carsten Lecon
Aalen University, Germany
c.lecon@web.de

Abstract

Virtual 3D worlds are not only used for the visualization of complex learning matters, but get increasing importance in learning environments. Students for example act as avatars in artificially generated worlds, in which they learn, develop, and present simultaneously. Full immersion is possible by so called head mounted displays, for example the HTV Vive or the Oculus Rift. Nowadays, these are less expensive, so that many users can use this technique. Furthermore, Augmented Reality (AR) und Mixed Reality (MR) applications become more and more important in industrial application – and also in learning environments. Topics are included but not limited to:

- Virtual 3D spaces for collaborative learning
- Teaching VR/ AR/ MR techniques in Higher Education
- Didactic and pedagogical aspects when designing VR/ AR/ MR applications
- Kinetosis in VR environments
- Evaluation of AR/ VR / MR applications

3. Technology-Inspired Smart Learning

Chair:

Prof. Zheng Li
Tsinghua University, Beijing, China
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Co-Chair:

A. P. Li Chao
Tsinghua University, Beijing, China
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Abstract

Smart learning environments are very diverse: massive open online courses with AI assistants, intelligent tutoring systems, interactive learning courseware, learning games, collaborative programming communities, community tutorial systems, personalized exercise programs, tutoring robotics are all examples, especially in off-campus scenarios. A growing number of current campus-based courses in popular fields are also involved. All share a common purpose to increase human potential, leveraging data collection, data analysis, human interaction, and varying forms of computational assessment, adaptation and guidance.

Information technologies have been proposed to the modern smart learning space, but may instead increase the digital divide if applied without reflection. So, further work is needed to understand how to leverage technologies to provide equitable education for all, and many questions remain to be answered. What are the main barriers to providing educational opportunities to underserved teachers and learners? How can AI and advanced technologies help overcome these difficulties? How can this work be done ethically? etc. In this session we gather the collective intelligence of the community to provide innovative and creative solutions, thus try to investigate "Technology-Inspired Smart Learning".

This session solicits original research paper submissions on methodologies, case studies, analyses, tools, or technologies for smart learning, broadly construed. Four kinds of contributions will be accepted: Research Papers, Synthesis/Review Papers, Work-in-Progress Short Papers, and Demonstrations. Topics are included but not limited to:

- Knowledge graph for education
- Big data for learning
- Block chain supported platforms
- Tutoring robotics
- AI assistants/supports
- Interactive/personalized exercise games/systems
- Collaborative programming study tools/integrated platforms
- Information technology standards for education

4. *Innovative talent cultivation under the college-enterprise collaborative model*

Chair:

Prof. Zhao Huan
Hunan University
hzhao@hnu.edu.cn

Co-Chair:

Prof. Luo Juan
Hunan University
juanluo@hnu.edu.cn

Co-Chair:

A.P. Li Xiaoying
Hunan University
lixy@hnu.edu.cn

Abstract

Innovative talent cultivation is an eternal subject to be studied in the training of talents in colleges and universities. Cultivating innovative talents involves talent training concepts, standards, education systems, evaluation systems, policy systems, curriculum, teaching materials and innovation platform construction and other aspects. The core point of these contents is to improve the ability of university personnel training, the key will be focused on teachers. This session is intended to provide a forum for colleagues from the academic and industry to exchange experience and achievements related to the innovative talent cultivation under the cooperation of college and enterprise. Topics are included but not limited to:

- Exploration and practice of curriculum system construction for innovative talent cultivation.
- AI for the training mode of innovative talents
- Education and teaching means, tools and systems based on new IT.
- The Innovative and Practical Education

General Conference Information

The 14th International Conference on Computer Science & Education (ICCSE 2019) will be held at Ontario Tech University, Toronto, Canada on August 19-21, 2019. The conference is organized by the executive committee of ICCSE 2019, and National Research Council of Computer Education in Colleges & Universities, China (CRC-CE).

1. Language

The official language of the conference is English.

2. Conference Venue

32 Commencement Drive, Oshawa, Ontario, Canada L1G 8G3M
Tel: +1-905-728-8700
Fax: +1- 905-721-3152
E-mail: oshawa@stayrcc.com
Website: www.stayrcc.com/oshawa

3. Conference Hotel

Participants are strongly recommended to reserve the room in the same place (conference venue). Please directly contact the Residence & Conference Centre- Oshawa online for the special ICCSE 2019 discounted rate:

The Residence & Conference Centre – Oshawa
32 Commencement Drive, Oshawa, Ontario, Canada L1G 8G3M
Tel: +1-905-728-8700
Fax:+1- 905-721-3152
E-mail: oshawa@stayrcc.com
Website: www.stayrcc.com/oshawa
GROUP NAME: 2019 ICCSE Conference
DATES: August 19-21, 2019 *Group rate available from August 18-22, 2019

Details can be found in "**Information about Conference Venue**".

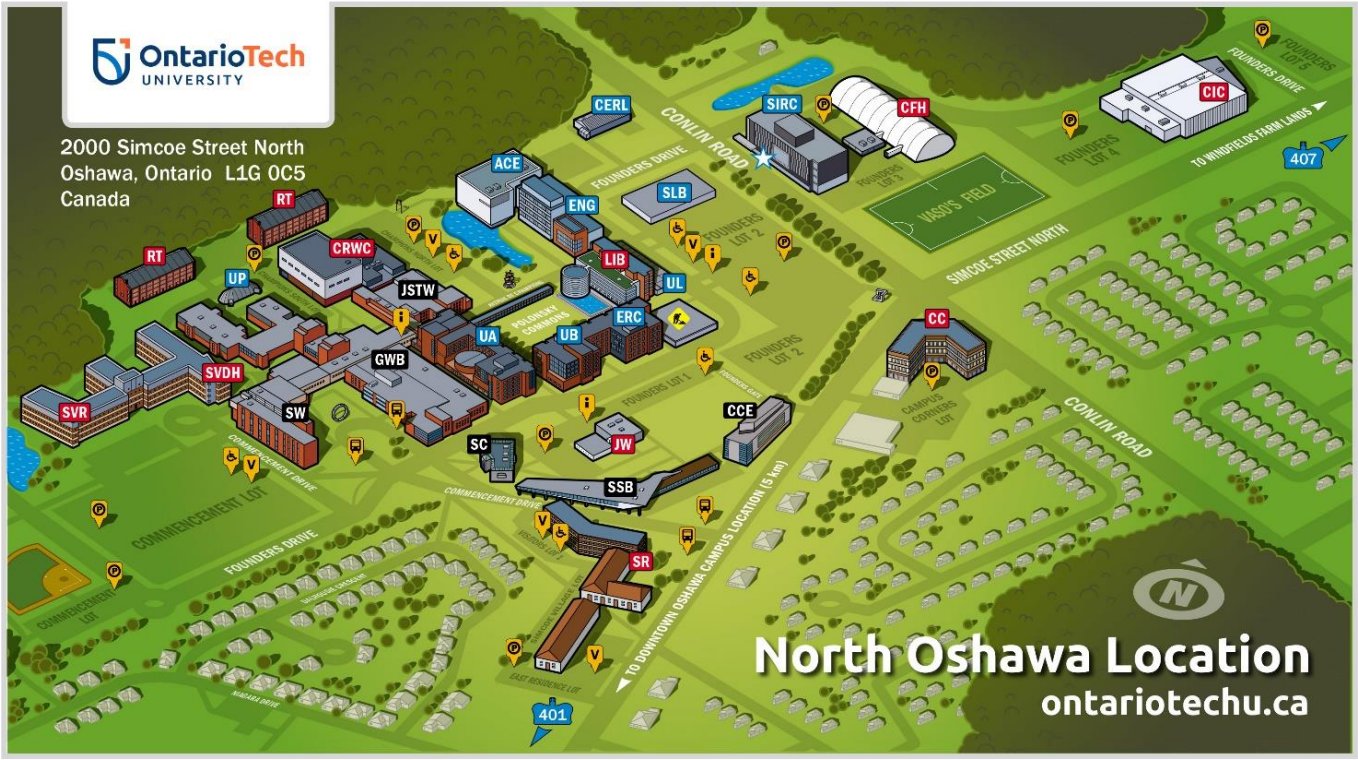
4. Onsite Registration Hours and Location

Date: August 18, 2019 (Sunday)

Time: 16:00-20:00 pm

Venue: UA Atrium

Location Map
(Conference Venue)



- Ontario Tech University buildings
- Durham College buildings
- Shared buildings
- Parking
- Accessible parking
- Visitors' parking
- Information
- Bus stops
- Under construction

- ACE ACE
- CC Campus Corners
- CCE Centre for Collaborative Education
- CERL Clean Energy Research Lab
- CFH Campus Fieldhouse
- CIC Campus Ice Centre
- CRWC Campus Recreation and Wellness Centre
- ENG Ontario Power Generation Engineering Building
- ERC Energy Systems and Nuclear Science Research Centre
- GWB Gordon Willey Building
- JW J Wing
- JSTW Justice Wing
- LIB Library
- RT Residence Townhouses
- SC Student Centre
- SIRC Software and Informatics Research Centre
- ☆ Office of the Registrar
- SLB Student Life Building
- SR Simcoe Village Residence
- SSB Student Services Building
- SVDH South Village Dining Hall
- SVR South Village Residence
- SW South Wing
- UA Science Building
- UB Business and Information Technology Building
- UL Classrooms
- UP Pavilion

If you require an alternative format of this information, contact marketing@uoit.ca.

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5. Conference Meals

Date: **August 20, 2019** (Tuesday)
19:00-22:00 Banquet (Leave for Banquet: 18:30)
Lunch is provided on **August 20-21, 2019** (Tuesday, Wednesday)
Lunch time: 12:30-13:30
UA Atrium

Information about Conference Venue

Residence & Conference Centre – Oshawa Located on the Campus of Durham College and UOIT Durham College and UOIT is a SMOKE-FREE CAMPUS

(A) 32 Commencement Drive, Oshawa, Ontario, Canada L1G 8G3

(T) 905-728-8700

(F) 905-721-3152

(E) oshawa@stayrcc.com

(W) www.stayrcc.com/oshawa

GROUP NAME: 2019 ICCSE Conference

DATES: August 19-21, 2019

*Group rate available from August 18-22, 2019

ACCOMMODATIONS:

- South Village Residence – Two Bedroom Suites

Each of our suites consists of the following:

- Private Two bedrooms:
  - Each bedroom consists of one double bed, one desk
  - Kitchenette: equipped with a bar sized fridge, sink and microwave
  - Three-piece washroom • Television, wireless internet, parking and local calling are all included
  - Each suite has control over the temperature in the unit

RATE: $74.95/night + HST (13% tax)

Instructions to book online:

Availability will only be on a first come, first serve basis. Please encourage your group members to book quickly

1. To book online: https://app.thebookingbutton.com/properties/oshawadirect

• Enter both the arrival and departure dates

- Within the Promotional Code Box enter Promo Code **ICCSE8370** and click Apply
- After, proceed to Click - Show Rates
- Once the rate appears click Book to Reserve

2. Please make reservations by Friday, August 2, 2019. If guests have not booked a room by the indicated date, the discounted rate will no longer be available.

Instructions to book by phone: 1. To reserve by phone, call us at 905-728-8700 ext. 8000 and reference the Promo Code: ICCSE8370

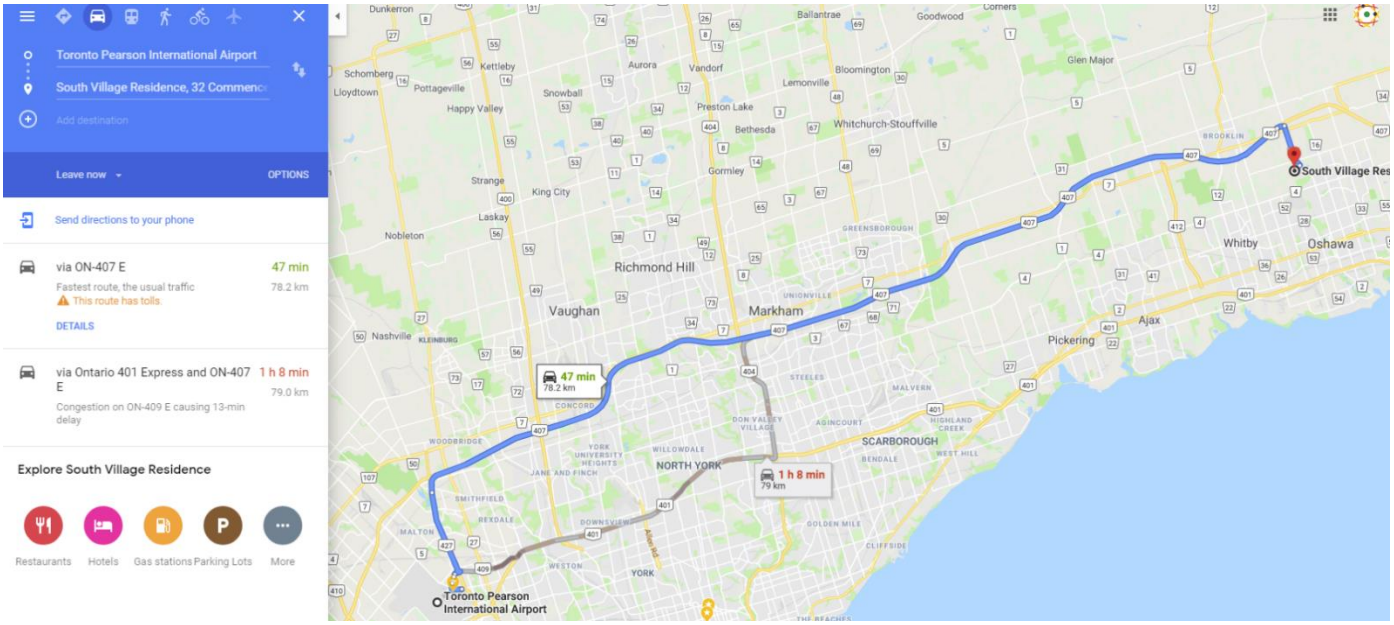
Access to Conference Venue

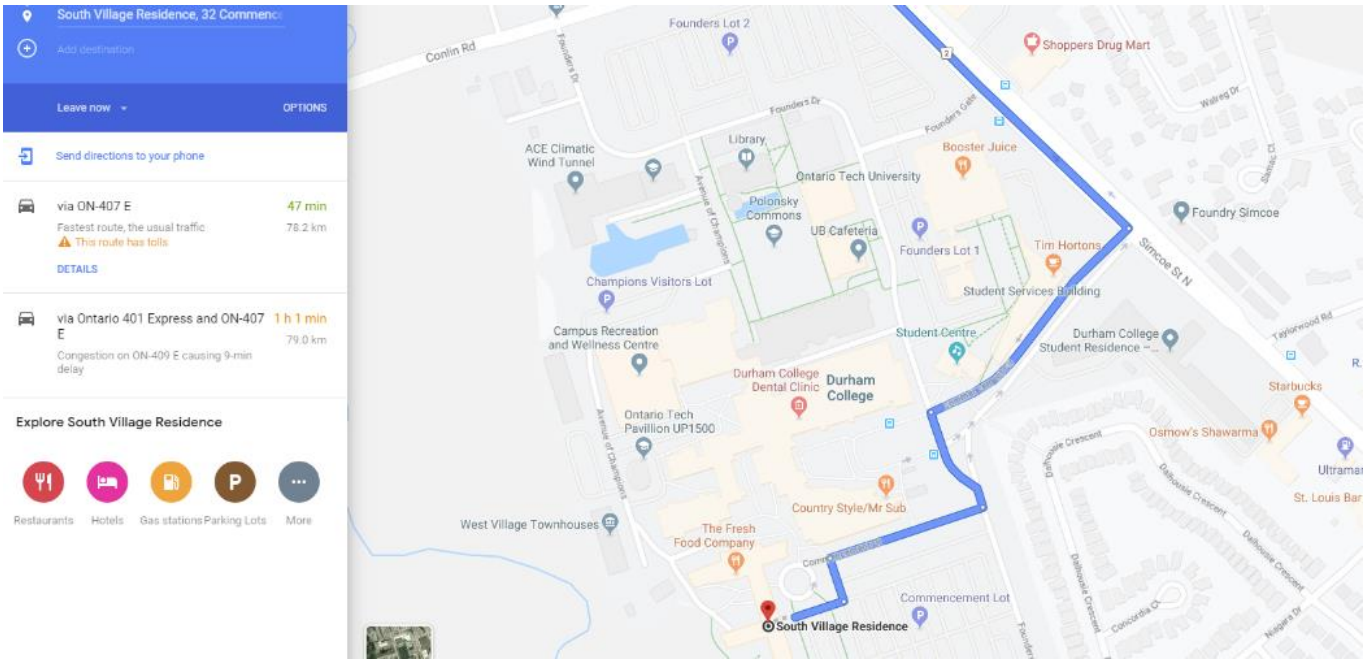
(Residence & Conference Centre – Oshawa)

Tips:

From Toronto Pearson International Airport (YYZ) to the conference venue:

1. By Taxi; (50 minutes or so)
2. By Limo. Toronto Airport Limo is a full-service limousine transportation and airport ground transportation provider serving Toronto, the GTA and all of southern Ontario. Details can be found on Limo website: https://www.torontoairportlimo.com/
3. By Uber.




South Village Residence, 32 Commenc
Add destination
Leave now
OPTIONS
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via ON-407 E
47 min
Fastest route, the usual traffic
78.2 km
This route has tolls
DETAILS
via Ontario 401 Express and ON-407 E
1 h 1 min
79.0 km
Congestion on ON-409 E causing 9-min delay
Explore South Village Residence
Restaurants
Hotels
Gas stations
Parking Lots
More
Conlin Rd
Founders Lot 2
Shoppers Drug Mart
ACE Climatic Wind Tunnel
Library
Booster Juice
Ontario Tech University
Polonsky Commons
UB Cafeteria
Foundry Simcoe
Founders Lot 1
Tim Hortons
Champions Visitors Lot
Student Services Building
Simcoe St N
Campus Recreation and Wellness Centre
Student Centre
Durham College Student Residence
Durham College Dental Clinic
Durham College
Starbucks
Ontario Tech Pavillion UP1500
Osmow's Shawarma
Country Style/Mr Sub
West Village Townhouses
The Fresh Food Company
Commencement Lot
South Village Residence

Travel Information

Airport

For more information about the Toronto-Pearson International Airport, please visit the website at www.torontopearson.com

Getting Around Toronto

Public transport is a great way to see the city. Affordable and reliable, the city can be accessed via the city's underground network: four of main lines connect the city centre to major tourist attractions as well as numerous bus and train stations. Weekly passes are available on weekdays and Saturdays, trains run every few minutes from about 6 a.m. until 1:30 a.m. On Sundays, they run from about 8 a.m. to 1:30 a.m. If you prefer getting around by taxi, it's easy to flag one down on the street.

Banks

Banks are open from Monday to Friday from 09:00 to 18:00 and Saturdays open from 09:00 to 16:00. You will find automated teller machines mostly everywhere.

Car Rentals

Cars can be rented in Toronto from local or international companies. All cars are left-hand drive.

Climate & Clothing

August in Toronto is generally pleasant with daytime temperatures ranging between 18° and 26°. We recommend bringing a range of clothing and dressing in layers. It can be warm in the daytime and chilly in the evenings. Also bring a light jacket to the Palais des congrès as it may feel cold due to air conditioning.

Currency

The Canadian dollar is the national currency. Automatic teller machines and exchange offices are readily available. Most hotels, restaurants and shops accept major credit cards.

Electricity

Electrical outlets in Canada provide the same current as in the United States that is 110 volts (60 cycles). If you are traveling from Europe or elsewhere, you will need an adapter to use small appliances designed for a different standard (220/240 V).

Health Insurance & Hospitals

Canadian hospitals and medical services are excellent. The vast majority of hospitals are publicly managed and rates are set by provincial and hospital authorities. Hospital care for non-residents of Canada is charged at a daily rate or on the basis of the medical condition and length of stay. Charges vary from province to province and from hospital to hospital, but generally range from CAD 1,000 to CAD 2,000 a day. It is therefore important to obtain travel health insurance before leaving home, since it is possible your regular health insurance does not include coverage outside your country of residence.

Languages

The official language of the Conference will be English.

Sales Taxes

Buying anything in Toronto requires a 13% sale tax based on the price.

Program-at-a-Glance of ICCSE 2019

(Aug 18−22, 2019)

Aug 18, 2019. Sunday		
16:00 -20:00	Registration & Reception	UA Atrium
Aug 19, 2019.Monday		
ICCSE Pre-Conference Workshop ***Computer Assisted Language Learning for Learning (a Stress-Time Language) English***		
9:45-10:00	Registration	UA1240
10:00-10:30	Opening	UA1240
10:30-11:00	Special Introduction about the course Dr. Judith Beveridge (English poet and lecturer Sydney University, Australia)	UA1240
11:00-12:30	Introduction and distribution of the Workshop Course Book namely "**English Language Pronunciation and English Speech**" Dr. Senaka Seneviratne School of Electrical & Information Engineering, Sydney University, Australia	UA1240
12:30-13:30	Lunch break	
13:30-15:00	To follow the course book "**English Language Pronunciation and English Speech**" Prof. Liyanage C. De Silva/Dr. Senaka Seneviratne	UA1240
15:00-15:30	Tea break	UA Atrium
15:30-16:30	How to make your English speech perfect (from **English Language Pronunciation and English** Speech) Dr. Senaka Seneviratne School of Electrical & Information Engineering, Sydney University, Australia	UA1240
16:30-17:30	How to use Computer Software Tools effectively in the learning of correct speech. (Computer Assisted Language Learning) Dr. Senaka Seneviratne. School of Electrical & Information Engineering, Sydney University, Australia	UA1240
17:30-18:00	**A discussion on the future directions** With an emphasis on the new research on Computer Software Tools	UA1240

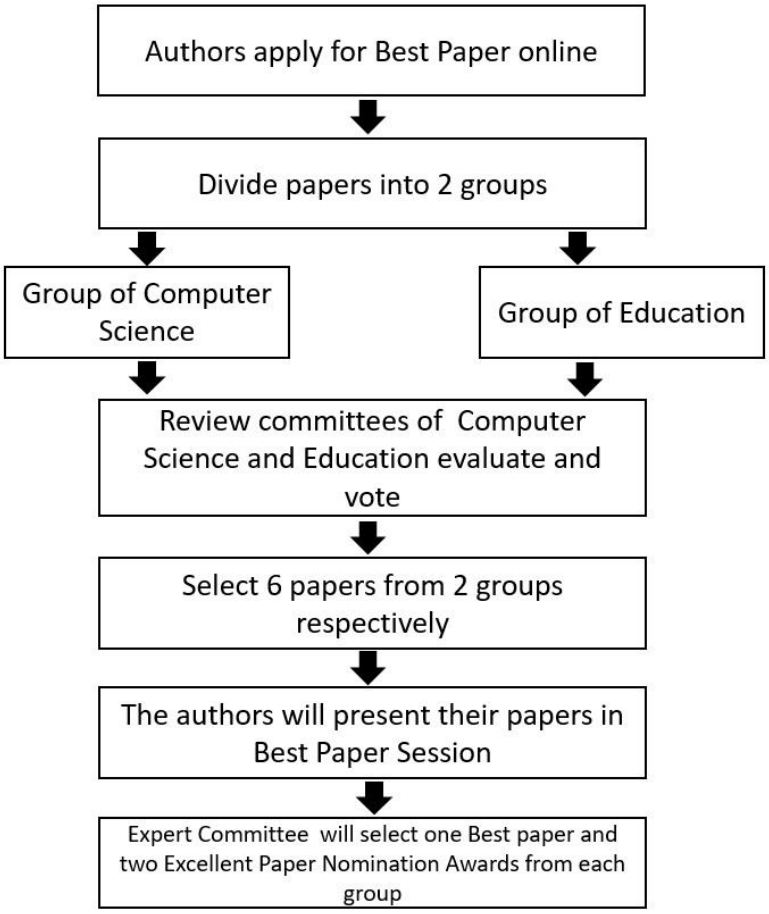
Aug 20, 2019. Tuesday			
09:00-09:15	**Opening Ceremony**		UA1350
9:15-10:00	**Keynotes Speech I** • Prof. Clarence W. de Silva IEEE Fellow, ASME Fellow, Fellow of Canadian Academy of Engineering, and Fellow of Royal Society of Canada Mechanical Engineering Department University of British Columbia, Canada		UA1350
10:00-10:30	**Tea Break and Group Photo**		
10:30-11:10	**Keynote Speech II** • Prof. Dinesh Manocha IEEE Fellow, AAAI Fellow, Department of Electrical and Computer Engineering University of Maryland, USA		UA1350
11:10-11:50	**Keynote Speech III** • Prof. Tamal K. Dey IEEE Fellow, ACM Fellow Department of Computer Science and Engineering, Ohio State University, USA		UA1350
12:30-13:30	**Lunch time** (provided)		UA Atrium
13:30-15:00	**Parallel Sessions 1 (TuesA)**		
Room	UA1350	UA1140	UA1220
Track	**Invited Session I (InS1)**	**Invited Session II (InS2)**	**Invited Session III (InS3)**
Topic	**Smart Mechatronics and Robotics Systems** Chaired by: Dr. Wang Ying, Kennesaw State University, USA Co-chair: Dr. Clarence W. de Silva, University of British Columbia, Canada	**VR, AR, and MR Technologies in Higher Education** Chaired by: Carsten Lecon, Aalen University, Germany	**Technology-Inspired Smart Learning** Chaired by: Prof. Zheng Li, Tsinghua University, China Co-chair: A.P. Li Chao, Tsinghua University, China
15:00-15:20	**Tea Break**		UA Atrium

15:20-16:50	**Parallel Sessions 2**		
Room	UA1120	UA1140	UA1220
Track	**Invited Session IV (InS4)**	**TuesA1**	**TuesA2**
Topic	**Innovative Talent Cultivation under The College-Enterprise Collaborative Model** Chaired by: Prof. Zhao Huan, Hunan University, China Co-Chair(s): Prof. Luo Juan, Hunan University, China A.P. Li Xiaoying, Hunan University, China	**Data Science & AI-I** Chaired by: Prof. Lalith Gamage, Sri Lanka Institute of Information Technology, Sri Lanka	**Data Science** Chaired by: Prof. Weng Yang, Sichuan University, China
15:20-16:50	**Poster Session (TuesP)**		
Room	UA1120	UA1140	UA1220
Track	**TuesP1**	**TuesP2**	**TuesP3**
Topic	**Computer Science-I**	**Education & New Tech-I**	**Data Science & AI-I**
19:00-22:00	**Banquet (Announcement of the Best Papers)**		**Deer Creek Golf Clubs**
Aug 21, 2019. Wednesday			
8:30-10:00	**Parallel Sessions 3 (WedA)**		
Room	UA1120	UA1140	UA1220
Track	**WedA1**	**WedA2**	**WedA3**
Topic	**Data Science & AI-II** Chaired by: Prof. Lin Xianke Ontario Tech University, Canada	**Computer Science & Application-I** Chaired by: Prof. Jonathan Li, Department of Geography and Environmental Management, University of Waterloo, Canada	**Education & Technology-I** Chaired by: Prof. Hong WenXing, Xiamen University, China
10:00-10:20	**Tea Break**		UA Atrium
10:20-11:50	**Parallel Sessions 4 (WedB)**		

Room	UA1120	UA1140	UA1220
Track	**WedB1**	**WedB2**	
Topic	**Computer Science & Application-II** Chaired by: Prof. Samantha Thelijjagoda, Sri Lanka Institute of Information Technology, Sri Lanka	**Education & Technology-II** Chaired by: Prof. Hu Jie, Zhejiang University, China	
12:30-13:30	**Lunch Time** (provided)		UA Atrium
13:30-15:00	**Parallel Sessions 5 (WedC)**		
Room	UA1120	UA1140	UA1220
Track	**WedC1**	**WedC2**	
Topic	**e-Society** Chaired by: Dr. Cui Binyue, Hebei University of Economics & Business, China	**Computer Assistant Language Learning** Chaired by: **(TBD)**	
15:00-15:20	**Tea Break**		UA Atrium
15:20-16:50	**Poster Session (WedP)**		
Room	UA1120	UA1140	UA1220
Track	**WedP1**	**WedP2**	**WedP3**
Topic	**Computer Science-II**	**Education & New Tech-II**	**Data Science & AI-II**
Aug 22, 2019. Thursday			
09:00- 12:00	Lab and company visit (pay at registration)		**TBD**

Best Paper Award

We will select 2 Best Paper Awards in the International Conference on Computer Science and Education annually. How is the Best paper selected? The figure below illustrates the process of Best Paper Award evaluation.



The processing of Best paper selection

Introduction of Presentations, ICCSE 2019

(Oral & Poster)

ICCSE aims to provide an open and effective platform to exchange the ideas for CS and Education field. Generally speaking, all accepted papers should be presented in one of the three methods: a. Oral Presentation, b. Poster Presentation, and Online Presentation.

Oral Presentation:

1. Session Number: Invited Session I-IV, TuesA1-2, WebA1-3, WebB1-2, WebC1-2.
2. Oral Presentation Time: 15 minutes, including discussion.
   (Please check your schedule in technical program)
3. Each speaker is required to meet his/her session chairs in the corresponding session rooms 10 minutes before the session starts and copy the PPT/PDF file to the computer.
4. Each session room is equipped with a projector and a laptop (with Microsoft Windows, Microsoft Power-Point, and PDF reader). Please make sure that your files are compatible and readable with our operation system by using commonly used fonts and symbols.

Poster Presentation:

1. Session Number: TuesP.
2. The Conference will provide an exhibition board (width 0.8m, height 1.2m) for each poster paper. The boards will be arranged in order of the paper in the final program. Tape and other materials will be provided on site, and volunteer-assistants will give necessary help. Posters are required to be condensed and attractive. The characters should be large enough so that they are visible from 1 meter apart.
3. Authors should follow the following instructions.
   Set posters during 15:00-16:30.
   Authors should stay by your poster paper to explain and discuss your paper with visiting colleagues during 17:00-18:30.
   Remove the poster during 18:30-19:00.
   Authors should check the precise schedule concerning poster presentation by the Website of ICCSE2019 or instruction material on the Conference day.

Technical Program

InS1 UA1350
Invited Session I

Chair: Dr. Wang Ying — Kennesaw State University, USA
Co-Chair: Dr. Clarence W. de Silva — Univ. of British Columbia, Canada

13:30 - 13:45 InS1.1
Calibration for Odometry of Omnidirectional Mobile Robots Based on Kinematic Correction, pp. 139-144.
Peng Lin — Dalian Univ. of Tech.
Dong Liu — Dalian Univ. of Tech.
Deyong Yang — The First Affiliated Hospital of Dalian Medical Univ.
Qiang Zou — Dalian Univ. of Tech.
Yu Du — Dalian Dahuazhongtian Tech. Co. Ltd
Ming Cong — Dalian Univ. of Tech., Jiangsu Research Inst. Co. Ltd

13:45 - 14:00 InS1.2
Design of Porcine Abdomen Cutting Robot System Based on Binocular Vision, pp. 188-193.
Ming Cong — Dalian Univ. of Tech.
He Wang — Dalian Univ. of Tech.
Xiang Ren — Dalian Medical Univ.
Yu Du — Dalian Dahuazhongtian Tech. Co. Ltd
Dong Liu — Dalian Univ. of Tech.

14:00 - 14:15 InS1.3
Smart Heating Clothes Based on Bluetooth, pp. 200-203.
Xuwei Fan — Xiamen Univ.
Hezhi Lin — Xiamen Univ.
Chaolin Ye — Xiamen Univ.
Yangyang Guo — Xiamen Univ.
Lianfen Huang — Xiamen Univ.

14:15 - 14:30 InS1.4
A Novel Task Language for Natural Interaction in Human-Robot Systems for Warehouse Logistics, pp. 725-730.
Peter Detzner — Fraunhofer Inst. for Material Flow & Logistics
Jana Jost — Fraunhofer Inst. for Material Flow & Logistics
Thomas Kirks — Fraunhofer Inst. for Material Flow & Logistics

14:30 - 14:45 InS1.5
Development and Analysis of a Hybrid Inverse Kinematic Solution for Anthropomorphic In-Hand Manipulations, pp. 883-888.
Matthew Levins — Ontario Tech Univ.
Haoxiang Lang — Ontario Tech Univ.
Ming Li — Kennesaw State Univ.
Ying Wang — Kennesaw State Univ.

14:45 - 15:00 InS1.6
Optimization of a 3-RRR Delta Robot for a Desired Workspace with Real-Time Simulation in MATLAB, pp. 935-941.
Eric McCormick — Ontario Tech Univ.
Yanjun Wang — Ontario Tech Univ.
Haoxiang Lang — Ontario Tech Univ.

InS2 UA1140
Invited Session II

Chair: Carsten Lecon — Aalen University, Germany

13:30 - 13:45 InS2.1
The design and development of virtual teaching system based on action-oriented, pp. 636-641.
Lianshuan Shi — Tianjin Univ. of Tech. & Edu.
Tian Lian — Tianjin Univ. of Tech. & Edu.
Lu Zhang — Tianjin Univ. of Tech. & Edu.

13:45 - 14:00 InS2.2
VR Course Construction Oriented by Innovation Project Development, pp. 851-855.
Ying Jin — Nanjing Univ.
Jie Zhang — Nanjing Univ.
Ye Tao — Nanjing Univ.
Hong Chen — Shanghai Teach Forward Info. Tech. Co., Ltd.

14:00 - 14:15 InS2.3
Transforming Knowledge into Intelligence, pp. 992-999.
Ying Li — Beihang Univ.

Jiong Zhang — Beihang Univ.
Jian Mao — Jimei Univ.

14:15 - 14:30 InS2.4
Importance of Visual Distance Adjustment for AR Application of Binocular See-Through Smart Glasses, pp. 1080-1082.
Hiromu Ishio — Fukuyama City Univ.
Masaru Miyao — Nagoya Industrial Sci. Research Inst.

14:30 - 14:45 InS2.5
Consideration of Locomotion's in Virtual Environments regarding Kinetosis, pp. 1094-1098.
Carsten Lecon — Univ. of Applied Sciences
Michael Bauer — Univ. of Applied Sciences

InS3 UA1220
Invited Session III
Chair: Prof. Zheng Li — Tsinghua University, China
Co-Chair: A.P. Li Chao — Tsinghua University, China

13:30 - 13:45 InS3.1
The Iteration Function on NetPad, pp. 439-443.
Jie Wang — Guangzhou Univ.
Yongsheng Rao — Guangzhou Univ.
Ruxian Chen — Guangzhou Univ.
Hao Guan — Univ. of Chinese Academy of Sciences
Ying Wang — South China Inst. of Software Eng.
Xiaohong Shi — Guangzhou Univ.

13:45 - 14:00 InS3.2
Instructional Design Model and Analysis of Elderly Health Knowledge Learning System under the Theory of Contextual Learning, pp. 448-453.
Erming Li — Tianjin Univ. of Tech. & Edu.
Lianshuan Shi — Tianjin Univ. of Tech. & Edu.

14:00 - 14:15 InS3.3
Query Based Graph Data Reduction Algorithms and Application in Education, pp. 550-555.
Keyu Song — Tsinghua Univ.
Chao Li — Tsinghua Univ.
Guigang Zhang — Inst. of Automation, CAS
Chunxiao Xing — Inst. of Automation, CAS

14:15 - 14:30 InS3.4
Construction of Intelligent Learning Environment for Multiple Learning Methods, pp. 746-748.
Fei Li — Tsinghua Univ.
Jing Du — Tsinghua Univ.
Bin Li — Tsinghua Univ.

14:30 - 14:45 InS3.5
Edge Intelligence based Co-training of CNN, pp. 830-834.
Feiyi Xie — Univ. of Electronic Sci. & Tech. of China
Aidong Xu — China Southern Power Grid Co., Ltd.
Yixin Jiang — China Southern Power Grid Co., Ltd.
Songlin Chen — Univ. of Electronic Sci. & Tech. of China
Runfa Liao — Univ. of Electronic Sci. & Tech. of China
Hong Wen — Univ. of Electronic Sci. & Tech. of China

14:45 - 15:00 InS3.6
Method and System Constructing for Learning Situation Early Warning based on Data Mining Techniques, pp. 958-965.
Chunqiao Mi — Huaihua Univ.
Niefang Yu — Huaihua Univ.
Xiaoning Peng — Huaihua Univ.

InS4 UA1120
Invited Session IV
Chair: Prof. Zhao Huan — Hunan University, China
Co-Chair: Prof. Luo Juan — Hunan University, China

15:20 - 15:35 InS4.1
A New Teaching Pattern Based on PBL and Visual Programming in Computational Thinking Course, pp. 304-308.
Peipei Gao — Nankai Univ.
Mingxiao Lu — Nankai Univ.
Hong Zhao — Nankai Univ.
Min Li — Nankai Univ.

15:35 - 15:50 InS4.2

Research of the Teachers' Behavior in Blended Teaching under "Internet + Education", pp. 309-313.

Xiaoying Li — Hunan Univ.
Changlong Gu — Hunan Univ.
Huan Zhao — Hunan Univ.
Juan Chen — Hunan Univ.

15:50 - 16:05 InS4.3

Implemention of Flipped Classroom with Problem Based Learning Model in University Programming Language Course, pp. 606-610.

Gang Wang — Nankai Univ.
Hong Zhao — Nankai Univ.
Yun Guo — Nankai Univ.
Min Li — Nankai Univ.

16:05 - 16:20 InS4.4

Exploration on Two-Way Interaction Students Management Mode of Vocational Colleges in Emerging Engineering Education, pp. 846-850.

Na Luo — Hunan Vocational College of Railway Tech.
Chun Wang — Hunan Univ.
Juan Luo — Hunan Univ.

16:20 - 16:35 InS4.5

Reform of University Computer Foundation Course Based on Mobile Terminals in Big Data Era, pp. 925-928.

Niefang Yu — Huaihua Univ.
Xiaoning Peng — Huaihua Univ.
Chunqiao Mi — Huaihua Univ.
Xiaomei Li — Huaihua Univ.

16:35 - 16:50 InS4.6

A Research on the Education Mode of Innovative Software Talents Oriented to Emerging Engineering, pp. 953-957.

Huan Zhao — Hunan Univ.
Jingke She — Hunan Univ.
Zhiyong Li — Hunan Univ.
Huigui Rong — Hunan Univ.
Xun He — Hunan Univ.
Naizheng Bian — Hunan Univ.

TuesA1 UA1140
Data Science & AI-I

Chair: Prof. Lalith Gamage — Sri Lanka Inst. of Information Technology, Sri Lanka

15:20 - 15:35 TuesA1.1

A Many-objective Feature Selection Algorithm for Multi-label Classi?cation Based on Computational Complexity of Features, pp. 85-91.

Azam Asilian Bidgoli — Univ. of Kashan
Hossein Ebrahimpour-Komleh — Univ. of Kashan
Shahryar Rahnamayan, SMIEEE — Ontario Tech Univ.

15:35 - 15:50 TuesA1.2

Tackling Deceptive Optimization Problems Using Opposition-based DE with Center-based Latin Hypercube Initialization, pp. 394-400.

Seyed Jalaleddin Mousavirad — Ontario Tech Univ.
Azam Asilian Bidgoli — Ontario Tech Univ.
Shahryar Rahnamayan — Ontario Tech Univ.

15:50 - 16:05 TuesA1.3

Predicting student performance using weblogs, pp. 616-621.

Bo Wu — Beijing Inst. of Tech.
Shaojie Qu — Beijing Inst. of Tech.
Yin Ni — Beijing Inst. of Tech.
Yemin Zhou — Beijing Inst. of Tech.
Pengxiang Wang — Beijing Inst. of Tech.
Qiwen Li — Beijing Inst. of Tech.

16:05 - 16:20 TuesA1.4

Prediction of short-term available parking space using LSTM model, pp. 631-635.

Xiangdong Li — Zhejiang Univ. of Sci. & Tech.
Yuefeng Cen — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.
Zengwei Xu — Zhejiang Univ. of Sci. & Tech.

16:20 - 16:35 TuesA1.5

Clarification of Topic Differences Between Shops and Consumers for Personalization of Stories, pp. 647-652.

Yuta Sasaki — Ritsumeikan Univ.

Fumiko Harada — Connect Dot Ltd.
Hiromitsu Simakawa — Ritsumeikan Univ.

16:35 - 16:50 — TuesA1.6
A Deep Learning Method for Fault Detection of Autonomous Vehicles, pp. 749-754.
Jing Ren — Ontario Tech Univ.
Rui Ren — Ontario Tech Univ.
Mark Green — Ontario Tech Univ.
Xishi Huang — RS Opto Tech Ltd.

TuesA2 — UA1220
Data Science
Chair: Prof. Weng Yang — Sichuan University, China

15:20 - 15:35 — TuesA2.1
Terroist Group Classification of Historic Terroist Attacks from The Global Terrorism Database, pp. 237-242.
Ralph Laite — Lixar I.T. Inc.
Miguel Lozano — Ontario Tech Univ.
Karthik Sankaranarayanan — Ontario Tech Univ.

15:35 - 15:50 — TuesA2.2
Research on the Judgment and Detection of Battery PSD Curve Big Data System, pp. 345-349.
Rui-Jun Li — Neusoft Inst. Guangdong
Shinn-Dar Wu — Neusoft Inst. Guangdong, USA Saint Paul's College & DePaul Univ
Jue-Jia Chen — Neusoft Inst. Guangdong
Jun-Wei Huang — Neusoft Inst. Guangdong
Ying-Lin Wen — Neusoft Inst. Guangdong.
Chen-Hsiang Chao — SunReadFarm Tech. Co., Ltd
Xiong-Dong Sun — Neusoft Inst. Guangdong.

15:50 - 16:05 — TuesA2.3
Research on Module Design of PSD Big Data Platform, pp. 350-353.
Li-You Chen — Neusoft Inst. Guangdong.
Shinn-Dar Wu — Neusoft Inst. Guangdong, USA Saint Paul's College & DePaul Univ
Hao-Jian Huang — Neusoft Inst. Guangdong.
Xiang-Ting Chen — Neusoft Inst. Guangdong.
Wei-Xin Jiang — Neusoft Inst. Guangdong.
Yea-Chyi Lin — National Cheng Kung Univ.
Yu-Lin Yang — National Chin-Yi Univ.

16:05 - 16:20 — TuesA2.4
Comparing Genetic Programming with Other Data Mining Techniques on Prediction Models, pp. 785-791.
Fateme Azimlu — Ontario Tech Univ.
Shahryar Rahnamayan — Ontario Tech Univ.
Masoud Makrehchi — Ontario Tech Univ.
Naveen Kalra — Ontario Tech Univ.

16:20 - 16:35 — TuesA2.5
Proposing a Pareto-VIKOR Ranking Method for Enhancing Parallel Coordinates Visualization, pp. 895-902.
Khiria Aldwib — Ontario Tech Univ.
Azam Asilian Bidgoli — Ontario Tech Univ.
Shahryar Rahnamayan, SMIEEE — Ontario Tech Univ.
Amin Ibrahim — Ontario Tech Univ.

WedA1 — UA1120
Data Science & AI-II
Chair: Prof. Lin Xianke — Ontario Tech University, Canada

8:30 - 8:45 — WedA1.1
A Machine Learning Framework for Length of Stay Prediction in Emergency Healthcare Services Department, pp. 539-549.
Imeh Umoren — Akwa Ibom State Univ.
Kingsley Udonyah — Akwa Ibom State Univ.
Etebong Isong — Akwa Ibom State Univ.

8:45 - 9:00 — WedA1.2
Task-oriented data collecting strategy in vehicular crowdsensing, pp. 761-766.
Yanglong Sun — Xiamen Univ.
Yuliang Tang — Xiamen Univ.

9:00 - 9:15 — WedA1.3
Analyzing Concreteness in Introspection to Promote Engagement in Healthful Exercises, pp. 872-877.
Takuya Mori — Ritsumeikan Univ.

Hiromitsu Shimakawa — Ritsumeikan Univ.
Fumiko Harada — Connect Dot Ltd.

9:15 - 9:30 — WedA1.4
Automated Classification of Alzheimer's Disease using Deep Neural Network (DNN) by Random Forest Feature Elimination, pp. 1044-1047.
Dilek Manzak — Sakarya Univ.
G?k?en ?etinel — Sakarya Univ.
Ali Manzak — Univ. of Detroit Mercy

9:30 - 9:45 — WedA1.5
LightGBM: an Effective Decision Tree Gradient Boosting Method to Predict Customer Loyalty in the Finance Industry, pp. 1105-1110.
Marcos Roberto Machado — Ontario Tech Univ.
Salma Karray — Ontario Tech Univ.
Ivaldo Tributino de Sousa — Federal Univ. of Ceara

WedA2 — UA1140
Computer Science & Application-I
Chair: Prof. Jonathan Li — Department of Geography & Environmental Management, Univ. of Waterloo, Canada

8:30 - 8:45 — WedA2.1
A Web Based Interactive System to Promote ICT Education in Bangladesh, pp. 77-80.
Mumtahina Huda Mahi — North South Univ.
Tasnim Tarannoom — North South Univ.
Md. Anisul Islam — North South Univ.
Dr. Mohammad Monirujjaman Khan — North South Univ.

8:45 - 9:00 — WedA2.2
Application of Graphical Hardware Programming in Non-Computer Major, pp. 300-303.
Yongqiang Chen — Tsinghua Univ.
Xi Yuan — Tsinghua Univ.
Shuzhen Tian — Tsinghua Univ.
Yang Ding — Shandong Univ.

9:00 - 9:15 — WedA2.3
Static Analyzers and Potential Future Research Directions for Scala: An Overview, pp. 320-325.
Eljose E Sajan — Univ. of Houston
Yunpeng Zhang — Univ. of Houston
Liang-Chieh Cheng — Univ. of Houston

9:15 - 9:30 — WedA2.4
Docker-based Cloud System for Computer Programming Labs, pp. 622-626.
Minsu Chae — Soonchunhyang Univ.
Sangwook Han — Soonchunhyang Univ.
Hwamin Lee — Soonchunhyang Univ.

9:30 - 9:45 — WedA2.5
Cultivation of innovative talent engineering practice ability under the background of Emerging Engineering Education: A Case Study of Internet of Things Teaching, pp. 720-724.
Juan Luo — Hunan Univ.
Yanliu Zheng — Hunan Univ.
Bin Fu — Hunan Univ.

9:45 - 10:00 — WedA2.6
Research on Parallel Detection of Equipment Monitoring Signals of Substation based on Improved ALOHA-Algorithm, pp. 1008-1013.
Hongliang Wang — Kunming Univ. of Sci. & Tech.
Jie Zhou — Kunming Univ. of Sci. & Tech.
Zhijian Liu — Kunming Univ. of Sci. & Tech.

WedA3 — UA1220
Education & Technology-I
Chair: Prof. Hong WenXing — Xiamen University, China

8:30 - 8:45 — WedA3.1
Application of grouped flipped classroom to two-year actual class and its statistical evaluation, pp. 194-199.
Katsuyuki Umezawa — Shonan Inst. of Tech.
Takashi Ishida — Takasaki City Univ. of Economics
Makoto Nakazawa — Junior College of Aizu
Shigeichi Hirasawa — Waseda Univ.

8:45 - 9:00 — WedA3.2

Virtual Simulation Experiments of Train Operation Control for High-speed Railway Based on Data and Scenarios, pp. 585-589.

Yangping Wang — Lanzhou Jiaotong Univ. Gansu Provincial Engineering Research Center for Artificial Intelligence & Graphic & Image Processing
Biao Yue — Lanzhou Jiaotong Univ. Gansu Provincial Engineering Research Center for Artificial Intelligence & Graphic & Image Processing
Jiu Yong — Lanzhou Jiaotong Univ.
Wenrun Wang — Lanzhou Jiaotong Univ.

9:00 - 9:15 WedA3.3

Research on Learners' Eye Movement Behavior for Online Video Courses, pp. 661-666.

Yuanhan Wang — Huazhong Univ. of Sci. & Tech.
Wei Xu — Huazhong Univ. of Sci. & Tech.
Xiaoqing Zhan — Huazhong Univ. of Sci. & Tech.
Wenqing Cheng — Huazhong Univ. of Sci. & Tech.
Wei Liu — Huazhong Univ. of Sci. & Tech.
Wenqi Liu — Huazhong Univ. of Sci. & Tech.

9:15 - 9:30 WedA3.4

Research on Mixed Digital Logic Experiment Mode, pp. 676-680.

Yuchao Gao — Tsinghua Univ.
Ninghan Zheng — Tsinghua Univ.
Chengbin Quan — Tsinghua Univ.
Shanshan Li — Tsinghua Univ.

9:30 - 9:45 WedA3.5

Research on the Formulation Method of Higher Vocational Professional Training Program under the OBE-CDIO Concept, pp. 868-871.

Yue Jia — Dalian Neusoft Univ. of Info.
Yandong Wen — Dalian Neusoft Univ. of Info.
Xinghui Wang — Dalian Neusoft Univ. of Info.

9:45 - 10:00 WedA3.6

Extraction of Poor Learning Items with Automatic Labeling in Fill-in-the-blank Test, pp. 907-912.

Ryosuke Goshima — Ritsumeikan Univ.
Hiromitsu Shimakawa — Ritsumeikan Univ.
Fumiko Harada — Connect Dot Ltd.
Dinh Dong Phuong — Ritsumeikan Univ.

WedB1 UA1120
Computer Science & Application-II

Chair: Prof. Samantha Thelijjagoda — Sri Lanka Inst. of Information Technology, Sri Lanka

10:20 - 10:35 WedB1.1

Research on Transmission Schemes of Massive MIMO Enabled SWIPT Systems, pp. 155-160.

Yifeng Zhao — Xiamen Univ.
Xueting Xu — Xiamen Univ.
Siying Wu — Xiamen Univ.
Lianfen Huang — Xiamen Univ.

10:35 - 10:50 WedB1.2

Application of Intelligent Technology in Animal Husbandry and Aquaculture Industry, pp. 335-339.

Yongqiang Chen — Tsinghua Univ.
Shaofang Li — Yantai Univ.
Hongmei Liu — CEC Huada Electronic Design Co., Ltd
Pin Tao — Tsinghua Univ.
Yilin Chen — Tianjin Polytechnic Univ.

10:50 - 11:05 WedB1.3

Design and Implementation of Human-Computer Interaction Based on User Experience for Dynamic Mathematics Software, pp. 428-433.

Ruxian Chen — Guangzhou Univ.
Yongsheng Rao — Guangzhou Univ.
Ruiqi Cai — Guangzhou Univ.
Xiaohong Shi — Guangzhou Univ.
Ying Wang — South China Inst. of Software Eng.
Yu Zou — Guangzhou Univ.

11:05 - 11:20 WedB1.4

NetPadBrowser:An Offline Browser for Web-Based Dynamic Geometric Resources, pp. 434-438.

Ruiqi Cai — Guangzhou Univ.
Yongsheng Rao — Guangzhou Univ.
Jie Wang — Guangzhou Univ.

Hao Guan — Univ. of Chinese Academy of Sciences
Xiaohong Shi — Guangzhou Univ.
Ying Wang — South China Inst. of Software Eng.

11:20 - 11:35 WedB1.5
Research and Development of a Linear Graph-based MATLAB Toolbox, pp. 942-947.
Eric McCormick — Ontario Tech Univ.
Haoxiang Lang — Ontario Tech Univ.
Clarence W. de Silva — The Univ. of British Columbia

WedB2 UA1140
Education & Technology-II
Chair: Prof. Hu Jie — Zhejiang University, China

10:20 - 10:35 WedB2.1
The influence of ICT attitudes on closing the reading literacy gap of students from different economic, social and cultural backgrounds, pp. 60-64.
Ya Xiao — Zhejiang Univ.
Jie Hu — Zhejiang Univ.

10:35 - 10:50 WedB2.2
Preliminary Study on Student's Assessment in Programming Courses, pp. 81-84.
Anwar Abdalbari — Ontario Tech Univ.
Khalid Hafeez — Ontario Tech Univ.

10:50 - 11:05 WedB2.3
The Effects of ICT Use on Chinese College Students' Study Behavior in B-learning, pp. 103-107.
Hong Zhao — Nankai Univ.
Yun Guo — Nankai Univ.
Kai Wang — Nankai Univ.
Mingxiao Lu — Nankai Univ.
Xiaoyu Yan — Nankai Univ.

11:05 - 11:20 WedB2.4
A match method of encircled feature markers on external store model, pp. 533-538.
Dan Zhou — Xihua Univ.
Xiucheng Dong — Xihua Univ.
Fan Zhang — Xihua Univ.
Wei Chen — Xihua Univ.

11:20 - 11:35 WedB2.5
"Digital Show-How": Extreme Active Learning for Introductory Programming, pp. 755-760.
David Stotts — Univ. of North Carolina

11:35 - 11:50 WedB2.6
THINPAD Experimental Platform for Computer Hardware Experiment, pp. 792-795.
Shanshan Li — Tsinghua Univ.
Weidong Liu — Tsinghua Univ.

WedC1 UA1120
e-Society
Chair: Dr. Cui Binyue — Hebei Univ. of Economics & Business, China

13:30 - 13:45 WedC1.1
The Impact of Social Media Emotions and Behavioral Participation on Destination Image: A Case of Museum Image Mining, pp. 590-595.
Yulin Chen — Tamkang Univ.
Wei Zhou — Beijing Jiaotong Univ.
Binyue Cui — Hebei Univ. of Economics & Business
Yanting Tong — Wuhan Univ. of Tech.

13:45 - 14:00 WedC1.2
An Innovative Hardware Bridging Between Education and Industry, pp. 703-708.
Ha Quang Thanh Ngo — HCMC Univ. of Tech.
Thanh Phuong Nguyen — Ho Chi Minh City Univ. of Tech. (HUTECH)
Hung Nguyen — Ho Chi Minh City Univ. of Tech. (HUTECH)
Ha Quang Thinh Ngo — Vietnam National Univ. Ho Chi Minh city (VNU-HCM)

14:00 - 14:15 WedC1.3
Out-of-class Activities: What Have We Been Doing and How We Can Change it for the Future, pp. 714-719.
Muztaba Fuad — Winston-Salem State Univ.
Monika Akbar — Univ. of Texas at El Paso
Lynn Zubov — WSSU
Debzani Deb — Winston-salem state Univ.

14:15 - 14:30 WedC1.4
A Method for Creating Assessment Items for Computer Science, pp. 1019-1023.
Shareeda Mohammed — The Univ. of the West Indies
Dr. Permanand Mohan — The Univ. of the West Indies

WedC2 UA1140
Computer Assistant Language Learning

13:30 - 13:45 WedC2.1
Computer Assisted Language Learning for Syllable-time Language Exposed Adults who are Learning a new Stress-time Language, pp. 561-566.
Sena Seneviratne — The Univ. of Sydney
Liyanage C De Silva — Univ. Brunei Darussalam
Jie Hu — Zhejiang Univ.
Judith Beveridge — The Univ. of Sydney

13:45 - 14:00 WedC2.2
Analysis of Progression of Scratch Users based on their Use of Elementary Patterns, pp. 573-578.
Kashif Amanullah — Univ. of Canterbury
Tim Bell — Univ. of Canterbury

14:00 - 14:15 WedC2.3
Thematic Learning-based Full-text Retrieval Research on British and American Journalistic Reading, pp. 611-615.
Jiangxia Yu — Capital Normal Univ.
Aiyuan Su — Univ. of International Relations
Wangyang Liu — CETC Big Data Research Inst. Co., Ltd.
Xu Cheng — CETC Big Data Research Inst. Co., Ltd.
Jing Yang — Univ. of International Relations

14:15 - 14:30 WedC2.4
A Unified Multi-label Relationship Learning, pp. 686-691.
Reshma Rastogi — South Asian Univ.
Simran Popli — South Asian Univ.
Nima Dorji Moktan — South Asian Univ.
Sweta Sharma — South Asian Univ.

14:30 - 14:45 WedC2.5
Segmentation of Punjabi Text into Prosodic Unit, pp. 775-779.
Navdeep Kaur — Government Polytechnic College for Girls
Parninder Singh — Guru Nanak Dev Eng. College

14:45 - 15:00 WedC2.6
The Hope: An Interactive Mobile Solution to Overcome the Writing, Reading and Speaking Weaknesses of Dyslexia, pp. 808-813.
Samantha Thelijjagoda — Sri Lanka Inst. of Info. Tech.
Mithila Chandrasiri — Sri Lanka Inst. of Info. Tech.
Dilan Hewathudalla — Sri Lanka Inst. of Information Tech.
Pasindu Ranasinghe — Sri Lanka Inst. of Info. Tech.
Isuru Wickramanayake — Sri Lanka Inst. of Info. Tech.

TuesP1 UA1120
Computer Science-I

9:00 - 17:00 TuesP1.1
Realtime Multi-Person 2D Pose Estimation using ShuffleNet, pp. 17-21.
Chen-Zhi Guan — Nanchang Normal Univ.

9:00 - 17:00 TuesP1.2
Research on School Teaching Platform Based on Blockchain Technology, pp. 38-42.
Liping Li — Yunnan Univ. of Finance & Economics
Xiaosong Wu — Yunnan Univ. of Finance & Economics

9:00 - 17:00 TuesP1.3
A High-reliability Network Architecture Based on Parallel Redundancy Protocol, pp. 43-46.
Yue Wang — Beijing Manufacture Experiments Center of Space Tech.
Xu Zhang — Beijing Manufacture Experiments Center of Space Tech.
Dapeng Zhang — Beijing Manufacture Experiments Center of Space Tech.

9:00 - 17:00 TuesP1.4
Research on Fine-Grain Model Recognition Based on Branch Feedback Convolution Neural Network, pp. 47-51.
Shijin Li — Yunnan Univ. of Finance & Economics
Ting Shi — Yunnan School of Business, Info. & Eng.

Fushou Tao — Yunnan Univ. of Finance & Economics
Rong Jiang — Yunnan Univ. of Finance & Economics

9:00 - 17:00 TuesP1.5
The Reform of Computer Organization Course Based on System Concept, pp. 52-55.
Junxiang Gao — Huazhong Agricultural Univ.
Lihua Bie — Huazhong Agricultural Univ.

9:00 - 17:00 TuesP1.6
A lightweight CaaS private cloud architecture and models for many task computing, pp. 92-96.
Yiyi Xu — Univ. of Tasmania, Guangxi Univ. of Sci. & Tech.
Pengfei Liu — Univ. of Tasmania, Harbin Inst. of Tech., Weihai
Jun Zhao — Guangxi Univ. of Sci. & Tech.

9:00 - 17:00 TuesP1.7
Knowledge Map Completion Method Based on Metric Space and Relational Path, pp. 108-113.
Jie Sun — Hohai Univ.
Guoyan Xu — Hohai Univ.
Yi Cheng — Hohai Univ.
Tianyi Zhuang — Hohai Univ.

9:00 - 17:00 TuesP1.8
A Mobile Intelligent Reading Teaching Annotation System, pp. 114-117.
Tianxiang Feng — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.
Wenxin Pan — Zhejiang Univ. of Sci. & Tech.
Yifan Zhang — Zhejiang Univ. of Sci. & Tech.

9:00 - 17:00 TuesP1.9
Teaching Practice of Graduation Design Course in Digital Media Art Major, pp. 118-121.
Lu Geng — Shanghai Univ. of Eng. Sci.

9:00 - 17:00 TuesP1.10
Recognition of Point Sets Objects in Indoor Scenes, pp. 122-127.
Ruizhen Gao — Hebei Univ. of Eng.
Xiaohui Li — Hebei Univ. of Eng.
Jingjun Zhang — Hebei Univ. of Eng.

9:00 - 17:00 TuesP1.11
Research on the Application of Virtual Reality Technology in the Teaching Model, pp. 145-148.
Jie Jiang — Jiang Xi Sci. & Tech. Normal Univ.
Lei Zeng — Jiang Xi Sci. & Tech. Normal Univ.

9:00 - 17:00 TuesP1.12
Research and development of the regulation training system of minimally invasive knee surgery based on VR technology, pp. 161-164.
Ran Li — Dalian Ocean Univ.
Yan Lou — Chinese Medical Sciences Univ.

9:00 - 17:00 TuesP1.13
University Discipline Construction Progress Monitoring System, pp. 176-179.
Yifan Zhang — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.
Tianxiang Feng — Zhejiang Univ. of Sci. & Tech.

9:00 - 17:00 TuesP1.14
Research on the Application of the Improved Assessment Model Based on the Separation of Teaching and Examination in C Programming, pp. 208-211.
Lijun Pei — Dalian Neusoft Univ. of Info.

9:00 - 17:00 TuesP1.15
Discovering Implicit Quantity Relations Using Convolutional Network, pp. 231-236.
Weina Cheng — Central China Normal Univ.
Xinguo Yu — Central China Normal Univ.
Jingjing Wang — Central China Normal Univ.

9:00 - 17:00 TuesP1.16
Construction of the Global Tourism Platform Based on the "Internet +" Background, pp. 262-265.
Zhaojie Ding — Zhejiang Univ. of Sci. & Tech.
Xuefen Lin — Zhejiang Univ. of Sci. & Tech.
Yuefeng Cen — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.

9:00 - 17:00 TuesP1.17

Autoencoder based API Recommendation System for Android Programming, pp. 273-277.

Jinyang Liu	Peking Univ.
Ye Qiu	Peking Univ.
Zhiyi Ma	Peking Univ.
Zhonghai Wu	Peking Univ.

9:00 - 17:00 TuesP1.18

Retinal vessel segmentation based on Generative Adversarial network and Dilated convolution, pp. 282-287.

Jinlin Ma	North Minzu Univ.
Meng Wei	North Minzu Univ.
Ziping Ma	Northwest Univ.
Li Shi	North Minzu Univ.
Kai Zhu	North Minzu Univ.

9:00 - 17:00 TuesP1.19

Secure Beamforming for Simultaneous Wireless Information and Power Transfer in Wireless-Powered Full-Duplex Relay Networks, pp. 360-365.

Taoshen Li	Guangxi Univ.
Peipei Chen	Guangxi Univ.
Zhe Wang	Guangxi Univ.
Nan Xiao	Guangxi Univ.

9:00 - 17:00 TuesP1.20

Research on Denoising of Finger Vein Image Based on Deep Convolutional Neural Network, pp. 374-378.

Chaoping Zhu	Chongqing Tech. & Business Univ.
Yongbin Yang	Chongqing Tech. & Business Univ.
Yun Jiang	Chongqing Tech. & Business Univ.

9:00 - 17:00 TuesP1.21

Practice Teaching Reform of Discrete Mathematics Model based on D3.js, pp. 379-384.

Tianbo Lu	Beijing Univ. of Posts & Telecommunications
Peng Zhang	Beijing Univ. of Posts & Telecommunications
Huiyang Li	The Univ. of Texas at Arlington

9:00 - 17:00 TuesP1.22

A Simulated Annealing-based Heuristic for Logistics UAV Scheduling Problem, pp. 385-390.

Yixuan Li	Nanjing Univ. of Posts & Telecommunications
Jiazhen Zhang	Nanjing Univ. of Posts & Telecommunications
Ran Meng	Nanjing Univ. of Posts & Telecommunications
Jie Zhu	Nanjing Univ. of Posts & Telecommunications
Haiping Huang	Nanjing Univ. of Posts & Telecommunications

9:00 - 17:00 TuesP1.23

Cloud-based Multi-core Architecture against DNS Attacks, pp. 391-393.

Jiemin Zhang	Jimei Univ.
Jian Mao	Jimei Univ.
Jinming Liu	Jimei Univ.
Zhi Tang	Jimei Univ.
Zhiling Gu	Jimei Univ.
Yongmei Li	Xiamen Inst. of Tech.

9:00 - 17:00 TuesP1.24

A Scheduling Algorithm for Urine Cell Dyeing Machine, pp. 401-405.

Lisheng Wang	Tongji Univ.
Zhiming Yu	Tongji Univ.
Dongdong Zhang	Tongji Univ.
Guofeng Qin	Tongji Univ.
Zhenlei Xu	Tongji Univ.

TuesP2 UA1140
Education & New Tech-I

9:00 - 17:00 TuesP2.1

Research on Talent Cultivation Mode of Computer Between China and America, pp. 11-16.

Xiaoming Zhu	Beijing Normal Univ.
Lin Huang	Beijing Normal Univ.
Donghui Zhang	Beijing Info. Sci. & Tech. Univ.
Yungang Wei	Beijing Normal Univ.

9:00 - 17:00 TuesP2.2

Research on the Platform of Online Education Platform Based on Cloud Computing, pp. 22-25.

Boqin Liu	Southwest Univ.

Hanrong Chen — Southwest Univ.
Junmei He — Southwest Univ.

9:00 - 17:00 TuesP2.3
Enhancing Computer Students' Academic Performance through Predictive Modelling - A Proactive Approach, pp. 97-102.
Leah Mutanu — United States International Univ.
Philip Machoka — United States International Univ.

9:00 - 17:00 TuesP2.4
Evaluating the Performance of Teaching Assistants in Computer Science B-learning Classes, pp. 128-132.
Mingxiao Lu — Nankai Univ.
Hong Zhao — Nankai Univ.
Kai Wang — Nankai Univ.
Yun Guo — Nankai Univ.
Yan Li — Nankai Univ.

9:00 - 17:00 TuesP2.5
Course of Circuit and Electronic Technology for Computer Major, pp. 133-138.
Xiaofeng Zhang — Nanchang Hangkong Univ.
Hongmei Mao — Nanchang Hangkong Univ.

9:00 - 17:00 TuesP2.6
Improving the Management level of Teaching Quality and Training the First-class Skilled Talents, pp. 149-154.
Chengjiang Lu — Guangdong Polytechnic of Sci. & Tech.
Xiafeng Peng — Guangdong Polytechnic of Sci. & Tech.

9:00 - 17:00 TuesP2.7
The reform and practice of the training of computer innovative talents based on SPOC teaching model, pp. 165-167.
Ran Li — Dalian Ocean Univ.
Yan Lou — Chinese Medical Sciences Univ.

9:00 - 17:00 TuesP2.8
The Feasibility Study of Augmented Reality Technology in Early Childhood Education, pp. 172-175.
Yang Kuang — Jiang Xi Sci. & Tech. Normal Univ.
Xiaomei Bai — Jiang Xi Sci. & Tech. Normal Univ.

9:00 - 17:00 TuesP2.9
Innovative Talent Cultivation Pattern of Software Engineering under Internet Plus, pp. 180-183.
Huigui Rong — Hunan Univ.
Shiyong Li — Hunan Univ.
Sheng Xiao — Hunan Univ.
Naizheng Bian — Hunan Univ.
Hang Li — Hunan Univ.

9:00 - 17:00 TuesP2.10
Exploration and Construction of Effective Teaching Environment, pp. 184-187.
Wei Li — Xi'an Univ. of Tech.
Lei Wang — Xi'an Univ. of Tech., Shaanxi Univ. of Tech.
Xinhong Hei — Xi'an Univ. of Tech.
Xiaofan Wang — Xi'an Univ. of Tech.

9:00 - 17:00 TuesP2.11
How to Promote Teaching Quality and Efficiency in University——Quantification Technology, pp. 204-207.
Weihu Wang — Hubei Eng. Univ., Hankou Univ.
Zenggang Xiong — Hubei Eng. Univ., Central China Normal Univ.
Yanshen Liu — Central China Normal Univ.

9:00 - 17:00 TuesP2.12
A New Basic Teaching Mode for Artistic Disciplines under the Information Age, pp. 212-215.
Feng Yu — Shanghai Univ. of Eng. Sci.

9:00 - 17:00 TuesP2.13
Thoughts on cultivating applied and innovative talents in computer majors of universities, pp. 216-221.
Xiaojin Zhang — Minjiang Univ.
Haibo Luo — Minjiang Univ.
Jinglan Wu — Minjiang Univ.

9:00 - 17:00 TuesP2.14
Reverse thinking teaching discussion in high school information technology under new curriculum standards, pp. 222-226.
Jian Gao — Tianjin Normal Univ.
Lan Wang — Tianjin Normal Univ.

9:00 - 17:00 TuesP2.15

Discussion on the reform of university public computer curriculum under the background of new curriculum standard, pp. 227-230.
Fan Xu — Tianjin Normal Univ.
Lan Wang — Tianjin Normal Univ.

9:00 - 17:00 TuesP2.16
An Experiment of Using Portable Lab in Improving Learning Effectiveness in an MCU Course, pp. 253-257.
Wen-Qian Zhang — Xi'an Aeronautical Univ.
Jie Meng — Shanxi Tech. & Business College
Han-Way Huang — Minnesota State Univ. at Mankato

9:00 - 17:00 TuesP2.17
Teaching reform on compiling principal course, pp. 258-261.
Na Wang — Shanghai Polytechnic Univ.
Liping Li — Shanghai Polytechnic Univ.

9:00 - 17:00 TuesP2.18
School-Enterprise Cooperation on Python Data Analysis Teaching, pp. 278-281.
Xinxin Liu — South China Univ. of Tech.
Hongyun Xu — South China Univ. of Tech.

9:00 - 17:00 TuesP2.19
A Case Study of OBE-CDIO Implementation in Network Planning and Design Course, pp. 331-334.
Haiyi Jin — Dalian Neusoft Univ. of Info.

9:00 - 17:00 TuesP2.20
Research on the Processing of Micro-Course Production in ART Higher Education, pp. 366-369.
Lin Zhi — Jiang Xi Sci. & Tech. Normal Univ.
Zhen Xiong — Jiang Xi Sci. & Tech. Normal Univ.

9:00 - 17:00 TuesP2.21
Research on Optimizing Online Course Construction Mode, pp. 370-373.
Zhen Xiong — Jiang Xi Sci. & Tech. Normal Univ.
Lin Zhi — Jiang Xi Sci. & Tech. Normal Univ.

9:00 - 17:00 TuesP2.22
Teaching Strategy of Programming Course Guided by Neuroeducation, pp. 406-409.
Jianwei Zhang — South China Univ. of Tech.

9:00 - 17:00 TuesP2.23
Towards Quality Assurance for Curriculum of Vocational Education based on Effective Learning, pp. 410-414.
Xiaohui Xu — Chongqing College of Electronic Eng.
Xinyi Guo — Chongqing College of Electronic Eng.

9:00 - 17:00 TuesP2.24
The Application Of Critical Thinking In C Programming Language Course, pp. 420-422.
Qingfeng Huang — Huazhong Univ. of Sci. & Tech.
Xiaotao Huang — Huazhong Univ. of Sci. & Tech.
Cai Fu — Huazhong Univ. of Sci. & Tech.

9:00 - 17:00 TuesP2.25
Developing a computerized dynamic assessment system for Chinese EFL learners, pp. 444-447.
Simin Zeng — Harbin Inst. of Tech., Shenzhen
Mingfei Xu — Minzu Univ. of China
Xi Chen — Harbin Inst. of Tech., Shenzhen

9:00 - 17:00 TuesP2.26
Application of Concept Map in the Study of Computational Thinking Training, pp. 454-459.
Ling Xu — Central China normal Univ.
Mingwen Tong — Central China normal Univ.
Bin Li — Central China normal Univ.
Jiang Meng — Central China normal Univ.
Chenyao Fan — Central China normal Univ.

TuesP3 UA1220
Data Science & AI-I

9:00 - 17:00 TuesP3.1
Research on Multi-layer Adaptive Intrusion Detection Based on Clustering and Neural Network, pp. 1-4.
Yingyue Chen — Xiamen Univ. of Tech.

9:00 - 17:00 TuesP3.2
Locality-Sensitive Hashing Scheme Based on Heap Sort of Hash Bucket, pp. 5-10.

Bo Fang — Harbin Inst. of Tech., Shenzhen
Zhongyun Hua — Harbin Inst. of Tech., Shenzhen
Hejiao Huang — Harbin Inst. of Tech., Shenzhen

9:00 - 17:00 TuesP3.3
Elliptic Feature Recognition and Positioning Method for Disc Parts, pp. 26-31.
Jinlin Ma — North Minzu Univ.
Kai Zhu — North Minzu Univ.
Ziping Ma — North Minzu Univ.
Meng Wei — North Minzu Univ.
Li Shi — North Minzu Univ.

9:00 - 17:00 TuesP3.4
Dynamic Facial Expression Recognition Based on Deep Learning, pp. 32-37.
Liwei Deng — Chongqing Univ.
Qian Wang — Chongqing Univ.
Ding Yuan — Chongqing Univ.

9:00 - 17:00 TuesP3.5
Research on Individualized Teaching Based on Big Data Mining, pp. 56-59.
Jie Jiang — Jiang Xi Sci. & Tech. Normal Univ.
Lei Zeng — Jiang Xi Sci. & Tech. Normal Univ.

9:00 - 17:00 TuesP3.6
Research on Evaluation Strategy of Development Degree of Military Academies, pp. 65-70.
Yun Bai — National Univ. of Defense Tech.
Cui Li — National Univ. of Defense Tech.
Peiqi Wang — National Univ. of Defense Tech.

9:00 - 17:00 TuesP3.7
Robust Adaptive Iterative Learning Control for Nonlinear Systems with Non-Repetitive Variables, pp. 71-76.
Wei Zhou — Jiangsu Vocational Inst. of Commerce
Baobin Liu — Jiangsu Vocational Inst. of Commerce

9:00 - 17:00 TuesP3.8
Design of Intelligent Personal Schedule Management System, pp. 168-171.
Jiakai Xu — Zhejiang Univ. of Sci. &Tech.
Wen Zhou — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.

9:00 - 17:00 TuesP3.9
Promoting Deep Learning by Peer Learning, Exploring Blended Teaching Ideas, pp. 243-247.
Yandong Wen — Dalian Neusoft Univ. of Info.
Lijun Pei — Dalian Neusoft Univ. of Info.

9:00 - 17:00 TuesP3.10
An improved RFID anti-collision algorithm and its application in food tracking, pp. 248-252.
Jinsheng Lu — Xiamen Univ.
Lvqing Yang — Xiamen Univ.
Yishu Qiu — Xiamen Univ.
Dingzhao Li — Xiamen Univ.

9:00 - 17:00 TuesP3.11
Predicting PPI Based on Quantum-inspired Neural Networks, pp. 266-272.
Li-Ping Yang — Huazhong Agricultural Univ.
Cheng Zhang — Huazhong Agricultural Univ.
Li Qin — Huazhong Agricultural Univ.

9:00 - 17:00 TuesP3.12
Vibration Fault Diagnosis Method for Planetary Gearbox of Wind Generating Set Based on EEMD, pp. 288-293.
Xianjiang Shi — Harbin Univ. of Sci. & Tech.
Hongjian Li — Harbin Univ. of Sci. & Tech.
Xiangdong Zhu — Harbin Univ. of Sci. & Tech.
Yi Cao — Harbin Univ. of Sci. & Tech.

9:00 - 17:00 TuesP3.13
Research on stator current analysis method of induction motor based on local fault diagnosis of gears, pp. 294-299.
Xianjiang Shi — Harbin Univ. of Sci. & Tech.
Sujian Li — Harbin Univ. of Sci. & Tech.

9:00 - 17:00 TuesP3.14
A Hierarchical Brain Network Model Based on the K-Shell Decomposition Algorithm, pp. 314-319.
Shuyan Peng — Jiangsu Vocational Inst. of Commerce
Wei Zhou — Jiangsu Vocational Inst. of Commerce

Yujun Han — Jiangsu Vocational Inst. of Commerce

9:00 - 17:00 — TuesP3.15
CSIID: WiFi-based Human Identification via Deep Learning, pp. 326-330.
Ding Wang — Zhengzhou Univ.
Zhiyi Zhou — Zhengzhou Univ.
Xingda Yu — Zhengzhou Univ.
Yangjie Cao — Zhengzhou Univ.

9:00 - 17:00 — TuesP3.16
Research on Cross-media Semantic Retrieval Methods of Information Resources Based on Deep Learning, pp. 340-344.
Yu Zhu — Changchun Univ. of Tech.

9:00 - 17:00 — TuesP3.17
Research and Development of Augmented Reality Children's Puzzle Game Based on Vuforia, pp. 354-359.
Guoli Wu — Xiamen Univ.
Ming Qiu — Xiamen Univ.
Yankun Zhang — Xiamen Univ.
Yuhui Zheng — Xiamen Univ.

9:00 - 17:00 — TuesP3.18
A Heuristic Hybrid Recommended Order Modle, pp. 460-465.
Yi Yang — Chongqing Tech. & Business Univ.
Baolin Li — Chongqing Tech. & Business Univ.
Jian Hu — Chongqing Tech. & Business Univ.

9:00 - 17:00 — TuesP3.19
Research on the Application of Medical Big Data, pp. 478-482.
Min Li — Hubei Univ. of Tech.
Chunzhi Wang — Hubei Univ. of Tech.
Lingyu Yan — Hubei Univ. of Tech.

9:00 - 17:00 — TuesP3.20
Research and Application on the High-efficiency Teaching Model Based on Smart Classroom, pp. 483-487.
Hua Yan — Southwest Univ.
Bin Yang — Southwest Univ.

WedP1 — UA1120
Computer Science-II

9:00 - 17:00 — WedP1.1
A Low-cost Mobile VR Walkthrough System for Displaying Multimedia Works Based on Unity3D, pp. 415-419.
Zun Shen — Xiamen Univ.
Juan Liu — Shandong Univ.
Yuhui Zheng — Xiamen Univ.
Lu Cao — Xiamen Univ.

9:00 - 17:00 — WedP1.2
A Multi-Dimensional Features-based Clustering Algorithm for Massive MIMO System, pp. 423-427.
Lianfen Huang — Xiamen Univ.
Hongyue Lin — Xiamen Univ.
Huanhuan Zhang — Xiamen Univ.
Yifeng Zhao — Xiamen Univ.

9:00 - 17:00 — WedP1.3
Top-k Skyline Result Optimization Algorithm in MapReduce, pp. 466-471.
Aili Liu — Dalian Neusoft Univ. of Info.

9:00 - 17:00 — WedP1.4
Multi-Cycle CPU Design With FPGA in Experimental Teaching of Computer Organization, pp. 472-477.
Xing Liu — Wuhan Univ. of Tech.
Linghao Fu — Wuhan Univ. of Tech.
Wenbi Rao — Wuhan Univ. of Tech.
Christophe De Vaulx — Clermont Auvergne Univ.
Xiongmin Lin — Univ. of Victoria
Mingxi Liao — Wuhan Univ. of Tech.

9:00 - 17:00 — WedP1.5
Research on DFF-TopK algorithm based on dynamic feature selection, pp. 493-501.
Xingyi Zhou — Hohai Univ.
Guoyan Xu — Hohai Univ.
Fan Liu — Hohai Univ.
Xinyue Su — Hohai Univ.

9:00 - 17:00 WedP1.6

Adaptive Small Cells Clustering based on Multi to Multi Swap Matching for Ultra Dense Network, pp. 512-517.

Ning Chen — Xiamen Univ.
Siqiang Ke — Xiamen Univ.
Zhibin Gao — Xiamen Univ.
Hongyue Lin — Xiamen Univ.
Minghui Liwang — Xiamen Univ.
Lianfen Huang — Xiamen Univ.

9:00 - 17:00 WedP1.7

Multi-step temperature prediction model based on surrounding cities and long-term memory neural networks, pp. 518-522.

Zhenyue Huang — Henan Univ.
Lei Zhang — Henan Univ.
Xiajiong Shen — Henan Univ.
Liyang Hou — Henan Univ.
Yihua Gao — Henan Univ.
Jun Sun — Henan Univ.

9:00 - 17:00 WedP1.8

Creative Internet of Things (IoT) for Undergraduates, pp. 567-572.

Suk Jin Lee — Columbus State Univ.
Andrew Jung — Univ. of Hartford
Mira Yun — Wentworth Inst. of Tech.

9:00 - 17:00 WedP1.9

U-GAN: Generative Adversarial Networks with U-Net for Retinal Vessel Segmentation, pp. 642-646.

Cong Wu — Hubei Univ. of Tech.
Yixuan Zou — Hubei Univ. of Tech.
Zhi Yang — Hubei Univ. of Tech.

9:00 - 17:00 WedP1.10

Oil spills identification in SAR image based on Convolutional Neural Network, pp. 667-670.

Yaohua Xiong — Dalian Neusoft Univ. of Info.
Hui Zhou — Dalian Neusoft Univ. of Info.

9:00 - 17:00 WedP1.11

Digital Logic Experiment Design Based on FPGA Development Board and OV2640 Camera, pp. 671-675.

Dongdong Zhang — TongJi Univ.
Zhenlei Xu — TongJi Univ.
Lisheng Wang — TongJi Univ.
Chunlin Song — TongJi Univ.
Zhiyu Xu — TongJi Univ.

9:00 - 17:00 WedP1.12

Classification of diabetic retinopathy based on DSIRNet, pp. 692-696.

Cong Wu — Hubei Univ. of Tech.
Dong Xia — Hubei Univ. of Tech.
Jicheng Jin — Hubei Univ. of Tech.
Zhi Yang — Hubei Univ. of Tech.

9:00 - 17:00 WedP1.13

Parameter Range in Hovering Control of Airship, pp. 697-702.

Long Huang — Xiamen Univ.
Shaoping Shen — Xiamen Univ.

9:00 - 17:00 WedP1.14

Experimental Teaching Design for Programmable Features of SDN Northbound Interface, pp. 731-736.

Danhong Zhu — Fuzhou Univ.
Dong Zhang — Fuzhou Univ.
Binjie He — Cisco Systems, Inc.
Chang Zhao — Fuzhou Univ.
Xiang Chen — Fuzhou Univ.

9:00 - 17:00 WedP1.15

FittingGAN: Fitting image Generation Based on Conditional Generative Adversarial Networks, pp. 741-745.

Yanhua Li — Henan Agricultural Univ.
Jianping Wang — Henan Agricultural Univ.
Xiaomei Zhang — Henan Agricultural Univ.
Yangjie Cao — Zhengzhou Univ.

9:00 - 17:00 WedP1.16

Mobile Transaction Processing for a Distributed War Environment, pp. 856-862.

Romani Farid Ibrahim — Mohammed Bin Na?f Academy for Marine Sci. & Security Studies

9:00 - 17:00 WedP1.17

State-Time-Alignment Phone Clustering Based Language-independent Phone Recognizer Front-end for Phonotactic Language Recognition, pp. 863-867.

Wei-Wei Liu	Tsinghua Univ.
Guo-Chun Li	Tsinghua Univ.
Cun-Xue Zhang	Tsinghua Univ.
Hai-Feng Yan	Tsinghua Univ.
Jing He	Tsinghua Univ.
Yan-Miao Song	Tsinghua Univ.
Ying-Xin Gan	Tsinghua Univ.
Jian-Zhong Liu	Tsinghua Univ.
Ying Yin	Tsinghua Univ.

9:00 - 17:00 WedP1.18

Research on Digital Image Design of Traditional Blue and White Patterns under the Background of the "Belt and Road", pp. 918-924.

Yuan Yang	Shanghai Univ. of Eng. Sci.
Yifan Feng	Shanghai Univ. of Eng. Sci.

9:00 - 17:00 WedP1.19

Refining Factors of Healthy Motivations with Observed Data, pp. 970-975.

Yudai Takagaki	Ritsumeikan Univ.
Dinh Dong Phuong	Ritsumeikan Univ.
Fumiko Harada	Connect Dot Ltd.
Hiromitsu Shimakawa	Ritsumeikan Univ.

9:00 - 17:00 WedP1.20

Short-Term Traffic Flow Prediction and Its Application Based on the Basis-Prediction Model and Local Weighted Partial Least Squares Method, pp. 986-991.

Zhiyang Gu	Xiamen Univ.
Sun Zhou	Xiamen Univ.

9:00 - 17:00 WedP1.21

CAT Tool: A Technical Wonder or A Vase?---An Empirical Study of CAT Tools, pp. 1029-1032.

Ji Li	Zhengzhou Normal Univ.
Yi Wang	Henan Univ. Minsheng College
Yu Li	Henan Univ. of Economics & Law

9:00 - 17:00 WedP1.22

Design an Ultra-low Adsorption Gas Sampling System for Ozone and Photochemical Continuous Online Monitoring Instruments, pp. 1053-1056.

Cheng Sun	Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Shaohua Li	Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Wei Zhou	Beijing Jiaotong Univ.
Wenjuan Peng	Beijing Jiaotong Univ.
Chao Gao	Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Yawei Li	Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Hui Wang	Hebei Sailhero Environmental Protection Hi-teh Co.Ltd

9:00 - 17:00 WedP1.23

Mining New Scientific Research Ideas from Quantum Computers and Quantum Communications, pp. 1063-1068.

Qiping Wei	The Univ. of Texas at Arlington
Fengxiang Zhang	Huazhong Univ. of Sci. & Tech.

9:00 - 17:00 WedP1.24

3D Human Body Inpainting using Intrinsic Statistical Shape Models, pp. 1099-1104.

Matthew Korban	Louisiana State Univ.
Xin Li	Louisiana State Univ.
Kehua Miao	Xiamen Univ.
Yimin Zhu	Louisiana State Univ.

WedP2 UA1140
Education & New Tech-II

9:00 - 17:00 WedP2.1

The Techniques and Evaluation method for Beautification of Handwriting Chinese Characters based on Cubic Bézier Curve and Convolution, pp. 502-511.

Pengli Du	Beijing Language & Culture Univ.
Yingbin Liu	Beijing Language & Culture Univ.
Endong Xun	Beijing Language & Culture Univ.

9:00 - 17:00 WedP2.2

A Students' Action Recognition Database In Smart Classroom, pp. 523-527.

Xiaomeng Li	Ocean Univ. of China
Min Wang	Ocean Univ. of China
Wei Zeng	Ocean Univ. of China
Weigang Lu	Ocean Univ. of China

9:00 - 17:00 WedP2.3

Automatic Academic Confusion Recognition In Online Learning Based On Facial Expressions, pp. 528-532.

Zheng Shi	Ocean Univ. of China
Ya Zhang	Ocean Univ. of China
Cunling Bian	Ocean Univ. of China
Weigang Lu	Ocean Univ. of China

9:00 - 17:00 WedP2.4

Research on Mobile Digital Early Education Model Based on "Parent-Child Accompanied Reading" Software, pp. 556-560.

Xiaoting Deng	Xiamen Univ.
Xifeng Wang	Xiamen Univ.
Yi Shen	Xiamen Univ.
Pingping Gu	Xiamen Univ.
Yuhui Zheng	Xiamen Univ.

9:00 - 17:00 WedP2.5

An E-learning Support Middleware with MOOC course recommendation, pp. 596-600.

Tian Xia	Shanghai Second Polytechin Univ.

9:00 - 17:00 WedP2.6

The application of mixed teaching mode in programming courses, pp. 627-630.

Na Lv	Univ. of Jinan

9:00 - 17:00 WedP2.7

Exploration of Software Development Training Program in Vocational Colleges Based on OBE-CDIO, pp. 681-685.

Yandong Wen	Dalian Neusoft Univ. of Info.

9:00 - 17:00 WedP2.8

A Multi-Evaluation System of Students'Learning towards Programming Course based on Blend Learning Environment, pp. 737-740.

Qingchun Hu	East China Univ. of Sci. & Tech.
Yong Huang	Shanghai Audio-video Edu. Center, Shanghai,
Liping Deng	Hong Kong Baptist Univ.

9:00 - 17:00 WedP2.9

Problems and solutions of MOOC application in provincial colleges and universities, pp. 796-801.

Jingya Wang	Shandong Univ. of Finance & Economics
Peiguang Lin	Shandong Univ. of Finance & Economics
Yu Li	Shandong Univ. of Finance & Economics
Ruixia Xu	Shandong Univ. of Finance & Economics
Peiyao Nie	Sanya College
Yuyan Xu	Shandong Univ. of Finance & Economics

9:00 - 17:00 WedP2.10

Research on the Problems and Countermeasures of the Co-construction of School-enterprise Cooperation in Undergraduate Colleges in Shandong Province, pp. 802-807.

Yuyan Xu	Shandong Univ. of Finance & Economics
Yu Li	Shandong Univ. of Finance & Economics
Yixuan Wu	Shandong Univ. of Finance & Economics
Peiguang Lin	Shandong Univ. of Finance & Economics
Peiyao Nie	Sanya College
Jingya Wang	Shandong Univ. of Finance & Economics

9:00 - 17:00 WedP2.11

Teaching Practice and Thinking of SPOC-Rain Classroom Based Flipped Classroom in the Network Technology and Application Course, pp. 814-819.

Sujun Hu	Nanjing Univ. of Posts & Telecommunications
Haiping Huang	Nanjing Univ. of Posts & Telecommunications
Xuemei Wang	Nanjing Univ. of Posts & Telecommunications
Peng Li	Nanjing Univ. of Posts & Telecommunications
Ruchuan Wang	Jiangsu High Tech. Research Key Lab. for Wireless Sensor Networks

9:00 - 17:00 WedP2.12

A Full-Chain Innovative Ecological Environment for Postgraduate Education, pp. 820-825.

Degui Xiao	Hunan Univ.

Kenli Li — Hunan Univ.
Jiawei Luo — Hunan Univ.
Zhiyong Li — Hunan Univ.

9:00 - 17:00 WedP2.13
Research on Project-Based Teaching Quality Evaluation Based on Fuzzy Cluster Analysis, pp. 826-829.
Pingzhang Gou — Northwest Normal Univ.
Shanshan Song — Northwest Normal Univ.

9:00 - 17:00 WedP2.14
Research and Development of Automatic Assessment Strategy for ERP Practical Skills Based on MOOC, pp. 835-839.
Runxin Yang — Beijing Language & Culture Univ.
Ruohui Wang — Beijing Language & Culture Univ.
Jimei Li — Beijing Language & Culture Univ.

9:00 - 17:00 WedP2.15
A Empirical Study of Programming Behaviours on Large Scale Online Learning, pp. 889-894.
Menghua Cao — National Univ. of Defense Tech.
Qian Zhang — National Univ. of Defense Tech.

9:00 - 17:00 WedP2.16
Exploration of New Teaching Method Applied in C++ Course Combined Student's Majors, pp. 903-906.
Tianyong Guo — Nankai Univ.
Yan Li — Nankai Univ.
Mingxiao Lu — Nankai Univ.
Yun Guo — Nankai Univ.

9:00 - 17:00 WedP2.17
Empirical Study on Rain Classroom: A Tool for Blended Learning in Higher Education, pp. 976-980.
Youjie Chen — Tsinghua Univ.
Shuaiguo Wang — Tsinghua Univ.
Xinjie Yu — Tsinghua Univ.

9:00 - 17:00 WedP2.18
Chinese EFL learners' perception of Synchronous-Computer-Mediated Communication in conducting online interactive tasks, pp. 981-985.
Mingfei Xu — Minzu Univ. of China
Simin Zeng — Harbin Inst. of Tech., Shenzhen

9:00 - 17:00 WedP2.19
Study on Sample Size of Candidates Oriented to Online Test, pp. 1000-1004.
Yanbin Feng — Beijing Language & Culture Univ.
Yong Qiao — Beijing Language & Culture Univ.
Xiaoxia Zhao — Beijing Language & Culture Univ.
Jimei Li — Beijing Language & Culture Univ.

9:00 - 17:00 WedP2.20
Research on Key Attributes of Learning Behavior Based on Rough Set, pp. 1024-1028.
Pengyu Liu — Tianjin Normal Univ.
Guiyun Zhang — Tianjin Normal Univ.

9:00 - 17:00 WedP2.21
A Comparative Study of Literary Translation Abilities by Major Online Translation Tools, pp. 1033-1038.
Shuangchu Li — Univ. of Bristol
Yu Li — Henan Univ. of Economics & Law

9:00 - 17:00 WedP2.22
A Methodology for Incorporating Creativity into Lesson Plans, pp. 1039-1043.
Diana Ragbir-Shripat — The Univ. of the West Indies
Permanand Mohan — The Univ. of the West Indies

9:00 - 17:00 WedP2.23
Project-driven information talents training mode in opening environment, pp. 1048-1052.
Hong Song — Central South Univ.
Dandan Lin — Central South Univ.
Ping Zhong — Central South Univ.
Yu Sheng — Central South Univ.
Weiping Wang — Central South Univ.

9:00 - 17:00 WedP2.24
OBE-Based Reform for Software Project Management Curriculum, pp. 1069-1073.
Liping Li — Shanghai Polytechnic Univ.
Na Wang — Shanghai Polytechnic Univ.

Tang Shan — Shanghai Polytechnic Univ.

9:00 - 17:00 — WedP2.25
Discussion and Practice of Computer Practical MOOC, pp. 1089-1093.
Quansheng Yang — Southeast Univ.
Shanshan Li — Tsinghua Univ.

WedP3 — UA1220
Data Science & AI-II

9:00 - 17:00 — WedP3.1
Intelligent Human-Computer Interaction: A Perspective on Software Engineering, pp. 488-492.
Liannan Lin — South China Univ. of Tech.
Jingyan Qiu — South China Univ. of Tech.
Jiaxin Lao — South China Univ. of Tech.

9:00 - 17:00 — WedP3.2
Architectures for Intelligent Assessment on Complex Information System Skills, pp. 579-584.
Ruohui Wang — Beijing Language & Culture Univ.
Jimei Li — Beijing Language & Culture Univ.

9:00 - 17:00 — WedP3.3
Research on Method of Tree Structure Selecting Optimal Medication Granularity Based on of Multi-granularity Decision System, pp. 601-605.
Yu Xue — Henan Univ.
Xiajiong Shen — Henan Univ.
Lei Zhang — Henan Univ.
Daojun Han — Henan Univ.
Tongyuan Qi — Henan Univ.

9:00 - 17:00 — WedP3.4
Artificial Intelligence to Assist E-Learning, pp. 653-654.
Hsiao-Hui Li — Tainan Univ. of Tech.
Yuan-Hsun Liao — Tainan Univ. of Tech.
Yu-Tung Wu — d03220310@gm.tut.edu.tw

9:00 - 17:00 — WedP3.5
Research on the Disciplinary Evolution of Deep Learning and the Educational Revelation, pp. 655-660.
Xue Wang — Beijing Inst. of Tech.
Haiyan He — Beijing Inst. of Tech.
Ping Li — Beijing Inst. of Tech.
Lei Zhang — Renmin Univ. of China

9:00 - 17:00 — WedP3.6
Keyword Analysis and Topic Extraction of Hospital Violence News, pp. 709-713.
Daoli Dong — Guangdong Univ. of Foreign Studies
Ji Li — Guangdong Univ. of Foreign Studies

9:00 - 17:00 — WedP3.7
Suggestions on Accelerating the Implementation of Artificial Intelligence Technology in University Information System, pp. 767-770.
Kun Niu — Beijing Univ. of Posts & Telecommunications
Cheng Cheng — Beijing Univ. of Posts & Telecommunications
Hui Gao — Beijing Univ. of Posts & Telecommunications
Xinjie Zhou — Beijing Univ. of Posts & Telecommunications

9:00 - 17:00 — WedP3.8
A Method of Speaker Recognition for Small-scale Speakers Based on One-versus-rest and Neural Network, pp. 771-774.
Qingyun Sun — Xiamen Univ.
Linkai Luo — Xiamen Univ.
Hong Peng — Xiamen Univ.
Chaojie An — Shenzhen Research Inst. of Xiamen Univ.

9:00 - 17:00 — WedP3.9
A Single-channel BSS Method Based on ICEEMDAN and FastICA and Its Application in EMI Analysis, pp. 780-784.
Hongyi Li — Beihang Univ.
Wei Lin — Beihang Univ.
Di Zhao — Beihang Univ.

9:00 - 17:00 — WedP3.10
Security Analysis and Improvement of Hybrid Signcryption Scheme Based on Heterogeneous System, pp. 840-845.
Shijin Li — Yunnan Univ. of Finance & Economics
Fushou Tao — Yunnan Univ. of Finance & Economics
Ting Shi — Yunnan School of Business, Info. & Eng.

9:00 - 17:00 WedP3.11

Research on Navigation Based on Target Maneuver, pp. 878-882.

Xiaoli Qin — Sci. & Tech. on Space Physics Lab.
Ming Liu — Sci. & Tech. on Space Physics Lab.
Ming Yang — Sci. & Tech.on Space Physics Lab.

9:00 - 17:00 WedP3.12

A Research on Generative Adversarial Networks Applied to Text Generation, pp. 913-917.

Chao Zhang — Hubei Univ. of Tech.
Caiquan Xiong — Hubei Univ. of Tech.
Lingyun Wang — Hubei Univ. of Tech.

9:00 - 17:00 WedP3.13

Differential Evolution Algorithm Based on a Competition Scheme, pp. 929-934.

Seyed Jalaleddin Mousavirad — Ontario Tech Univ.
Shahryar Rahnamayan, SMIEEE — Ontario Tech Univ.

9:00 - 17:00 WedP3.14

Fault Diagnosis of Caster Ladle Turret Based on Fuzzy Decision, pp. 948-952.

Caigao Xiong — Hubei Business College
Dai Pan — Hubei Business College

9:00 - 17:00 WedP3.15

Algorithm for k-anonymity based on ball-tree and projection area density partition, pp. 966-969.

Cheng Chen — Jinan Univ.
Xiaoli Liu — Jinan Univ.
Linfeng Wei — Jinan Univ.
Longxin Lin — Jinan Univ.
Xiaofeng Wu — Guangzhou Sports Vocational & Tech. College

9:00 - 17:00 WedP3.16

Credit Risk Prediction Based on Machine Learning Methods, pp. 1005-1007.

Yu Li — Zhuhai College of Jilin Univ.

9:00 - 17:00 WedP3.17

Research on Modify Protection of Metrology Electronic Certificate Based on Blockchain Technology, pp. 1014-1018.

Yangpeng Zhu — Xi'an Shiyou Univ.
Jiabao He — Xi'an Shiyou Univ.
Kun Yuan — Xi'an Shiyou Univ.
Yanmei Yang — Xi'an Shiyou Univ.

9:00 - 17:00 WedP3.18

Real-time Entity Resolution by Multiple Indices, pp. 1057-1062.

Liang Zhu — Hebei Univ.
Rundong Cui — Hebei Univ.
Qin Ma — Hebei Univ.
Weiyi Meng — State Univ. of New York at Binghamton

9:00 - 17:00 WedP3.19

Control Researches on Nonlinear Systems for A Quadrotor UAV Helicopter Under Impact of Wind Disturbance Based on Method of Domination, pp. 1074-1079.

Lin Chai — Southeast Univ.
Pan Wang — Southeast Univ.
Shumin Fei — Southeast Univ.

9:00 - 17:00 WedP3.20

A Cost-Sensitive Feature Selection Method for High-Dimensional Data, pp. 1083-1088.

Chaojie An — Xiamen Univ.
Qifeng Zhou — Xiamen Univ.

Book of Abstracts

InS1 UA1350
Invited Session I

Chair: Dr. Wang Ying — Kennesaw State University, USA
Co-Chair: Dr. Clarence W. de Silva — Univ. of British Columbia, Canada

13:30 - 13:45 InS1.1
Calibration for Odometry of Omnidirectional Mobile Robots Based on Kinematic Correction, pp. 139-144.

Peng Lin — Dalian Univ. of Tech.
Dong Liu — Dalian Univ. of Tech.
Deyong Yang — The First Affiliated Hospital of Dalian Medical Univ.
Qiang Zou — Dalian Univ. of Tech.
Yu Du — Dalian Dahuazhongtian Tech. Co. Ltd
Ming Cong — Dalian Univ. of Tech., Jiangsu Research Inst. Co.Ltd

In view of kinematic parameters errors, this paper proposes an odometry calibration method for three-wheeled omnidirectional mobile robots. Firstly, the kinematic model of omnidirectional mobile robots is built, and the kinematic parameters are in line with the multivariate linear equation. Then, the mathematical model for multiple linear regression based on least squares is used to estimate the kinematic parameters. Finally, the proposed method is applied to the omnidirectional robot developed by our laboratory. And the position, orientation and velocity of the robot are obtained through experiments. The results show that the odometry accuracy of the mobile robot after calibration is improved, and the effectiveness of the method is verified.

13:45 - 14:00 InS1.2
Design of Porcine Abdomen Cutting Robot System Based on Binocular Vision, pp. 188-193.

Ming Cong — Dalian Univ. of Tech.
He Wang — Dalian Univ. of Tech.
Xiang Ren — Dalian Medical Univ.
Yu Du — Dalian Dahuazhongtian Tech. Co.Ltd
Dong Liu — Dalian Univ. of Tech.

On the background of process automation for slaughtering enterprises, a robot system for porcine abdomen cutting based on binocular vision is established. The system is composed of industrial robot, end effector, binocular camera, IPC and hanging bracket, etc. The study firstly builds transforming relations among coordinate systems by robot calibration. Then, carcass image is taken by using binocular camera, depth information of image is obtained, central line of carcass is recognized and coordinate values of path points are acquired in the end. Finally, moving trajectory of robot can be planned for guiding robot to complete abdomen cutting operation. The experiment shows that the designed system can achieve the scheduled task well and obtain comparatively ideal cutting effect.

14:00 - 14:15 InS1.3
Smart Heating Clothes Based on Bluetooth, pp. 200-203.

Xuwei Fan — Xiamen Univ.
Hezhi Lin — Xiamen Univ.
Chaolin Ye — Xiamen Univ.
Yangyang Guo — Xiamen Univ.
Lianfen Huang — Xiamen Univ.

In this article, in order to solve the problem that everyone needs to wear a lot of clothes to keep warm when the weather is cold, we propose a smart heating clothes based on Bluetooth. The system is simple to operate and has good heating performance. It can be controlled by the mobile phone to heat the partial or full heating cloths in different needs. At the same time, it uses PID algorithm to control the temperature, which can make the temperature quickly controlled to a preset temperature. The system has good performance and can meet the needs of users well, which provides a new idea for smart heating clothes.

14:15 - 14:30 InS1.4
A Novel Task Language for Natural Interaction in Human-Robot Systems for Warehouse Logistics, pp. 725-730.

Peter Detzner — Fraunhofer Inst. for Material Flow & Logistics
Jana Jost — Fraunhofer Inst. for Material Flow & Logistics
Thomas Kirks — Fraunhofer Inst. for Material Flow & Logistics

This paper introduces a novel task description language for human-robot interaction in warehouse logistics to let human workers interact with robots in a natural way. Especially, in decentralized control systems with heterogeneous entities, humans have to retain control over the overall system. This work offers a simple way to build up teams consisting of humans and robots to efficiently use the capabilities of humans as well as robots. With the proposed system it is also possible to provide multi vendor-capabilities and allow an easy integration of robots. We are providing a solution, starting from the user input, converting it into a domain specific language and showing also the execution in human-robot collaboration.

14:30 - 14:45 InS1.5
Development and Analysis of a Hybrid Inverse Kinematic Solution for Anthropomorphic In-Hand Manipulations, pp. 883-888.

Matthew Levins — Ontario Tech Univ.
Haoxiang Lang — Ontario Tech Univ.
Ming Li — Kennesaw State Univ.
Ying Wang — Kennesaw State Univ.

The evolutionary success of humans is a result of many biological factors; however, one predominant advantage is from the capabilities of the human hand. The dexterity of this mechanical system provides the capabilities to perform a wide variety of tasks. This performance is the motivation to design robotic systems with similar characteristics. Anthropomorphic robotic hands are designed to be the robotic counterpart of

human hands. These human-like systems attempt to achieve the same dexterity as human hands to allow flexibility in the applications that require robotic assistance. Controlling these complex systems serves as a challenge in the robotic community and currently limits the capabilities of these advanced robot hands. This paper proposes a solution for controlling objects during in-hand manipulations with inspiration from parallel manipulators. This solution shows promising results that offer the basis for further research into more complex tasks.

14:45 - 15:00 InS1.6

Optimization of a 3-RRR Delta Robot for a Desired Workspace with Real-Time Simulation in MATLAB, pp. 935-941.

Eric McCormick Ontario Tech Univ.
Yanjun Wang Ontario Tech Univ.
Haoxiang Lang Ontario Tech Univ.

This paper presents an introduction to 3-RRR Delta Robots, as well as, the workspace associated with this robot's design configuration. In addition, the inverse kinematic solution of 3-RRR Delta Robots is provided in full detail. Two methods of workspace optimization, Genetic Algorithms (GA) and Maximum Surrounding Workspace (MSW), are explored in order to design a robot which minimizes the amount of unutilized workspace. The results of these two methods are compared to one another, and with a newly proposed method which combines these two approaches. The results produced by these methods demonstrate that this combination of GA and MSW produces the most optimal design for minimizing wasted workspace.

InS2 UA1140
Invited Session II

Chair: Carsten Lecon Aalen University, Germany

13:30 - 13:45 InS2.1

The design and development of virtual teaching system based on action-oriented, pp. 636-641.

Lianshuan Shi Tianjin Univ. of Tech. & Edu.
Tian Lian Tianjin Univ. of Tech. & Edu.
Lu Zhang Tianjin Univ. of Tech. & Edu.

For the problem that exists in actual theory-practice integration instructional practice in some vocational schools, which included unbalanced development of students' key vocational skills, the lack of teaching equipment, absence of integrated multimedia instructional resources and instructional design schemes, a suitable instructional system scheme is designed based on action-oriented teaching concept and Job work process. The Unity3D engine is used to build a virtual teaching software that assisted teaching and training in the theory-practice integration and then conducts integrated teaching that based on action-oriented which can make up for the lack of hardware and software resources in actual teaching. By creating a teaching situation that can mobilize students' conscious activities, and better play the advantages of teaching mode in the integration of theory and practice, which can cultivate high- quality talents. Taking an engine as an example, the construction process of virtual teaching system that based on automobile engine of theory-practice integration was elaborated.

13:45 - 14:00 InS2.2

VR Course Construction Oriented by Innovation Project Development, pp. 851-855.

Ying Jin Nanjing Univ.
Jie Zhang Nanjing Univ.
Ye Tao Nanjing Univ.
Hong Chen Shanghai Teach Forward Info. Tech. Co., Ltd.

Based on the demand for VR talents in today's society, virtual reality technology courses are offered in colleges and universities. This paper explores the construction idea of virtual reality course as one of innovation and entrepreneurship courses, and carries out practical teaching. By introducing the mode of school-enterprise cooperation, we can achieve complementary advantages. In order to achieve the two course objectives of VR technology training and innovation and entrepreneurship awareness training, the course is driven by innovation project development and technology learning, which is set up in four stages: project establishment and technology popularization stage, practical case training stage, independent project development stage, results release and inspection stage, and highlights group system, guidance system and acceptance system as course characteristics. In particular, in the stage of independent project development, the orientation system has been innovated, from students' free proposition to publishing Enterprise-level Project themes and needs, to enhance the integrity and interaction of student projects, and to improve the quality, significance and competitiveness of completed projects.

14:00 - 14:15 InS2.3

Transforming Knowledge into Intelligence, pp. 992-999.

Ying Li Beihang Univ.
Jiong Zhang Beihang Univ.
Jian Mao Jimei Univ.

This paper proposes a novel education paradigm named Wisdom Class (WisClass), comprising three main pillars: Virtual Learning Environment, Mobile Learning Community and Ubiquitous Network. The WisClass teaching mode boasts the new characteristics of independent learning; inquiry learning; and collaborative learning. The paper contains the following contributions: (1) Define WisClass: Due to the diversity of WisClass, it is necessary to comprehensively cover WisClass from many angles, including Intelligent Contents, System Implementation and Classroom Infrastructure. (2) Summarize the Innovation of WisClass: We propose to shift from the conventional Knowledge Class (KnoClass) paradigm to a new WisClass paradigm. More elaborately, a) WisClass improves teaching theory from teacher-oriented to student-oriented; b) WisClass improves teaching paradigm from static state to dynamic state; c) WisClass improves teaching strategy from teaching knowledge to cultivating wisdom; d) WisClass improves teaching method from closed class to open class. (3) Analyze the Characteristics of WisClass: Through massive researches and deep analysis, we explore the WisClass from three characteristics. a) WisClass Teaching: WisClass has a process of enlightening, situational, dynamic, and innovative teaching. b) WisClass Learning: WisClass has a process of constructivist, inquiring, blended and cooperative learning. c) WisClass Environment: WisClass has a digital, interactive, dynamic and situational environment. (4) Construct a real WisClass: we construct a real WisClass by cooperatively building hardware environment and software system as a holistic design system. a) The hardware environment includes cloud server, WIFI server, hardware equipment; b) the software system contains cloud platform, online/offline learning environment, leaning evaluation system and Trinitarian learning material system. Our works will play a promising role in the future development of several system design perspectives: (1) Intelligent Contents: In order to better cultivate wise learners, the teaching environment and objective are both focused on intelligent teaching methods. Specifically, a) it takes the educators' wisdom teaching method as essential condition; b) it takes the digital teaching environment as material basis; c) it takes the learners' wisdom development as teaching objective. WisClass incarnates the think of

"Transforming Knowledge In to Wisdom". (2) Classroom Infrastructure: The intelligent teaching in WisClass hinges upon perceptive, dynamic, active, open and wisdom of physical space. In order to provide a human-friendly space, it is important to have WisClass Infrastructure equipped with modern IT devices, e.g. audio-visual equipment, computer and interactive whiteboard, internet-accessible teaching materials. Especially, the last system encourage educators and learners to timely access the resources and update learning materials. In addition, an ideal infrastructure should also support various WIFI-accessible and internet-enhanced teaching tools such as Distance Learning and Learning Community. WisClass facilitates intelligent teaching environments. Moreover, it can seamlessly integrate people, devices, resource, environment, thought and methods. All this together make it feasible to realize multiple intelligent scenes teaching and man-machine interaction. (3) System Implementation: In order to provide an intelligent and informational classroom, we incorporate modern and most advanced IT. The purpose is that WisClass may improve teaching paradigm in the aspects of three-dimensional interaction, smart evaluation and information push. WisClass provides a natural platform which integrates IT and class teaching.

14:15 - 14:30 InS2.4

Importance of Visual Distance Adjustment for AR Application of Binocular See-Through Smart Glasses, pp. 1080-1082.

Hiromu Ishio — Fukuyama City Univ.
Masaru Miyao — Nagoya Industrial Sci. Research Inst.

Recently, smart glasses have become available for medical, industrial, managemental and gaming applications as well as education. In particular, binocular see-through smart glasses have two transparent stereoscopic displays, realizing an augmented reality (AR) environment where the real world is optically merged with computer-generated virtual information. In spite of the fact that AR using such smart glasses is gaining popularity in the market, it was not clear how they affect human visual functions such as accommodation and convergence in the human eye. A recent experiment has revealed that convergence accommodation occurs in the viewer's eye in response to a stimulus of a virtual image projected by using binocular seethrough smart glasses. Revisiting the experimental results, we importantly point out that it is necessary to take into account the convergence accommodation when we use binocular seethrough smart glasses for AR applications. Otherwise, eye and vision problems may be caused because of depth-perception rivalry.

14:30 - 14:45 InS2.5

Consideration of Locomotion's in Virtual Environments regarding Kinetosis, pp. 1094-1098.

Carsten Lecon — Univ. of Applied Sciences
Michael Bauer — Univ. of Applied Sciences

Virtual worlds are more and more important in many fields of application: Training, simulation, learning, visualization, games, etc. However, often the users suffer from kinetosis (motion sickness). In this paper, we present possible counteractions and an approach by which the users can adapt to acting in virtual environments when using a head mounted display.

InS3 — UA1220
Invited Session III

Chair: Prof. Zheng Li — Tsinghua University, China
Co-Chair: A.P. Li Chao — Tsinghua University, China

13:30 - 13:45 InS3.1

The Iteration Function on NetPad, pp. 439-443.

Jie Wang — Guangzhou Univ.
Yongsheng Rao — Guangzhou Univ.
Ruxian Chen — Guangzhou Univ.
Hao Guan — Univ. of Chinese Academy of Sciences
Ying Wang — South China Inst. of Software Eng.
Xiaohong Shi — Guangzhou Univ.

Iteration is a special graphic transformation similar to the recursive algorithm in programs, which can effectively solve some specific mathematical problems. At present, most dynamic geometry systems(DGS) have the iteration function, which meets the demand of teaching. NetPad, one of the DGSs, has optimized the iteration function on the basis of other sketchpads. This paper introduces the iteration function of NetPad. It provides the implicit iteration, random color hierarchy of each iteration object, trajectory iteration and iteration of iteration. Through teaching cases, the superiority of NetPad in iteration function is verified.

13:45 - 14:00 InS3.2

Instructional Design Model and Analysis of Elderly Health Knowledge Learning System under the Theory of Contextual Learning, pp. 448-453.

Erming Li — Tianjin Univ. of Tech. & Edu.
Lianshuan Shi — Tianjin Univ. of Tech. & Edu.

The contextual learning includes the content of learning, the context of learning, and the connection between knowledge and knowledge. It is diversified, dynamic, and complex. The instructional design of the health knowledge learning system for the elderly is based on the theory of contextual learning, which links the learning content with the surrounding context. It has multiple presentation methods, the teaching activities are interactive, and the teaching process is non-linear. From the perspective of the elderly, it is better help the elderly understand health knowledge.

14:00 - 14:15 InS3.3

Query Based Graph Data Reduction Algorithms and Application in Education, pp. 550-555.

Keyu Song — Tsinghua Univ.
Chao Li — Tsinghua Univ.
Guigang Zhang — Inst. of Automation, CAS
Chunxiao Xing — Inst. of Automation, CAS

Graph is a commonly used data structure to store large relational data in today's education networks. With the growing demand for storing and processing large graph data,graph data compression is becoming more important. By reducing large graph data itself, we will also be able to reduce memory space, processing time and transmission cost. While most existing compression methods compress general graphs by generating an encoded representation, we propose query based graph reduction algorithms. Query based graph reduction algorithms, by take advantage of

structural properties of graph and edge weight,compute reduced graphs that preserves necessary information to answer specific queries through removing irrelevant nodes and edges. We study graph reduction algorithms based on two typical queries: shortest path queries and minimum spanning tree queries. In this paper, we illustrate our algorithm in detail,provide proof for the correctness of the algorithms and show estimation of their reduction ratio on actual graphs and generated graphs according to our test results.

14:15 - 14:30 InS3.4

Construction of Intelligent Learning Environment for Multiple Learning Methods, pp. 746-748.

Fei Li Tsinghua Univ.
Jing Du Tsinghua Univ.
Bin Li Tsinghua Univ.

This paper introduces three principles of intelligent learning environment design and put forward to a construction model that pulls “facilities, platform systems and learning resources” together, and strives to build a demonstration center for the deep integration of information technology and education. Then the paper takes three typical pedagogical applications as examples to show how intelligent learning space supporting innovative classroom, flipped classroom and remote interactive class.

14:30 - 14:45 InS3.5

Edge Intelligence based Co-training of CNN, pp. 830-834.

Feiyi Xie Univ. of Electronic Sci. & Tech. of China
Aidong Xu China Southern Power Grid Co., Ltd.
Yixin Jiang China Southern Power Grid Co., Ltd.
Songlin Chen Univ. of Electronic Sci. & Tech. of China
Runfa Liao Univ. of Electronic Sci. & Tech. of China
Hong Wen Univ. of Electronic Sci. & Tech. of China

Improving training efficiency is a long-term major topic of neural network. With the popularity of intelligent terminal devices, such as smart phones and smart household electrical appliances, edge computing is gradually developing to edge intelligence (EI),which provides support to multiple terminals and play a role of a mini cloud. By making full use of the computing power of intelligent terminals in EI, while cooperating with edge servers, the training efficiency of convolution neural network (CNN) can effectively be improved. In this paper, an EI based co-training model between the edge server and intelligent terminals is proposed. The edge server and terminals propagate part of the CNN separately to accelerate the training of the CNN. Running time is greatly cut down by the division of CNN and simultaneous propagation of multiple terminals.

14:45 - 15:00 InS3.6

Method and System Constructing for Learning Situation Early Warning based on Data Mining Techniques, pp. 958-965.

Chunqiao Mi Huaihua Univ.
Niefang Yu Huaihua Univ.
Xiaoning Peng Huaihua Univ.

At present, there are some problems in early warning of student learning situation, such as single assessment index, outdated technology method, lack of specialized information support system, time-delayed evaluation feedback and etc. In order to deal with these problems, in this study a complete learning situation evaluation and early warning system is proposed based on data mining techniques, which consists of evaluation index system, learning failure risk early warning model, result visualization method, and information support system. The result of this study can help improve the whole efficiency and effectiveness of early warning education for colleges and universities, enhance learning quality and success rate for students, and promote the deep integration of information technology and education practice, so it is of both academic and practical reference significance.

InS4 UA1120
Invited Session IV

Chair: Prof. Zhao Huan Hunan University, China
Co-Chair: Prof. Luo Juan Hunan University, China

15:20 - 15:35 InS4.1

A New Teaching Pattern Based on PBL and Visual Programming in Computational Thinking Course, pp. 304-308.

Peipei Gao Nankai Univ.
Mingxiao Lu Nankai Univ.
Hong Zhao Nankai Univ.
Min Li Nankai Univ.

As a fundamental and introductory course in undergraduate education, Computer Basis aims to cultivate the scientific computational thinking mode and the ability of solving problem for students who are not the computer majors. In this study, a new pedagogical method named PBL-VP combining the Problem-Based Learning (PBL) and the visual programming Blockly was applied to Computer Basis. This paper described a classical example about problem solving to explain the teaching process of the PBL-VP in detail. The process of problem solving was divided into several operable steps to gradually guide students to analyze problems, provide solutions and establish scientific logic thinking. Blockly was introduced to obscure the grammar of programming language and implement the algorithm visually. Finally, we evaluated the effectiveness of the PBL-VP teaching method on student learning by a contrast test. The empirical results proved that students in the class with PBL-VP earned higher final grades and the teaching method we proposed played a positive role in computer general education.

15:35 - 15:50 InS4.2

Research of the Teachers’ Behavior in Blended Teaching under "Internet + Education", pp. 309-313.

Xiaoying Li Hunan Univ.
Changlong Gu Hunan Univ.
Huan Zhao Hunan Univ.
Juan Chen Hunan Univ.

Under the "Internet + education" environment, blended learning model is more and more widely used in China’s higher education. Blended learning combines the online learning and classroom face-to-face teaching, and take advantage of their respective strengths. Teachers are the facilitators and promotors of learning. Students are the main body. Blended learning can effectively stimulate students’ enthusiasm for learning,

improve students' self-learning ability and innovative ability, and improve learning efficiency. This paper researches and analyzes the teaching behavior of teachers and points out the issues that should be noted in blended learning.

15:50 - 16:05 InS4.3

Implemention of Flipped Classroom with Problem Based Learning Model in University Programming Language Course, pp. 606-610.

Gang Wang Nankai Univ.
Hong Zhao Nankai Univ.
Yun Guo Nankai Univ.
Min Li Nankai Univ.

In this paper we report an experiment of implementing a flipped classroom combined with problem based learning approach in teaching a university programming course. We give the method of how to make the pre-recorded lecture videos and how to design a problem-based in-class activities. The results of the experiment show that our teaching approach, compared with traditional teaching approach, is more effective. Students in experiment class get higher scores in the final exam. And our teaching approach also have a positive impact on students' learning, engagement, performance, collaboration and retention.

16:05 - 16:20 InS4.4

Exploration on Two-Way Interaction Students Management Mode of Vocational Colleges in Emerging Engineering Education, pp. 846-850.

Na Luo Hunan Vocational College of Railway Tech.
Chun Wang Hunan Univ.
Juan Luo Hunan Univ.

In recent years, study and practice on emerging engineering education is developing by leaps and bounds, vocational education has made considerable strides. It brings new challenges to student management in vocational colleges. Therefore, in emerging engineering education, more student management modes must be developed to meet personalized teaching requirements. This paper first investigates and discusses current situation of students' behavior in vocational colleges. On this foundation, a "two-way interaction" student management mode of vocational colleges in emerging engineering education is proposed and explored. The "two-way interaction" management mode are equipped with some new concepts such as: "studentoriented", "dual aspects in student managers", "two sides of students and teachers", and "the process of management is the process of improving students' quality", to replace the traditional management concept that emphasizing managing students with the new one that aims at cultivating students' abilities of creative, cognitive, collaborative, and problem-solving. The theory and the practical results of this paper provide beneficial reference for effectively solving the current problems in vocational education management, and improving the qualities of students in vocational schools.

16:20 - 16:35 InS4.5

Reform of University Computer Foundation Course Based on Mobile Terminals in Big Data Era, pp. 925-928.

Niefang Yu Huaihua Univ.
Xiaoning Peng Huaihua Univ.
Chunqiao Mi Huaihua Univ.
Xiaomei Li Huaihua Univ.

Under the background of big data era, the rise of mobile terminals has also put forward new requirements for the teaching of university computer foundation course. This thesis puts forward some common problems in the teaching practice, and discusses how to promote informatization education under the background of big data based on mobile terminals, thus improving teaching quality and cultivating students into individuals with independent learning, cooperative spirit and innovative ability.

16:35 - 16:50 InS4.6

A Research on the Education Mode of Innovative Software Talents Oriented to Emerging Engineering, pp. 953-957.

Huan Zhao Hunan Univ.
Jingke She Hunan Univ.
Zhiyong Li Hunan Univ.
Huigui Rong Hunan Univ.
Xun He Hunan Univ.
Naizheng Bian Hunan Univ.

The new generation of technologies, represented by cloud computing, artificial intelligence (AI), internet of things (IoT), and mobile internet, is driving the great renovation of human society as well as the rapid development of new economy and new industries. New requirements are then emerged for the software engineering education at this new era. Hunan University (HNU) relies on outstanding platforms, such as the National Demonstration Software College, the National Featured Software Engineering Major, and the National Pilot Zone for Software Talents Education, carrying out researches on teaching mode renovation, course scheme renovation, and practice scheme renovation within a series of teaching renovation projects. As a result, the Innovative Software Talents (IST) education scheme has been established with accountable achievements and it also has been widely introduced, demonstrated, and applied among Chinese universities.

TuesA1 UA1140
Data Science & AI-I

Chair: Prof. Lalith Gamage Sri Lanka Inst. of Information Technology, Sri Lanka

15:20 - 15:35 TuesA1.1

A Many-objective Feature Selection Algorithm for Multi-label Classi?cation Based on Computational Complexity of Features, pp. 85-91.

Azam Asilian Bidgoli Univ. of Kashan
Hossein Ebrahimpour-Komleh Univ. of Kashan
Shahryar Rahnamayan, SMIEEE Ontario Tech Univ.

Multi-label classification constructs a model on instances which are associated to a set of labels. Similar to traditional single-label classification, redundant and irrelevant features degrade the performance of classification in terms of multiple criteria. So, feature selection task can be modeled as optimizing several conflicting objectives in a large search space simultaneously. Minimizing the number of features and the error of classification

are two well-known objectives which are considered in several multi-objective feature selection methods. In addition of these objectives, the computational complexity of features is one of the most important properties of selected features which should be minimized as a crucial objective. In many applications, complex features are indispensable for classification performance enhancement, but they require an expensive computational?time. As a result, it is desired to select less complex features while offer a higher classification accuracy. The key contribution of this paper is proposing a many-objective optimization method, for first time, to select best subset of features for multi-label data based on four objectives include number of features, two classification error measures (i.e., Hamming loss and Ranking loss), and the complexity of selected features. The defined many-objective optimization problem is solved using a proposed binary version of NSGA-III algorithm. In order to evaluate the proposed algorithm (i.e., binary NSGA-III), a benchmarking is conducted on eight multi-label datasets in terms of several multi-objective assessment metrics, including, the Hypervolume indicator, Pure Diversity, and Set-coverage. Experimental results show significant improvements for proposed method in comparison with NSGA-II approach.

15:35 - 15:50 TuesA1.2

Tackling Deceptive Optimization Problems Using Opposition-based DE with Center-based Latin Hypercube Initialization, pp. 394-400.

Seyed Jalaleddin Mousavirad — Ontario Tech Univ.
Azam Asilian Bidgoli — Ontario Tech Univ.
Shahryar Rahnamayan — Ontario Tech Univ.

Deceptiveness is among hard to tackle characteristics of the optimization problems. So far, a few papers are published in this area, while there are many real-world deceptive optimization problems. In a deceptive problem, the landscape does not provide useful information in order to progress toward the global optimum. In another word, it tends towards the deceptive attractors. As a result, finding the global optimum is a challenging task in this family of optimization problems. The goal of this paper is to propose a population-based algorithm for solving these problems. Opposition-based learning (OBL) is a well-established approach to enhance meta-heuristic algorithms. Based on OBL concept, the opposite of a candidate solution is generated. Then, based on the objective values of the candidate solution and its opposite, the OBL selects the best. In another word, the proposed algorithm generates opposite of good and bad candidates in the population to break out the deceptiveness of objective function. Opposition-based DE is using OBL during population initialization and also during its iterations. The ODE version proposed in this paper is different from the original ODE algorithm; in fact the scheme to generate the opposite candidate is redefined differently. Another approach used in this paper is Latin Hypercube Sampling (LHS). LHS is a statistical method to generate random samples using a multidimensional distribution. This paper combines a modified LHS and OBL with differential evolution algorithm to tackle deceptiveness in the landscape. In order to evaluate the efficiency of the proposed algorithm, some shifted benchmark functions with various characteristics are utilized. The results verify the performance superiority of the proposed algorithm

15:50 - 16:05 TuesA1.3

Predicting student performance using weblogs, pp. 616-621.

Bo Wu — Beijing Inst. of Tech.
Shaojie Qu — Beijing Inst. of Tech.
Yin Ni — Beijing Inst. of Tech.
Yemin Zhou — Beijing Inst. of Tech.
Pengxiang Wang — Beijing Inst. of Tech.
Qiwen Li — Beijing Inst. of Tech.

In the past few years, increasing numbers of researchers are focusing on educational data mining. Previous researchers have built models to predict student performance regarding behavior on online learning platforms, data on canteen consumption, and so on. Students' behavior on the web has also been linked to academic performance. As the considerable quantity of weblog data and the low informativeness of unit data, it is difficult to process weblog data quickly and to examine the relationship between students' online behavior and performance. In this paper, we aim to examine the relationship between student online behaviors and performance in a timely manner. We first optimize the data processing speed in Hadoop which stores the weblog data, and then propose a method to select the features that most affect student performance. Finally, we propose methods to predict the relationship between these features and student achievement. The experimental results show that the number of visits to some websites is positively correlated with students' performance while some are negatively correlated. The accuracy using long short-term memory (LSTM) to predict student academic performance reached 81.22%. In this paper, we contribute to accelerating weblog processing and finding the relationship between online behaviors and student academic performance.

16:05 - 16:20 TuesA1.4

Prediction of short-term available parking space using LSTM model, pp. 631-635.

Xiangdong Li — Zhejiang Univ. of Sci. & Tech.
Yuefeng Cen — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.
Zengwei Xu — Zhejiang Univ. of Sci. & Tech.

Real-time and accuracy prediction of available parking space plays an important role in intelligent urban traffic, which guides the driver to find a parking space efficiently. A novel prediction method of the urban short-term available parking space is proposed in this paper. Firstly, considering the time series characteristics of parking data, the Long Short-Term Memory (LSTM) model in introduced to predict the available parking space. Secondly, the genetic algorithm is introduced to adaptively adjust the parameters of LSTM, which saves lots of time for the training of this model. Experimental results show that the proposed method achieves a significant prediction accuracy comparing with back propagation (BP) neural network, while still maintaining high adaptability.

16:20 - 16:35 TuesA1.5

Clarification of Topic Differences Between Shops and Consumers for Personalization of Stories, pp. 647-652.

Yuta Sasaki — Ritsumeikan Univ.
Fumiko Harada — Connect Dot Ltd.
Hiromitsu Simakawa — Ritsumeikan Univ.

In recent years, story marketing has been used in order to achieve differentiation of products that are becoming homogeneous. However, it cannot be always said that the information provided by a store matches what the individual consumer demands. In this research, we propose a method to create stories reflecting the interests and preferences of individual customers and consumers. In the proposed method, a topic group expressing the customer's interests and preferences are obtained through the topic analysis of the texts of store interview and the customers' past experiences. The interest of an individual customer for each topic is estimated based on the obtained topic group. The estimated interests help stores to determine what stories they should provide for each customer.?In order to verify the validity of the proposed method, an experiment was

conducted to reveal differences in interests among consumers as well as differences in the information provided by the store and the interests of each customer. From the experiment, it was found that when there are multiple topics in the information by the store, the interest in the topic is different by each subject. Additionally, it was demonstrated that the customer may be interested in topics that the store has not included.

16:35 - 16:50 TuesA1.6

A Deep Learning Method for Fault Detection of Autonomous Vehicles, pp. 749-754.

Jing Ren Ontario Tech Univ.
Rui Ren Ontario Tech Univ.
Mark Green Ontario Tech Univ.
Xishi Huang RS Opto Tech Ltd.

Fault detection is a crucial step for the safe operation of autonomous vehicles. Failure to detect faults can result in component failure leading to the breakdown of the car or even catastrophic accidents. In this paper, we propose a general fault detection method using deep learning techniques to learn patterns of faults reflected in the dynamic model of an autonomous vehicle. We have applied the proposed method to a remotely operated scaled multi-wheeled combat vehicle and evaluated the algorithm using normal and defective signals. The results show that the proposed deep learning method can accurately identify faults that are caused by mechanical problems or changes in system parameter which are reflected in the dynamic models. This general deep learning technique can be tailored to detect many defects or faults in the manufacturing and/or operation of autonomous vehicles.

TuesA2 UA1220
Data Science

Chair: Prof. Weng Yang Sichuan University, China

15:20 - 15:35 TuesA2.1

Terroist Group Classification of Historic Terroist Attacks from The Global Terrorism Database, pp. 237-242.

Ralph Laite Lixar I.T. Inc.
Miguel Lozano Ontario Tech Univ.
Karthik Sankaranarayanan Ontario Tech Univ.

To conduct terrorist group classification of the terrorist attacks performed by unknown terrorist groups, text-based feature generation and logistic regression are used on the Global Terrorism Database (GTD). The model was trained and tested using stratified cross-validation with 10 folds, and a train-test-split of 75/25, achieving a median accuracy of 88%. Additionally, miscellaneous exploratory analysis is performed to capture and interpret macrotrends and characteristics that we present in the labeled and unlabeled GTD attack data.

15:35 - 15:50 TuesA2.2

Research on the Judgment and Detection of Battery PSD Curve Big Data System, pp. 345-349.

Rui-Jun Li Neusoft Inst. Guangdong
Shinn-Dar Wu Neusoft Inst. Guangdong, USA Saint Paul's College & DePaul Univ
Jue-Jia Chen Neusoft Inst. Guangdong
Jun-Wei Huang Neusoft Inst. Guangdong
Ying-Lin Wen Neusoft Inst. Guangdong.
Chen-Hsiang Chao SunReadFarm Tech. Co.,Ltd
Xiong-Dong Sun Neusoft Inst. Guangdong.

With the explosive growth of new energy vehicles, 4~5years later, there will be a lot of decommissioned battery problems around the world. In order to promote the cascade utilization of power battery, the system of recycle and utilization of power battery is established to reduce the frequency of safety accidents of inferior battery products in the market, and to improve the control and reliability of power battery system and improve the power battery industry chain. Therefore, contraposing "battery PSD big data system judgment and detection" technology, and because of the interface signal, we will compile the soft code, and then independently set up the back-end data analysis, and develop the App program intelligent platform, With the signal and platform supporting each other, It can solve the problem of intelligent power balance, and discuss the demand integration of users or enterprises. Related information can be transmitted among battery module management units through communication protocols such as CAN,SPI or UART, and further information can be transferred to the upper layer of the battery management system control core (Battery Control Unit, BCU), According to this information, BCU can realize the control strategy of battery management, warning and safety protection.

15:50 - 16:05 TuesA2.3

Research on Module Design of PSD Big Data Platform, pp. 350-353.

Li-You Chen Neusoft Inst. Guangdong.
Shinn-Dar Wu Neusoft Inst. Guangdong, USA Saint Paul's College & DePaul Univ
Hao-Jian Huang Neusoft Inst. Guangdong.
Xiang-Ting Chen Neusoft Inst. Guangdong.
Wei-Xin Jiang Neusoft Inst. Guangdong.
Yea-Chyi Lin National Cheng Kung Univ.
Yu-Lin Yang National Chin-Yi Univ.

In recent years, the serious environmental problems, the depletion of ozone layer, the greenhouse effect, the oil crisis, the development and utilization of new energy sources have become more important issues in the world, and the development of electric vehicles has been the target of global development. In order to meet the demand of the times, and in line with the technical trend of low-carbon life and energy conservation and environmental protection issues, a new management of the battery life of electric vehicles has been carried out in accordance with the technical trend of low-carbon life and energy conservation and environmental protection issues. Because the design of BMS and EMS is different, then its application in series and parallel of batteries is also different because of the state of batteries, which often results in insufficient battery power, especially when the battery is left with 20% or 10% of the battery, People are scared because they don't know how long the remaining 20% or 10% will be able to use. Therefore, this study not only can make users understand the current power situation, but can give a big data feedback integration of the functions of the Internet in the analysis of PSD curve (developed by ShinnDar) , extend battery charging pricing, and have security positioning functions, and so on. It can also be used to protect the battery effectively, avoid damage due to overvoltage or overcurrent, prolong its service life effectively,which let consumers use it at ease.

16:05 - 16:20 TuesA2.4

Comparing Genetic Programming with Other Data Mining Techniques on Prediction Models, pp. 785-791.

Fateme Azimlu Ontario Tech Univ.
Shahryar Rahnamayan Ontario Tech Univ.
Masoud Makrehchi Ontario Tech Univ.
Naveen Kalra Ontario Tech Univ.

Prediction is one of the most important tasks in the machine learning field. Data scientists employ various learning methods to find the most appropriate and accurate model for each family of applications or dataset. This study compares the symbolic regression utilizing genetic programming (GP), with conventional machine learning techniques. In cases, it is required to model an unknown, poorly understood, and/or complicated system. In these cases, we utilize genetic programming to generate a symbolic model without using any pre-known model. In this paper, the GP is studied as a tool for prediction in different types of datasets and conducted experiments to verify the superiority of GP over conventional models in certain conditions and datasets. The accuracy of GP-based regression results are compared with other machine learning techniques, and are found to be more accurate in certain conditions.

16:20 - 16:35 TuesA2.5

Proposing a Pareto-VIKOR Ranking Method for Enhancing Parallel Coordinates Visualization, pp. 895-902.

Khiria Aldwib Ontario Tech Univ.
Azam Asilian Bidgoli Ontario Tech Univ.
Shahryar Rahnamayan, SMIEEE Ontario Tech Univ.
Amin Ibrahim Ontario Tech Univ.

Data visualization is an essential step in data science to get better interpretation to analyse data. The parallel coordinates plot (PCP) is a well-known method to visualize high-dimensional $(D>3)$ data without dimension reduction. In large-scale datasest, PCP may fail because of many clutters and crossing lines in the plot. The order of coordinates is one of the parameters in PCP which can affect on the performance of this method. Finding the best order can be considered as a multi-criteria comparison task based on different metrics such as minimizing the number of crossing lines between adjacent coordinates and the maximizing the pairwise correlation coef?cient values. In order to improve the visualization of data using PCP, this paper presents a multi-metric Pareto-VIKOR ranking (PVRPCP), a new method which determines the best order of coordinates based on optimizing two or more metrics. The method consists of evaluating all possible coordinates permutations based on evaluation metrics and applying non-dominated sorting algorithm (NDS) to obtain the Pareto-front ranks (PF). The solutions on each Pareto front are then ranked by VIKOR, a multi-criteria decision making measure. In order to evaluate the effectiveness of the the proposed method in data visualization, we also designed several multi-dimensional benchmarks to represent the effect of ordering in PCP. In addition to author-created benchmarks, several multi-objective function benchmarks and real-world datasets are utilized to evaluate the proposed method. The experimental results show that the PVRPCP offers improved PCP visualization compared to the original order in terms of both utilized metrics.

WedA1 UA1120
Data Science & AI-II

Chair: Prof. Lin Xianke Ontario Tech University, Canada

8:30 - 8:45 WedA1.1

A Machine Learning Framework for Length of Stay Prediction in Emergency Healthcare Services Department, pp. 539-549.

Imeh Umoren Akwa Ibom State Univ.
Kingsley Udonyah Akwa Ibom State Univ.
Etebong Isong Akwa Ibom State Univ.

Estimating Patient Length of Stay (LOS) in healthcare systems is significant for seemly decision making regarding capacity planning, resource allocation and scheduling. In most Emergency Healthcare Services Departments, the commonly used indicators to measuring performance include length of stay, waiting time, resource utilization and number of patients treated. The existing challenge of Prolonged Hospital Length of Stay (PHLOS), usually experienced in most healthcare system indicates constant surge, resulting in over demand of Healthcare resources (facilities and personnel). In this paper, a Machine Learning (ML) framework is proposed to predict patient Length of Stay (LOS) in emergency health care services departments. First, a study of the emergency health care services in the University of Uyo Teaching Hospital was conducted to gain insights into the operations of the emergency department and the contributions as well as limitations of important system parameters. Second, an analysis of several relevant factors such as Severity of Illness or Emergency Cases (SIC) was carried out to assess its performance. Third, the proposed ML framework was then implemented using the Intuitionistic Type-2 Fuzzy Logic System (IT2-FLS). Results of the model demonstrate the importance of ML in evaluating the performance of healthcare systems for efficient LOS Prediction Provisioning.

8:45 - 9:00 WedA1.2

Task-oriented data collecting strategy in vehicular crowdsensing, pp. 761-766.

Yanglong Sun Xiamen Univ.
Yuliang Tang Xiamen Univ.

Data collection is the base of implementing some attractive novel applications in vehicular networks, such as real-time map updating and dynamic navigation. Crowdsensing is a good way to deploy such data collection task among a huge amount of vehicles to solve the vehicle selection problem. However, uploading sensing data is still challenged due to the high cost and shortage of communication resource. This paper explored the uploading strategy for vehicular corwdsensing, where the sensing task contains several subtasks that occupied by vehicles and needs to be completed in a limited time. A comprehensive cost model was designed and we utilized a greedy algorithm to find data giver vehicles for every subtask with minimized cost. Finally, we analyzed the influence of vehicle's communication capacity and different cost structure.

9:00 - 9:15 WedA1.3

Analyzing Concreteness in Introspection to Promote Engagement in Healthful Exercises, pp. 872-877.

Takuya Mori Ritsumeikan Univ.
Hiromitsu Shimakawa Ritsumeikan Univ.
Fumiko Harada Connect Dot Ltd.

To improve health, we need to keep engaging in exercise. Keeping the engagement is a difficult task. However, exercise planning followed by introspection of the engagement are likely to lead to keeping the engagement. Considering what happened in exercises, we adjust exercise plans

into feasible ones. The paper proposes a method to facilitate users to plan exercises and look back the engagement. Based on Harada method to breaking a large purpose into more specific goals, the proposed method makes users build exercise plans for health. According to this plan, users engage in exercises. The method obliges users to describe a diary after the engagement. A diary description reviewing the outcome of the exercise allows the user to think of results and reasons for the outcome. The paper reveals relationships of diaries with improvement engagement with text mining.

9:15 - 9:30 WedA1.4

Automated Classification of Alzheimer's Disease using Deep Neural Network (DNN) by Random Forest Feature Elimination, pp. 1044-1047.

Dilek Manzak — Sakarya Univ.
G?k?en ?etinel — Sakarya Univ.
Ali Manzak — Univ. of Detroit Mercy

Determining Alzheimer's Disease (AD) in its early stages is very important to prepare proper care for the patient. In this study, we aimed to create fast and accurate automated classification system to determine AD with the minimum data collected from the patient. Magnetic Resonance Imaging (MRI) is widely used to diagnose AD. When the cost of the technique and risks of the procedures are considered, there is a need for different solutions. With the availability of neural network chips, it is even possible to build portable devices for Alzheimer's detection. We propose fast and successful method to detect Alzheimer using Deep Neural Network (DNN). To reduce the complexity of the algorithm, Random Forest method was used to eliminate some of the features. Success of Random Forest to eliminate the features and success of DNN to detect AD are discussed.

9:30 - 9:45 WedA1.5

LightGBM: an Effective Decision Tree Gradient Boosting Method to Predict Customer Loyalty in the Finance Industry, pp. 1105-1110.

Marcos Roberto Machado — Ontario Tech Univ.
Salma Karray — Ontario Tech Univ.
Ivaldo Tributino de Sousa — Federal Univ. of Ceara

This study presents an implementation of a Machine Learning model to predict customer loyalty for a financial company. We compare the accuracy of two Gradient Boosting Decision Tree Models: XGBoosting and the LightGBM algorithm, which has not yet been used for customer loyalty prediction. We apply these methods to predict credit card customers' loyalty scores for a financial company. The dataset has been made available through a Kaggle's competition. We assess customer loyalty prediction accuracy through RMSE and find that LightGBM performs better than XGBoosting.

WedA2 — UA1140
Computer Science & Application-I

Chair: Prof. Jonathan Li — Department of Geography & Environmental Management, Univ. of Waterloo, Canada

8:30 - 8:45 WedA2.1

A Web Based Interactive System to Promote ICT Education in Bangladesh, pp. 77-80.

Mumtahina Huda Mahi — North South Univ.
Tasnim Tarannoom — North South Univ.
Md. Anisul Islam — North South Univ.
Dr. Mohammad Monirujjaman Khan — North South Univ.

This paper presents the design and the implementation of a web based interactive system to promote (teaching and learning) ICT education (for both teachers and students) in the secondary and higher secondary levels in Bangladesh. It can be categorized as a web-based educational information storing and self-evaluating software. The system has been designed in such a manner that takes care of all the needs of students as well as teachers of both rural and urban areas and will provide facilities to solve their problems. This interactive learning system will help the teachers to prepare their lessons and the students to help themselves learning the ICT subjects of SSC and HSC levels. This system will be accessible via the Internet and available to the target population through laptop, PC, mobile or other devices with 3G or broadband connection. The system includes content designing, web portal development and an Android mobile application development.

8:45 - 9:00 WedA2.2

Application of Graphical Hardware Programming in Non-Computer Major, pp. 300-303.

Yongqiang Chen — Tsinghua Univ.
Xi Yuan — Tsinghua Univ.
Shuzhen Tian — Tsinghua Univ.
Yang Ding — Shandong Univ.

With the increasing demand for computer application scenarios, it is necessary to develop computer software and hardware systems conveniently and quickly, which can be applied to specific occasions and scientific research and production activities of specific specialties. Learning computer software and hardware programming is a long and complex process, which requires a kind of software that enables non-computer specialists to develop what they want and suitable for their work. Hardware systems, such as biology majors, want a stable closed self-circulating ecosystem. This requires a system that includes computer software and hardware, and needs to be programmed. In the process of applying this system, we need to adjust frequently to make changes in functions or parameters, which requires professional computer talents to do. [1] With the emergence of new software and hardware programming methods such as scratch and Arduino, our computer programming ideas have been changed. The graphical programming ideas of scratch have saved a lot of people from learning computer programming grammar. Arduino is a very convenient hardware programming miniaturization platform. Combining the two, people who are not computer majors can be freed from the complex computer learning process, and they can easily and quickly build the practical system they want. This has greatly liberated people, and time can be spent mainly on research or work to be done. This paper mainly introduces the software and hardware environment of graphical programming, and then gives several practical examples to facilitate people's reference.?

9:00 - 9:15 WedA2.3

Static Analyzers and Potential Future Research Directions for Scala: An Overview, pp. 320-325.

Eljose E Sajan — Univ. of Houston
Yunpeng Zhang — Univ. of Houston
Liang-Chieh Cheng — Univ. of Houston

Static analyzers are tool-sets which are proving to be indispensable to modern programmers. These enable the programmers to detect possible errors and security defects present in the current code base within the implementation phase of the development cycle; rather than relying on a standalone testing phase. Static analyzers typically highlight possible defects within the 'static' source code and thus doesnot require the source code to be compiled or executed. The Scala programming language has been gaining wider adoption across various industries in recent years. With such a wide adoption of tools of this nature, this paper presents an overview on the static analysis tools available, both commercial and open-source, for the Scala programming language. This paper discusses in detail about the types of defects that each of these tools can detect, limitations of these tools and also provide potential research direction that can improve the current state of static analyzers for the Scala programming language.?

9:15 - 9:30 WedA2.4

Docker-based Cloud System for Computer Programming Labs, pp. 622-626.

Minsu Chae Soonchunhyang Univ.
Sangwook Han Soonchunhyang Univ.
Hwamin Lee Soonchunhyang Univ.

Recently, the importance of software education has been emphasized all over the world. In Korea, software education has been introduced for elementary schools that have applied for software education since 2015, and software education has been adopted as a regular subject in all elementary schools since 2017. As the importance of the software industry grows, interest in coding education is increasing. In Korea, students must complete 16 hours of instruction in elementary school and 34 hours in middle school from 2019. In Korea, however, there are not enough professional teachers who majored in software, and many schools have poor laboratory environments. For successful software coding education, a basic hands-on environment should be supported. It is also difficult for the teacher to analyze and score all students' program sources during class. In this paper, we propose a computer labs management system that can be executed within seconds by using images already generated by Docker for software education at school. And we implemented a programming practice management system using Docker. Our system provides the ability for teachers to automatically identify and score students' source code as they conduct coding training.

9:30 - 9:45 WedA2.5

Cultivation of innovative talent engineering practice ability under the background of Emerging Engineering Education: A Case Study of Internet of Things Teaching, pp. 720-724.

Juan Luo Hunan Univ.
Yanliu Zheng Hunan Univ.
Bin Fu Hunan Univ.

The construction of Emerging Engineering Education requires the cultivation of professional and technical talents, innovative talents and high-quality talents who can adapt to the development of the industry. Providing intellectual support and talent guarantee for China to seize the commanding heights of science and technology strategy. Based on the innovative talents engineering practice ability training needs to meet the requirements of this major to train students to solve complex engineering problems, and insufficient in the teaching process of the existing Internet of Things engineering, Hunan University has established a set of "doing middle learning" innovative talents engineering practice teaching system from software design ability, computer system to comprehensive design. Decomposing engineering practice ability into four-year teaching tasks, combined with the actual situation of running a school, gave specific measures for engineering practice ability training and implemented it in the Internet of Things engineering, and achieved good results.

9:45 - 10:00 WedA2.6

Research on Parallel Detection of Equipment Monitoring Signals of Substation based on Improved ALOHA-Algorithm, pp. 1008-1013.

Hongliang Wang Kunming Univ. of Sci. & Tech.
Jie Zhou Kunming Univ. of Sci. & Tech.
Zhijian Liu Kunming Univ. of Sci. & Tech.

In order to solve the collision problem in the process of identifying a large number of monitoring signals when RFID wireless system is applied to the equipment monitoring of mountainous substations, the RFID wireless system architecture for equipment monitoring of mountainous substations is established. On the basis of the traditional frame-time slot ALOHA algorithm, a multi-antenna RFID reader is used to realize the parallel recognition of multi-signals in a single slot. Then the upper envelope of each throughput curve is taken according to the frame length N, and the frame length is adjusted at the intersection point. The signal flow is divided into groups, and the final algorithm flow chart is obtained. The simulation results show that the throughput can be improved up to 97.3% after parallel recognition, but the recognition rate S is limited by frame length N and signal number n; the recognition rate S can be maintained above 90% after frame length adjustment; and the recognition rate S at the tail of envelope can be reduced sharply with the increase of signal number n after periodic grouping. The simulation results show that the improved parallel recognition ALOHA algorithm not only improves the recognition rate, but also keeps a relatively stable recognition rate with the increase of the monitoring signal. The recognition rate is increased from 34% to 90% by the traditional frame-slot ALOHA algorithm, which greatly improves the monitoring signal of substation equipment. The probability of successful identification guarantees the safe and stable operation of mountain substations.

WedA3 UA1220
Education & Technology-I

Chair: Prof. Hong WenXing Xiamen University, China

8:30 - 8:45 WedA3.1

Application of grouped flipped classroom to two-year actual class and its statistical evaluation, pp. 194-199.

Katsuyuki Umezawa Shonan Inst. of Tech.
Takashi Ishida Takasaki City Univ. of Economics
Makoto Nakazawa Junior College of Aizu
Shigeichi Hirasawa Waseda Univ.

In a flipped classroom, the roles of a classroom and homework are reversed. We propose a method for increasing the effectiveness of the flipped classroom lessons based on the self-study log information. Specifically, when students study by e-learning at home, we collect and analyze their learning logs and then classify students into groups based on their study time and the degree of understanding of the material. We call our proposed method a grouped flipped classroom. We applied it to actual lessons during 16 weeks in the autumn semesters of 2017 and 2018 at the Shonan Institute of Technology. The results revealed that students' performance improved after the grouped flipped classroom lessons, especially in the

group of students who had low understanding during self-study: there was a statistically significant difference between their average scores in the tests after the self-study and after the face-to-face lessons. In addition, the average scores in the tests after the face-to-face lessons were higher for students in the grouped flipped classroom than for students in conventional style classes (lecture style class and mixed ability class).

8:45 - 9:00 WedA3.2

Virtual Simulation Experiments of Train Operation Control for High-speed Railway Based on Data and Scenarios, pp. 585-589.

Yangping Wang — Lanzhou Jiaotong Univ. Gansu Provincial Engineering Research Center for Artificial Intelligence & Graphic & Image Processing
Biao Yue — Lanzhou Jiaotong Univ. Gansu Provincial Engineering Research Center for Artificial Intelligence & Graphic & Image Processing
Jiu Yong — Lanzhou Jiaotong Univ.
Wenrun Wang — Lanzhou Jiaotong Univ.

The high-speed train operation control system is the key technology and core equipment to ensure the safety and improve transportation efficiency of high-speed railways. Aiming at the problems of high risk, high cost and difficult to carry out practical teaching in field practice, this experiment uses virtual simulation technology to integrate the Computer Based Interlocking, Train Control Center, Radio Block Center and On-board equipment on the basis of deep integration of actual engineering data, so as to truly reproduce the whole process of high-speed railway train control. According to the professional direction and knowledge needs, students can complete basic, designed and Innovative experiments, master the key knowledge points of professional courses, and enhance the ability of engineering application and innovation.

9:00 - 9:15 WedA3.3

Research on Learners' Eye Movement Behavior for Online Video Courses, pp. 661-666.

Yuanhan Wang — Huazhong Univ. of Sci. & Tech.
Wei Xu — Huazhong Univ. of Sci. & Tech.
Xiaoqing Zhan — Huazhong Univ. of Sci. & Tech.
Wenqing Cheng — Huazhong Univ. of Sci. & Tech.
Wei Liu — Huazhong Univ. of Sci. & Tech.
Wenqi Liu — Huazhong Univ. of Sci. & Tech.

Among the many presentation styles of online video courses, although Khan-style video has been proved to be effective by relevant research, it does not replace the dominant position of traditional PPT-style video in China. We use the method of questionnaire survey and eye movement experiment to compare and analyze Khan-style video and PPT-style video. For experimental materials, we use the "Qing MOOC" platform developed by our own lab to enhance the interactive effect of Khan-style video. In terms of experimental methods, we first propose the Speech-Vision Center model, which realizes more accurate statistical analysis of learners' eye movement behavior in learning process, and then develop the eye movement experimental system based on this model and design comparative experiments. Results show that compared with PPT-style video, Khan-style video is better at helping learners complete the learning process and improve the learning effects.

9:15 - 9:30 WedA3.4

Research on Mixed Digital Logic Experiment Mode, pp. 676-680.

Yuchao Gao — Tsinghua Univ.
Ninghan Zheng — Tsinghua Univ.
Chengbin Quan — Tsinghua Univ.
Shanshan Li — Tsinghua Univ.

Digital logic circuit is a basic compulsory course for information majors. It is also the first hardware theory course for students to contact, which lays the foundation for the follow-up professional courses. The course of digital logic circuit itself has the characteristics of theory and practice. It is especially important to transform the theory into practice. The digital logic circuit experiment class can help students understand theoretical knowledge. It is a bridge to transform theory into practice. Scientific mode and reasonable experimental content can promote students' understanding and application of theoretical knowledge. Therefore, the digital logic circuit experiment course is a very Effective practical teaching methods. The experimental course of digital logic circuit of Tsinghua University adopts the experimental mode of mixing the basic simple digital integrated circuit and programmable logic device.[1]This mode can not only enhance students' understanding of theoretical knowledge, but also improve the ability of students to debug hardware. After two years of feedback on experimental teaching results, the experimental form using mixed mode has been recognized by most students.

9:30 - 9:45 WedA3.5

Research on the Formulation Method of Higher Vocational Professional Training Program under the OBE-CDIO Concept, pp. 868-871.

Yue Jia — Dalian Neusoft Univ. of Info.
Yandong Wen — Dalian Neusoft Univ. of Info.
Xinghui Wang — Dalian Neusoft Univ. of Info.

Based on the OBE-CDIO education concept and the post-responsibility-capability-course as a clue, the method of formulating the higher vocational professional training plan under the OBE-CDIO concept was developed and formulated. The research of the subject is based on the advanced teaching concept, with the goal of rationally setting up the curriculum and achieving continuous improvement of the training program, to explore the expected "learning output" based on the OBE concept, and to obtain the "learning output" at the professional level and the curriculum level. The key points are to break through the problem of the positioning of professional talents in higher vocational colleges, to achieve all the evidence-based and rational-based principles, and finally to standardize the process and methods for the formulation of higher vocational professional training programs under the OBE-CDIO concept.

9:45 - 10:00 WedA3.6

Extraction of Poor Learning Items with Automatic Labeling in Fill-in-the-blank Test, pp. 907-912.

Ryosuke Goshima — Ritsumeikan Univ.
Hiromitsu Shimakawa — Ritsumeikan Univ.
Fumiko Harada — Connect Dot Ltd.
Dinh Dong Phuong — Ritsumeikan Univ.

In this paper, we propose a method to automate the systematic analysis of grading results in fill-in-the-blank tests. The proposed method evaluates appropriateness for labels from learning histories of learners to find the most suitable labels for blanks. A set of the most suitable labels to the

blanks is used to create a graph which shows a variation of understanding levels of the learners. The method applies cluster analysis to the graphs in order to classify the learners with understanding levels for programming. It is implied that the proposed method classifies learners into 6 categories according to the understanding levels for programming.

WedB1 UA1120
Computer Science & Application-II

Chair: Prof. Samantha Thelijjagoda — Sri Lanka Inst. of Information Technology, Sri Lanka

10:20 - 10:35 WedB1.1

Research on Transmission Schemes of Massive MIMO Enabled SWIPT Systems, pp. 155-160.

Yifeng Zhao — Xiamen Univ.
Xueting Xu — Xiamen Univ.
Siying Wu — Xiamen Univ.
Lianfen Huang — Xiamen Univ.

Due to the development of the 5th generation network, the high power wireless devices, such as Internet of things network devices, have become part and parcel of some new domain. The simultaneous wireless information and power transfer (SWIPT) system can transmit information while harvesting energy. Although introducing massive multiple-input multiple-output (MIMO) technologies into SWIPT systems can reduce propagation loss, there still exists the bottleneck about a trade-off between energy and information, that is, the information decoding users suppress interference while the energy harvesting users take advantage of it. In this paper, we propose a time-division (TD) transmission scheme and a power-splitting (PS) one, which all can increase Rate-Energy (R-E) region, a novel method to evaluate the system performance. We find the optimal allocation factors for schemes, which are crucial in balancing data rate and harvest power. Simulation results demonstrate that the PS scheme has larger R-E region for massive MIMO enabled SWIPT system, which represents a better energy efficiency.

10:35 - 10:50 WedB1.2

Application of Intelligent Technology in Animal Husbandry and Aquaculture Industry, pp. 335-339.

Yongqiang Chen — Tsinghua Univ.
Shaofang Li — Yantai Univ.
Hongmei Liu — CEC Huada Electronic Design Co., Ltd
Pin Tao — Tsinghua Univ.
Yilin Chen — Tianjin Polytechnic Univ.

With the popularization of UAV technology, information technology, artificial intelligence and automation technology, it is a more realistic problem to apply these modern technological means to the traditional aquaculture industry. This will greatly liberate human resources, improve modern production efficiency, and will be of great help to improve the output, product quality and other conveniences. Applying artificial intelligence to modern aquaculture technology can intelligently identify animals of different weights and stages, feed differently, and improve the output rate of high-quality feeding animals. On the basis of investigation and Research on different types of sheep houses, the paper formulates optimization and improvement plan for the shortcomings of existing sheep houses, applies information technology in the field of animal husbandry science, improves the automation and intelligence level of goat houses, through the cross-disciplines of automated feeding, precision feeding, automatic door closure, photographic weighting, UAV sheep farm patrol, and herd behavior image analysis, etc. The research and development of new technology has developed a new sheep house for meat goats suitable for use in Agricultural Area, carried out research on microclimate environment regulation and control of different types of sheep houses, formulated corresponding control schemes, and carried out demonstration application in the project area to improve the health status of sheep and increase production efficiency. KEYWORDS——Artificial intelligence, information technology Aquaculture, Internet of things.

10:50 - 11:05 WedB1.3

Design and Implementation of Human-Computer Interaction Based on User Experience for Dynamic Mathematics Software, pp. 428-433.

Ruxian Chen — Guangzhou Univ.
Yongsheng Rao — Guangzhou Univ.
Ruiqi Cai — Guangzhou Univ.
Xiaohong Shi — Guangzhou Univ.
Ying Wang — South China Inst. of Software Eng.
Yu Zou — Guangzhou Univ.

Human-computer interaction (HCI) serves as a critical mediator between users and dynamic mathematics software (DMS), which directly affects users in effective and emotional experience. To improve user experience, this paper puts forward eight HCI design principles for DMS based on user experience with the concept of clarity, reliability, efficiency and motivation. The principles were applied into NetPad, a web-based DMS, for the purpose of effectiveness validation. The experiment suggested that the eight principles are beneficial to improve user experience, making users feel friendly and raising the efficiency of DMS in teaching as well.

11:05 - 11:20 WedB1.4

NetPadBrowser:An Offline Browser for Web-Based Dynamic Geometric Resources, pp. 434-438.

Ruiqi Cai — Guangzhou Univ.
Yongsheng Rao — Guangzhou Univ.
Jie Wang — Guangzhou Univ.
Hao Guan — Univ. of Chinese Academy of Sciences
Xiaohong Shi — Guangzhou Univ.
Ying Wang — South China Inst. of Software Eng.

NetPad is a web-based dynamic geometry software (DGS) which can run on various terminals in browsers developed by HTML5. The use of NetPad depends on the Internet. When the Internet is not available, users cannot use it. To address this problem, this paper designs and implements a browser, NetPadBrowser, to support exploring the NetPad resources offline. NetPadBrowser is based on the Electron framework and web front-end development technology. It is packaged and deployed on the Windows operation system to verify the feasibility of this development mode, and the mode can be easily ported to the Mac operation system.

11:20 - 11:35 WedB1.5

Research and Development of a Linear Graph-based MATLAB Toolbox, pp. 942-947.

Eric McCormick — Ontario Tech Univ.
Haoxiang Lang — Ontario Tech Univ.
Clarence W. de Silva — The Univ. of British Columbia

This paper presents a new MATLAB-based software toolbox, called LGtheory, which provides a robust and automated method of evaluating Linear Graph (LG) models of multi-domain engineering systems for the primary energy domains (electrical, mechanical, hydraulic, and thermal). The necessary background on the major concepts of LG approach is presented along with a description of how the different LG processes are automated using MATLAB software. These processes are demonstrated through the extraction of the statespace model of an example system consisting of a DC motor with an inertial load. The results of this system output by the LGtheory Toolbox are simulated and compared against the same model as constructed in Simulink Simscape. This comparison demonstrates that LGtheory is capable of producing accurate state-space models of multi-domain dynamic systems.

WedB2 — UA1140
Education & Technology-II

Chair: Prof. Hu Jie — Zhejiang University, China

10:20 - 10:35 — WedB2.1

The influence of ICT attitudes on closing the reading literacy gap of students from different economic, social and cultural backgrounds, pp. 60-64.

Ya Xiao — Zhejiang Univ.
Jie Hu — Zhejiang Univ.

This study examines the moderation effect of students' attitudinal factors related to information and communication technology (ICT) on the relationship between their economic, social and cultural status and their reading literacy. Four composite variables concerning students' attitudes towards ICT, i.e., interest in ICT, perceived competence in using ICT, perceived autonomy related to ICT use, ICT use as a topic in social interaction based on the ICT familiarity questionnaire issued by the Program for International Student Assessment (PISA). A moderation model is applied to analyze the moderation effect of these four ICT attitudinal factors on the gap reading literacy among Chinese young teenagers caused by their different economic, social and cultural statuses. A total, of 9,561 samples from 268 schools in mainland China are drawn from the latest round of PISA in 2015. Two significant results are found: (1) students' ICT attitudinal factors do have significant moderation effect on the relationship between their economic, social and cultural status and their reading literacy; (2) the high-level of ICT interest, perceived competence, perceived autonomy and ICT use in social interaction might close the gap in the reading literacy between students from high- and low- economic, social and cultural backgrounds. The findings shed light on the promotion of educational equality and the improvement of ICT-assisted reading education.

10:35 - 10:50 — WedB2.2

Preliminary Study on Student's Assessment in Programming Courses, pp. 81-84.

Anwar Abdalbari — Ontario Tech Univ.
Khalid Hafeez — Ontario Tech Univ.

Assessment is a crucial component of learning because it helps students engage themselves in the learning process. Furthermore, assessments motivate students to become more familiar with the topic. The proposed preliminary study investigates different assessment techniques of programming courses in higher education. The techniques we used in this study include multiple choice and short answer questions. The study shows that students were doing well in multiple-choice questions and had some difficulties in short answer questions in regards to programming language courses such as CPP and Object Oriented Programming using Java.

10:50 - 11:05 — WedB2.3

The Effects of ICT Use on Chinese College Students' Study Behavior in B-learning, pp. 103-107.

Hong Zhao — Nankai Univ.
Yun Guo — Nankai Univ.
Kai Wang — Nankai Univ.
Mingxiao Lu — Nankai Univ.
Xiaoyu Yan — Nankai Univ.

Research has shown that b-learning model is more effective than the traditional face-to-face teaching style in improving students' achievement. Although newly introduced ICT is the major factor that makes b-learning different from traditional pedagogy, ICT is not the only factor that influence learning outcome. The intrinsic association between b-learning adoption and learning outcome is quite complicated. Thus we extracted four main factors during b-learning process: technology-related factor, teacher-related factor, students' pre-class study behavior, and after-class behavior. According to the four factors' intrinsic association, we proposed a causal model to explain how these factors were interacted with each other. A sample of 359 participants in Computer Basis b-learning course from a university in northern China was taken part in this study. Structural equation modeling implemented via partial least squares (PLS) was conducted to test the research hypotheses. Finally, 4 among 5 research hypotheses were supported by data: (1) Teachers' in-class instruction can promote students' acceptances of ICT; (2) Higher ICT acceptance leads to better pre-class study behavior; (3) Teachers' in-class instruction has positive impact on students' pre-class study behavior; (4) Students' pre-class and after-class study behavior are consistent; (5) Unexpectedly, ICT acceptance no longer has influence on students' after-class study behavior.

11:05 - 11:20 — WedB2.4

A match method of encircled feature markers on external store model, pp. 533-538.

Dan Zhou — Xihua Univ.
Xiucheng Dong — Xihua Univ.
Fan Zhang — Xihua Univ.
Wei Chen — Xihua Univ.

In the high-speed and complex flow circumstance, the recognition, location and matching of the encircled marker-points on the aircraft external store model are the important basic data for determining the separation characteristics of the model and the flight trajectory. In order to solve the matching problem of the marker-points on the small-sized external store, a algorithm of encoding and decoding with encircling marker-points is proposed. The decoding algorithm calculates the distance of marker-points between head and tail and the direction vector to match the homonymous points. Such algorithm has the advantages of keeping the aerodynamic shape, easy to implement, and low cost. The experiments

show that the decoding accuracy is higher than 94% in circumstance of long distance and large field of view, complex background and high ambiguity. In addition, the efficiency of decoding is also improved. By applying the decoding with encircling marker-points in the monocular vision measurement system, the experiments show that the proposed method can achieve fast recognition and high-precision matching. It has engineering practical value.

11:20 - 11:35 WedB2.5

"Digital Show-How": Extreme Active Learning for Introductory Programming, pp. 755-760.

David Stotts Univ. of North Carolina

For the past ten years we have employed active learning methods in introductory programming classes at UNC Chapel Hill. In this report we present experience with one such method we call "digital show-how", in which students learn to program apprentice-fashion, by doing programming in class. Digital show-how is extreme active learning. Students do a lot of programming, in real-time, in class as the instructor shows them how. They get instant feedback on their work, and so have constant low-stakes assessments. We describe the goals for the classes, the tools and methods we have developed to support digital show-how, and the results we have measured on how well the goals are being met.

11:35 - 11:50 WedB2.6

THINPAD Experimental Platform for Computer Hardware Experiment, pp. 792-795.

Shanshan Li Tsinghua Univ.
Weidong Liu Tsinghua Univ.

Computer hardware courses in computer course system occupy an important position, but the existing experimental platforms can not well satisfy the experimental teaching of all colleges and universities. Through the analysis of the current status about computer hardware experimental platforms, this paper in view of the existing problems, describes a way using mainstream hardware design techniques to achieve a more comprehensive, more stable, more powerful, easier to use, cheaper experimental platform. This platform is versatility, high flexibility, abundant interface, with a good operational efficiency and interactivity, support the experimental needs of a number of hardware courses, this platform will play an active role to improve the quality of teaching.

WedC1 UA1120
e-Society

Chair: Dr. Cui Binyue Hebei Univ. of Economics & Business, China

13:30 - 13:45 WedC1.1

The Impact of Social Media Emotions and Behavioral Participation on Destination Image: A Case of Museum Image Mining, pp. 590-595.

Yulin Chen Tamkang Univ.
Wei Zhou Beijing Jiaotong Univ.
Binyue Cui Hebei Univ. of Economics & Business
Yanting Tong Wuhan Univ. of Tech.

This study is based on different groups of fans and brand positioning. It selects the social media images of three well-known museums to explain the needs of different fan groups with respect to destination images and addresses the current lack of discussion on museum social media management. In addition, this study combines social media and image-analysis technology by using a destination image–emotional participation/behavioral participation framework for analysis. This study collected data from posts based on conditions in Facebook's terms of service. After collecting image API post data, this study organized and categorized types of data: time, like data, share date, comment data, and emotion data. A total of 2,796 image posts were crawled between June 1, 2016, and May 31, 2018. Based on the research results, the three museums selected by this study were found to demonstrate the concept of using destination images to construct brand image, using non-textual descriptions to reach different target groups. At the same time, different types of destination image are provided to meet the needs of fans in different regions, achieving cross-language and cross-cultural social media communication, thus quickly increasing the attention and interest of visitors and guiding users to actively promote their favorite images, reducing the distance between visitors and brands.

13:45 - 14:00 WedC1.2

An Innovative Hardware Bridging Between Education and Industry, pp. 703-708.

Ha Quang Thanh Ngo HCMC Univ. of Tech.
Thanh Phuong Nguyen Ho Chi Minh City Univ. of Tech. (HUTECH)
Hung Nguyen Ho Chi Minh City Univ. of Tech. (HUTECH)
Ha Quang Thinh Ngo Vietnam National Univ. Ho Chi Minh city (VNU-HCM)

Together with the significant leap in technologies, the interference among them make our lives more plentiful. Only a lone major could not last in current era. Instead of that, multidisciplinary approach becomes a novel trend in industrial evolution. In this paper, the collaboration in various fields in one platform is introduced as successful multidisciplinary model. All fields of study profit from this shared hardware, such as cost saving, obsessive partnership, municipal culture or communication. In addition, students are enhanced in their behaviors, for example community awareness, discipline knowledge or entrepreneunal mindset

14:00 - 14:15 WedC1.3

Out-of-class Activities: What Have We Been Doing and How We Can Change it for the Future, pp. 714-719.

Muztaba Fuad Winston-Salem State Univ.
Monika Akbar Univ. of Texas at El Paso
Lynn Zubov WSSU
Debzani Deb Winston-salem state Univ.

It is believed that if students are well engaged in the learning process within the classroom, they will continue the learning process independently outside the classroom. To facilitate such out-of-class learning, there is a plethora of traditional techniques with a variety of learning theoretical backgrounds. While out-of-class activities based on these techniques have shown to improve a student's overall quality of learning, traditional activities lack the supervision, instant feedback, and personalization that the current generation of students expects. With the rising cost of college tuition, many of today's students are working more hours outside of an educational setting and therefore need more supervision and encouragement than their predecessors. These factors make traditional out-of-class activities not effective to achieve the desired level of student learning and engagement outside the classroom. The faculty needs to rethink ways to redesign traditional out-of-class activities to make these

activities more effective for this generation of students. This paper presents a review of the literature on and categorization of traditional out-of-class activities. The paper also discusses the results of a survey of what the faculty is doing to engage and continue student learning outside the classroom. Finally, the paper presents a new way of designing and delivering out-of-class activities that have the potential to increase student engagement with the help of instructional scaffolding, interactive activities, and personalization and adaptation.

14:15 - 14:30 WedC1.4

A Method for Creating Assessment Items for Computer Science, pp. 1019-1023.

Shareeda Mohammed — The Univ. of the West Indies
Dr. Permanand Mohan — The Univ. of the West Indies

This paper presents a method for creating assessment items in Computer Science courses. The method is based on Bloom's Taxonomy of Educational Objectives in the Cognitive Domain. The paper shows how the courses in a Computer Science curriculum are divided into the following three categories: problem-solving, theory-based, and both problem-solving and theory-based. A table has been devised recommending a percentage of the questions in an assessment instrument that should target one of the three main cognitive levels of Bloom's Taxonomy. Another table gives examples of questions that can be asked along the different cognitive dimensions. The method has been used for the past three years in an undergraduate Computer Science programme offered by a well-established university in a developing country. Overall, the performance of students in theory-based and problem-solving/theory-based courses has improved. However, the performance of students in problem-solving courses has not improved significantly. This suggests that there are other factors that influence performance in these types of courses which need to be addressed.

WedC2 — UA1140
Computer Assistant Language Learning

13:30 - 13:45 WedC2.1

Computer Assisted Language Learning for Syllable-time Language Exposed Adults who are Learning a new Stress-time Language, pp. 561-566.

Sena Seneviratne — The Univ. of Sydney
Liyanage C De Silva — Univ. Brunei Darussalam
Jie Hu — Zhejiang Univ.
Judith Beveridge — The Univ. of Sydney

In this paper we discuss about a preliminary study which is one of the series of studies conducted to design a computer software system which helps self-educate the spoken English learners. This software system detects English language syllable stress and uses the results to guide the prospective learners towards a successful learning of spoken English.

13:45 - 14:00 WedC2.2

Analysis of Progression of Scratch Users based on their Use of Elementary Patterns, pp. 573-578.

Kashif Amanullah — Univ. of Canterbury
Tim Bell — Univ. of Canterbury

In a stress-time language, it is the utterances with correct word stress and thereby sentence stress which is usually a problem among adult learners. Using the right sentence stress is the key point in a proper communication. For a learner whose vernacular tongue is syllable-time, making mistakes on this area is very common.

14:00 - 14:15 WedC2.3

Thematic Learning-based Full-text Retrieval Research on British and American Journalistic Reading, pp. 611-615.

Jiangxia Yu — Capital Normal Univ.
Aiyuan Su — Univ. of International Relations
Wangyang Liu — CETC Big Data Research Inst. Co., Ltd.
Xu Cheng — CETC Big Data Research Inst. Co., Ltd.
Jing Yang — Univ. of International Relations

As for Journalistic Reading Course teaching, it is rather difficult to retrieve instructive and valuable ones from massive online news. In combination with the actual course requirements, the paper endeavors to adopt thematic learning as a means and attach more importance to such three weight indicators as news title, length and timeliness to redesign weight function on the basis of Lucene full-text retrieval algorithm. The comparative experiments prove that the respective addition of length weight, title weight and timeliness weight guarantees the retrieval precision ratio of the top ten improved by 43.6%, 69.2% and 35.9% than before, and by 94.9% after a simultaneous addition of these three weights. It verifies that the search result of the top ten after improvement is more in line with actual teaching requirements in terms of news length and timeliness.

14:15 - 14:30 WedC2.4

A Unified Multi-label Relationship Learning, pp. 686-691.

Reshma Rastogi — South Asian Univ.
Simran Popli — South Asian Univ.
Nima Dorji Moktan — South Asian Univ.
Sweta Sharma — South Asian Univ.

Multi-label learning belongs to the class of supervised learning wherein each sample is represented by a single instance and is associated with a set of relevant labels. Many real-world applications like medical diagnosis and image classification involve multi-label classification wherein label correlations are essential to the performance of the classifier. To utilize this correlation among labels, in this paper, we propose a novel model termed as Unified Multi-label Relationship Learning (UMRL) which considers the explicit and implicit correlation inherent in data to build an effective learning model. We adopt the Accelerated Gradient Method (AGM) to train the underlying optimization model efficiently. Extensive experimental comparisons to state-of-the-art multi-label algorithms demonstrate the validity and effectiveness of our proposed approach.

14:30 - 14:45 WedC2.5

Segmentation of Punjabi Text into Prosodic Unit, pp. 775-779.

Navdeep Kaur — Government Polytechnic College for Girls

Parninder Singh — Guru Nanak Dev Eng. College

Naturalness of synthesized speech is defined in terms of accurate pronunciation of words, whether the stress is given to the right word and are the nasal sound words are spoken properly. It is the task of text analysis phase of speech synthesizer to generate linguistic representations of written text by considering nasality, stress and pronunciation of words. As there is difference in written and verbalization form of text. So, text analyser performs text normalization i.e. some pre-processing on written text to transform text into its verbalization form. Some pre-processing tasks performed are date expansion, numeral expansion, alphanumeric expansion, abbreviation expansion, and phonological translation. The vowel-consonant sequence of normalized text is generated that is used to guide the process of segmenting the text into prosodic units (graphemes) and generation the linguistic representation of text.

14:45 - 15:00 — WedC2.6

The Hope: An Interactive Mobile Solution to Overcome the Writing, Reading and Speaking Weaknesses of Dyslexia, pp. 808-813.

Samantha Thelijjagoda — Sri Lanka Inst. of Info. Tech.
Mithila Chandrasiri — Sri Lanka Inst. of Info. Tech.
Dilan Hewathudalla — Sri Lanka Inst. of Information Tech.
Pasindu Ranasinghe — Sri Lanka Inst. of Info. Tech.
Isuru Wickramanayake — Sri Lanka Inst. of Info. Tech.

Dyslexia is the most common disorder in the world that have weaknesses in writing, reading and speaking. As a well spread disorder there are several stages of Dyslexia that has to recognize before giving the treatments. The current treatment is known as “Speech Therapy” which is given by a doctor or a therapist in a hospital or in a special education unit. These weaknesses are more wide spread and effects one in five people in the world. Dyslexia also runs in families. It can be recognized in kindergarten but if not it will be a huge disadvantage and will cause difficulties for further studies when the victim grows up. The people who are suffering from Dyslexia are step aside of the society and most of them are not very social and not open to the society. Therefor the treatment has to be creative and unique in order to get it in to the user. This tool named “The Hope” assembles Dyslexia therapies in a graphical and creative way to present the user to make it more accurate. Key content of this research covers selecting the Dyslexia stage, load the therapies and detect gestures and voice. The end result will be mainly based on Artificial Intelligence, Virtual reality, Image processing and Voice recognition technologies. Whoever suffers from Dyslexia or anyone who is willing to improve their writing, reading and speaking skills can use “The Hope” with a parent or a guardian and can get a clear improvement by following the therapies that the application provides daily. Application will provide an appreciation and a reward system to motivate and encourage the user to use the application daily. Following the therapies daily will improve the user skills. This tool lets users easily recognize their writing, reading and speaking weaknesses and will help to overcome them in a creative and accurate way.

TuesP1 — UA1120
Computer Science-I

9:00 - 17:00 — TuesP1.1

Realtime Multi-Person 2D Pose Estimation using ShuffleNet, pp. 17-21.

Chen-Zhi Guan — Nanchang Normal Univ.

This paper analyzes the principles of the realtime multi-person 2D pose estimation, and then describes the design of the new method called Pose-ShuffleNet. The Pose-ShuffleNet is based on the building blocks of ShuffleNet unit and has the architecture of multi-stages and two branches jointly learning parts detection and parts association. The paper presents the comparison results among the method and other state-of-the-art methods, showing Pose-ShuffleNet more suitable for resource-constrained scenarios.

9:00 - 17:00 — TuesP1.2

Research on School Teaching Platform Based on Blockchain Technology, pp. 38-42.

Liping Li — Yunnan Univ. of Finance & Economics
Xiaosong Wu — Yunnan Univ. of Finance & Economics

Blockchain has a good application prospect in the field of education and teaching. To promote the innovation of school education and teaching, this paper analyses the core technology and principle of blockchain, and puts forward its advantages of application in school teaching. Combining with educational practice, this paper explains the composition and function of the framework, core components, and application module in Blockchain Teaching Platform. This article also expounds the method of building Blockchain Teaching Platform, and puts forward some problems and thoughts of the blockchain application in school teaching. Generally speaking, it strives to carry out beneficial research and exploration in the deep integration of information technology and educational practice.

9:00 - 17:00 — TuesP1.3

A High-reliability Network Architecture Based on Parallel Redundancy Protocol, pp. 43-46.

Yue Wang — Beijing Manufacture Experiments Center of Space Tech.
Xu Zhang — Beijing Manufacture Experiments Center of Space Tech.
Dapeng Zhang — Beijing Manufacture Experiments Center of Space Tech.

With the development of aerospace technology, the data requirement has been increased, a high-reliability network is needed. To improve the network reliability, a double-ring structure is proposed and the Parallel Redundancy Protocol (PRP) is adopted. The high-reliability network model is established using OPNET Modeler, and the network performances in system-level and link-level failure mode are simulated. Simulation results demonstrated the designed network architecture provided rapid even seamless recovery in case of link failure or single network breakdown.

9:00 - 17:00 — TuesP1.4

Research on Fine-Grain Model Recognition Based on Branch Feedback Convolution Neural Network, pp. 47-51.

Shijin Li — Yunnan Univ. of Finance & Economics
Ting Shi — Yunnan School of Business, Info. & Eng.
Fushou Tao — Yunnan Univ. of Finance & Economics
Rong Jiang — Yunnan Univ. of Finance & Economics

Fine-grained vehicle identification has a wide range of applications in many fields, and the requirements for recognition accuracy are high in various application scenarios. In this paper, a branch fusion convolutional neural network algorithm for fine-grained car recognition is designed. The VGG16 convolutional neural network is merged with AlexNet to form a bifurcated fusion convolutional neural network. On this basis, the

multi-branch training idea of GoogleNet is cited to make the network model stabilize and converge during training. The network was trained and tested on the CompCars fine-grained car dataset. The correct rate of the test set Top-1 reached 91.29%, and the model was accurate and effective.

9:00 - 17:00 TuesP1.5

The Reform of Computer Organization Course Based on System Concept, pp. 52-55.

Junxiang Gao — Huazhong Agricultural Univ.
Lihua Bie — Huazhong Agricultural Univ.

Computer organization course is at the connection of software and hardware. However, the traditional teaching method usually neglects the association among computer components and the association between this course and the others, which is not conducive to cultivate the students' system concept and ability. This paper carried out the teaching reform oriented to the ability of computer system. The objectives of the course are divided into five aspects of knowledge and ability, and these objectives are supported by specific teaching contents. In practical teaching, a computer system is developed based on MIPS instruction set including CPU, operating system and compiler. In addition, this paper exemplified how to use appropriate teaching methods to help students establish system concept while mastering key knowledge. The teaching reform has significantly improved the effect and formed a replicable teaching model.

9:00 - 17:00 TuesP1.6

A lightweight CaaS private cloud architecture and models for many task computing, pp. 92-96.

Yiyi Xu — Univ. of Tasmania, Guangxi Univ. of Sci. & Tech.
Pengfei Liu — Univ. of Tasmania, Harbin Inst. of Tech., Weihai
Jun Zhao — Guangxi Univ. of Sci. & Tech.

CPU time has long been a remaining problem for large-scale scientific computing. For some less computing-intensive but many-task-computing codes, it may take several weeks or even months to run. With the increase of datasets scale, computing time grows dramatically - this hence can be more and more challenging. To address this problem, most solutions based on ongoing hardware and/or software investment. To address this issue, this research is to make the following contributions to literature: a new "Computing performance first" Computing as a Service (CaaS) model to support scientific computing and contribute as an novel high-performance private cloud computing (HPPCC) method. Efficiency of this approach is demonstrated by experiments with numerical simulation on both with End nodes and without End nodes.

9:00 - 17:00 TuesP1.7

Knowledge Map Completion Method Based on Metric Space and Relational Path, pp. 108-113.

Jie Sun — Hohai Univ.
Guoyan Xu — Hohai Univ.
Yi Cheng — Hohai Univ.
Tianyi Zhuang — Hohai Univ.

Knowledge Graph describes entities and their attributes and relationships in the objective world in a structured way. Aiming at the problem of knowledge imperfection widely existing in the knowledge map, a knowledge representation learning algorithm—PTranSparse, which is based on metric space and relational path, is proposed to complete the knowledge map. This method combines the ability of TranSparse model to process the heterogeneity and unbalance of entity and relationship and PTransE to make full use of the semantic information of relational path to improve the discrimination of knowledge representation learning. Based on the combination of the two models, the relationship types are considered, and the weights associated with the relationship types are added to differentiate the relationship types when entities are projected. Experiments show that, compared with the original models and the existing combination models and methods, this method can effectively improve the link prediction efficiency of the knowledge graph while solving the complex relation reasoning, and ensure a higher accuracy.

9:00 - 17:00 TuesP1.8

A Mobile Intelligent Reading Teaching Annotation System, pp. 114-117.

Tianxiang Feng — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.
Wenxin Pan — Zhejiang Univ. of Sci. & Tech.
Yifan Zhang — Zhejiang Univ. of Sci. & Tech.

In the era of the popularization of the intelligent mobile devices, the field of mobile learning is expanding constantly, which has gradually become one of the most important ways for people to obtain information. Education and digital reading are sustainably developing towards the direction of intelligence. How teachers auxiliary teaching as a guide and how students according to their interests and hobbies for personalized learning has become a pressing problem. Annotated reading can better stimulate students' thinking in reading as a reading method centered on active inquiry, so the project team proposed a mobile intelligent reading teaching annotation system. The combination of the intelligent mobile device and the web client can realize the whole reading teaching process, and implement intelligent recommendation of readings materials by data collection and analysis of students reading. Practice shows that the system can meet students' personalized learning needs to a certain extent, and realize the paperless operation at the same time. Using this system to standardize the annotation format can facilitate teachers' teaching and verification, and also improve the efficiency and teaching quality.

9:00 - 17:00 TuesP1.9

Teaching Practice of Graduation Design Course in Digital Media Art Major, pp. 118-121.

Lu Geng — Shanghai Univ. of Eng. Sci.

In this paper, the graduation design course in the digital media art major of College of Sino-Korea Multimedia Design subordinate to Shanghai University of Engineering Science is taken as an example to expound four key factors of construction of the graduation design course, together with exploration in and reflection on the teaching and instruction modes of such course.

9:00 - 17:00 TuesP1.10

Recognition of Point Sets Objects in Indoor Scenes, pp. 122-127.

Ruizhen Gao — Hebei Univ. of Eng.
Xiaohui Li — Hebei Univ. of Eng.
Jingjun Zhang — Hebei Univ. of Eng.

With the wide application of 3D intelligent sensing technologies such as Lidar and Stereo Camera in robotics and driverless driving field, the acquisition of point cloud data is getting easier, and the cost is becoming lower. The research on point cloud data is gradually transiting from lower-level geometric feature extraction to higher-level semantic understanding. Due to the disorder of point cloud data format, most researchers will transform point cloud data to regular 3D voxel grids, collections of images, depth maps, etc. which will inevitably lead to huge data processing problems. In this paper, based on the indoor scene, we design a new neural network to process point cloud data, which solves the problem of disorder and rotation invariance of point cloud data. Theoretically, this network structure shows strong performance. In experiment, there is an accuracy rate of 89.7% on the test set, this method is superior to current mainstream methods. Experiments show that the improved network structure can accurately identify objects in indoor scenes and has strong robustness.

9:00 - 17:00 TuesP1.11

Research on the Application of Virtual Reality Technology in the Teaching Model, pp. 145-148.

Jie Jiang — Jiang Xi Sci. & Tech. Normal Univ.
Lei Zeng — Jiang Xi Sci. & Tech. Normal Univ.

This paper summarizes the advantages of virtual reality technology in the teaching of this course by analyzing the teaching characteristics, teaching means and methods, and teaching resources of this course. On this basis, the paper puts forward the gamification teaching, theory explanation and virtual training, virtual teaching and classroom communication teaching mode based on virtual reality technology.

9:00 - 17:00 TuesP1.12

Research and development of the regulation training system of minimally invasive knee surgery based on VR technology, pp. 161-164.

Ran Li — Dalian Ocean Univ.
Yan Lou — Chinese Medical Sciences Univ.

The regulation training system of minimally invasive knee surgery based on VR technology is a VR training platform specially designed for beginners to understand the knee joint cavity tissue structure and master the entire process of minimally invasive knee surgery. The main modules of the system include medical data visualization, knee joint cavity tissue structure dynamic model, the stress and deformation simulation of tissues and organs in knee joint cavity, minimally invasive surgery case simulation demonstration, force feedback and sensor applications, high speed graphics and image processing, etc. The system is the first invention and application in the field of minimally invasive knee surgery and in all the fields of minimally invasive surgical training. It fills a gap in the field of virtual reality application of medical technology and education in China. It provides a good training platform for beginners to master the skills of minimally invasive knee surgery, and also plays a valuable role in the technological innovation and improvement of medical education in China.

9:00 - 17:00 TuesP1.13

University Discipline Construction Progress Monitoring System, pp. 176-179.

Yifan Zhang — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.
Tianxiang Feng — Zhejiang Univ. of Sci. & Tech.

With the continuous development of information technology and the rapid growth of the population of higher education in developing countries, the education revolution of the new era is coming. It has become an important part in the national development strategy to build a number of first-class universities and first-class disciplines to improve the level of national science and education. However, in the early stage of education reform and the construction of discipline, there are some problems, such as tedious and complicated assessment work, inconvenient material arrangement and difficulty in information update and construction progress controlment. Through the "double top" discipline construction in colleges and universities of China plans to actively promote the status quo and the problems of exploration and research, the research group designed and proposed a university discipline construction progress system, through the system to form a set of strict logic and reasonable steps, and simplicity of operation index of collect information and statistics process. The system reduces the repetitive work and improves the efficiency of managers and the work of each department and it also provides a strong supporting for the university and subject.

9:00 - 17:00 TuesP1.14

Research on the Application of the Improved Assessment Model Based on the Separation of Teaching and Examination in C Programming, pp. 208-211.

Lijun Pei — Dalian Neusoft Univ. of Info.

Since the 1990s, Chinese universities have greatly expanded their enrollment, and major universities have made corresponding reforms in teaching and assessment. In 2019, the government called on Higher Vocational Colleges to enroll 1 million people, which indicates that vocational education will undergo changes, including enrollment system, teaching system and assessment methods, in order to ensure that higher vocational colleges have connotation and quality to expand their scale. Based on the analysis of the advantages and disadvantages of the traditional “integration of teaching and examination” and the "separation of teaching and examination" proposed in recent years, this paper puts forward an assessment method suitable for C programming in Higher Vocational colleges, which has been tested in our higher vocational colleges since September 2017. From the feedback and achievements of students in these two years, the effect is good.

9:00 - 17:00 TuesP1.15

Discovering Implicit Quantity Relations Using Convolutional Network, pp. 231-236.

Weina Cheng — Central China Normal Univ.
Xinguo Yu — Central China Normal Univ.
Jingjing Wang — Central China Normal Univ.

This paper presents a novel approach for automatically extracting implicit quantity relations (IQRs) from algebra word problems (AWPs). Our algorithm first classifies AWPs into categories and analyzes each sentence in the problem to identify the variables and values, then maps them to equations according to the category, and enables its trivial as shown in Figure 1. Our algorithm is able to discover 15 kinds of IQRs in AWPs with an average accuracy of 88% when the training sample accounts for more than 3% of the total. Our data and code are publicly available.

9:00 - 17:00 TuesP1.16

Construction of the Global Tourism Platform Based on the "Internet +" Background, pp. 262-265.

Zhaojie Ding — Zhejiang Univ. of Sci. & Tech.
Xuefen Lin — Zhejiang Univ. of Sci. & Tech.

Yuefeng Cen — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.

In view of the shortcomings of the current tourism platform, the research team integrates the available resources in the region and puts forward the design ideas of a new generation of global tourism platform relying on mobile Internet technology. The platform provides a solution for all-terminal coverage of PC and mobile terminals, aiming at planning the overall situation with mobile Internet thinking, optimizing tourism environment, enhancing tourism experience, and realizing the development goals of global tourism.

9:00 - 17:00 TuesP1.17

Autoencoder based API Recommendation System for Android Programming, pp. 273-277.

Jinyang Liu — Peking Univ.
Ye Qiu — Peking Univ.
Zhiyi Ma — Peking Univ.
Zhonghai Wu — Peking Univ.

As a typical example of modern Information Technologies, Android platform and Apps are widely used by smartphone users all over the world. Thus, the research of designing models for assisting programmers in writing Android codes is of great importance and value, and recommending API usages is a stereotype task in this aspect. This paper applies Autoencoder neural networks into the model of API recommendation system for Android programming, and designs new Autoencoder based Android API recommendation system. This paper carries out experiments on the collected Android code dataset and verifies the effectiveness of the newly designed models compared with classical recommendation models.

9:00 - 17:00 TuesP1.18

Retinal vessel segmentation based on Generative Adversarial network and Dilated convolution, pp. 282-287.

Jinlin Ma — North Minzu Univ.
Meng Wei — North Minzu Univ.
Ziping Ma — Northwest Univ.
Li Shi — North Minzu Univ.
Kai Zhu — North Minzu Univ.

Retinal vessel segmentation, which can obtain rich eye information, is an important indicator for examining ophthalmology and cardiovascular diseases. The existing method results in a decrease in resolution due to continuous maximum pooling and downsampling operations, causing the network to lose detail on the image when upsampling and restoring the feature map, ignoring small vessels or allow false positives at terminal branches. In order to better solve these problems, this paper proposes a method for combining dilated convolutions with U-Net networks to detect small vessels. In order to force the generated samples to fit the real sample distribution as much as possible, this paper uses the least squares loss function to replace the Sigmoid cross entropy, which alleviates the problem of gradient disappearance. The experimental results show that the proposed method improves the segmentation accuracy and reduces the loss to a greater extent on the DRIVE and STARE datasets.

9:00 - 17:00 TuesP1.19

Secure Beamforming for Simultaneous Wireless Information and Power Transfer in Wireless-Powered Full-Duplex Relay Networks, pp. 360-365.

Taoshen Li — Guangxi Univ.
Peipei Chen — Guangxi Univ.
Zhe Wang — Guangxi Univ.
Nan Xiao — Guangxi Univ.

In this paper, we study secure beamforming for simultaneous wireless information and power transfer (SWIPT) in wireless-powered full-duplex (FD) relay networks. The relay assists transmission of confidential information, while simultaneously harvesting the energy with power switching scheme by the radio-frequency (RF) signals. We propose a joint amplify-and-forward beamforming (AB) and energy signal (AB-ES) with the receiver power splitting strategy (PS) scheme to maximize the secrecy rate under harvesting energy constraints. Since these constraints make the optimization problems become non-convex and hard to tackle. We propose a two-level optimization approach via the one-Dimensional search and the semidefinite relaxation (SDR) technique with the aim of settling this issue. Simulation results show that the proposed scheme outperforms other schemes.

9:00 - 17:00 TuesP1.20

Research on Denoising of Finger Vein Image Based on Deep Convolutional Neural Network, pp. 374-378.

Chaoping Zhu — Chongqing Tech. & Business Univ.
Yongbin Yang — Chongqing Tech. & Business Univ.
Yun Jiang — Chongqing Tech. & Business Univ.

Because of finger vein collection device and using habit, the collected finger vein images contain noise, the extraction of finger vein features may cause errors. For the problem, a kind of finger vein image denoising method is proposed based on the deep convolution neural network, which is to collect the finger vein image as the input image of network, the non-linear mapping of the noise image to the denoising image is constructed through the hidden layer, a symmetric network structure is formed by the convolution subnet and the deconvolution subnet, convolution subnet learns finger vein image characteristics, the deconvolution subnet restores the original image according to the feature graph, and the modified linear unit is used to obtain more details of finger vein texture. The experiment was conducted as a training set in the finger vein database of the polytechnic university of Hong Kong, use Tensorflow model to train network model in GPU environment. The experimental results show that this method can remove the noise in the finger veins , the higher peak signal-to-noise ratio is obtained, which lays the foundation for the subsequent feature extraction.

9:00 - 17:00 TuesP1.21

Practice Teaching Reform of Discrete Mathematics Model based on D3.js, pp. 379-384.

Tianbo Lu — Beijing Univ. of Posts & Telecommunications
Peng Zhang — Beijing Univ. of Posts & Telecommunications
Huiyang Li — The Univ. of Texas at Arlington

From the counting principle of discrete mathematics, this paper puts forward a new teaching model, to guide students through the use of D3.js visual graphics library, to realize the dynamic displays of Fibonacci sequence, Yang hui triangle, Pigeonhole principle and principle of Permutation and Combination and realize the visualization platform of counting principle. This teaching model combines the theoretical learning of discrete

mathematics with the D3.js experiment. In addition, we have designed the teaching schedule and specific teaching implementation program, so that our teaching model is feasible. At the same time, we also put forward the corresponding teaching evaluation model to realize the evaluation of students' comprehensive performance. This model can not only stimulate students' interest in theoretical learning and improve their practical innovation ability, but also help to further improve the practical teaching system and improve the level and quality of practical teaching. Finally, we hope that the teaching and learning of the counting principle of discrete mathematics will become a good opportunity to experience the beauty of computer programming and mathematics, and thus, more people will have a strong interest in these two aspects, so that they can contribute their own strength to society.

9:00 - 17:00 TuesP1.22

A Simulated Annealing-based Heuristic for Logistics UAV Scheduling Problem, pp. 385-390.

Yixuan Li — Nanjing Univ. of Posts & Telecommunications
Jiazhen Zhang — Nanjing Univ. of Posts & Telecommunications
Ran Meng — Nanjing Univ. of Posts & Telecommunications
Jie Zhu — Nanjing Univ. of Posts & Telecommunications
Haiping Huang — Nanjing Univ. of Posts & Telecommunications

The UAV scheduling problem is investigated in the paper, in which the packages are assigned to the UAVs and delivered from one distribution station to their destination stations. The optimizing objective is to maximize the satisfaction degrees of the users which are highly related to the packages' deadlines. The problem is applicable in the logistics field. The challenges lie in making decisions on what packages an UAV will deliver in a flight and how many flights will an UAV perform. A flight of an UAV is taken as a flight mission, and the package set delivered in one mission is called a bundle. An iterated heuristic framework is presented to schedule the flight missions which mainly consists of three components: the initial solution generation component (ISG), the first simulated-annealing component (FSA) and the second simulated-annealing component (SSA). ISG generates a feasible solution by the knapsack-based algorithm. FSA and SSA are performed to improve the initial solution on the package level and the bundle level, respectively. By comparing with three related heuristics, we illustrate that the proposal is robust and effective for the problem under study.

9:00 - 17:00 TuesP1.23

Cloud-based Multi-core Architecture against DNS Attacks, pp. 391-393.

Jiemin Zhang — Jimei Univ.
Jian Mao — Jimei Univ.
Jinming Liu — Jimei Univ.
Zhi Tang — Jimei Univ.
Zhiling Gu — Jimei Univ.
Yongmei Li — Xiamen Inst. of Tech.

The domain name resolution system provides support service for website visits as the basic service of the Internet. With the increase of DNS attacks, it has brought copious challenges to network security. The paper studies on the key defense technologies against DNS attacks based on the DNS principle. The multi-core customized to the DNS is adopted to analyze hardware kernel, while AI algorithms being realized for malicious flow cleaning and intelligent routing running on the cloud system established specifically for DNS. The designed DNS intelligent cloud system can provide high-efficiency domain name resolution in practice, while ensuring the network security.

9:00 - 17:00 TuesP1.24

A Scheduling Algorithm for Urine Cell Dyeing Machine, pp. 401-405.

Lisheng Wang — Tongji Univ.
Zhiming Yu — Tongji Univ.
Dongdong Zhang — Tongji Univ.
Guofeng Qin — Tongji Univ.
Zhenlei Xu — Tongji Univ.

In the early diagnosis of diabetes mellitus, staining analysis of urine cells in urinary sediment is a very effective method. The traditional method of cell staining is artificial staining, which is inefficient, inefficient and inconsistent. However, the full-automatic cytostain apparatus which are homemade has many disadvantages. For example, the dyeing efficiency is low and the performance is unstable. In this paper, a new dyeing scheduling algorithm is proposed, which can solve the problems of cell dyeing machines. This algorithm called accuracy-first algorithm is a parallel dyeing algorithm, which takes time registration as the core and is implemented by backtracking method. It can guarantee dyeing accuracy and improve dyeing efficiency. Experiments show that the proposed accuracy-first dyeing scheduling algorithm has higher dyeing accuracy and higher dyeing efficiency.

TuesP2 UA1140
Education & New Tech-I

9:00 - 17:00 TuesP2.1

Research on Talent Cultivation Mode of Computer Between China and America, pp. 11-16.

Xiaoming Zhu — Beijing Normal Univ.
Lin Huang — Beijing Normal Univ.
Donghui Zhang — Beijing Info. Sci. & Tech. Univ.
Yungang Wei — Beijing Normal Univ.

In the context of rapid development of science and technology today, cultivation of innovative computer talent is particularly important in today's information age. The talent cultivation mode of computer between China and America were researched by the international education method of "going out and bringing in". In the three aspects of teaching materials, operating system and experimental teaching, this paper expounds the differences of the talent cultivation of computer between China and America, discusses and researches these differences.

9:00 - 17:00 TuesP2.2

Research on the Platform of Online Education Platform Based on Cloud Computing, pp. 22-25.

Boqin Liu — Southwest Univ.
Hanrong Chen — Southwest Univ.
Junmei He — Southwest Univ.

Different from the development of traditional web-based learning system, Based on Cloud Computing network learning platform focuses more on how to build the system based on cloud computing infrastructure, thus enabling the system to take full advantage of cloud computing technology to provide more comprehensive, practical and efficient services. The construction of our school education information infrastructure has begun to take shape, the level of construction steadily improved,Due to significant improvement in the quantity and quality of digital educational resources, a large number of excellent information-based talents have been cultivated to contribute to universal lifelong education and the construction of study-oriented society.

9:00 - 17:00 TuesP2.3

Enhancing Computer Students' Academic Performance through Predictive Modelling - A Proactive Approach, pp. 97-102.

Leah Mutanu United States International Univ.
Philip Machoka United States International Univ.

Through the application of ICT for predictive analytics, proactive strategies can be implemented to improve the quality of education for a country's development. The study demonstrates the process of predictive modelling of students' academic performance with a view of identifying strategies that can manage performance drivers. Machine learning algorithms such as Decision trees, Regression and Neural Networks were used in the research for prediction modelling. The results showed that students' performance can be modelled and predicted with reasonable accuracy that can inform strategies for improving performance. In order to improve the approach, the study recommends scaling the approach to make use of other algorithms, ICT tools, other degree programmes and incorporate other institutions.

9:00 - 17:00 TuesP2.4

Evaluating the Performance of Teaching Assistants in Computer Science B-learning Classes, pp. 128-132.

Mingxiao Lu Nankai Univ.
Hong Zhao Nankai Univ.
Kai Wang Nankai Univ.
Yun Guo Nankai Univ.
Yan Li Nankai Univ.

Researches have indicated that teaching assistants (TAs) have a positive impact on the experience of the students about courses, especially in practical classes. This paper describes a successful use of TAs in the blended learning (b-learning) courses of Computer Basis at a comprehensive university in China. The purpose of this study is to analyze the TAs' crucial behaviors influencing the evaluation of TAs' teaching performance from students. In total, 3009 valid data were collected from students using online survey, and a sequential mixed-method analysis was implemented. The empirical results indicate that TAs' tutoring for students in practice classes and after class has significantly positive influence on the overall evaluation from students. Furthermore, TAs need to improve themselves in leading group discussion and explaining assignments through the Learning Management System.

9:00 - 17:00 TuesP2.5

Course of Circuit and Electronic Technology for Computer Major, pp. 133-138.

Xiaofeng Zhang Nanchang Hangkong Univ.
Hongmei Mao Nanchang Hangkong Univ.

With the development of computer technology, more and more new knowledge needs to enter the classroom. It is necessary to adjust the training program of computer specialty and merge the two courses of circuit analysis and analog circuit into one course of circuit and electronic technology. The theoretical teaching syllabus, experimental teaching syllabus, selection of teaching materials and assessment methods are discussed. We hope to share our teaching experience for more colleagues.

9:00 - 17:00 TuesP2.6

Improving the Management level of Teaching Quality and Training the First-class Skilled Talents, pp. 149-154.

Chengjiang Lu Guangdong Polytechnic of Sci. & Tech.
Xiafeng Peng Guangdong Polytechnic of Sci. & Tech.

In higher vocational education, the core work and the fundamental task is talent training. The key point of high quality talents cultivation is first class teaching management. In second-level?school, the emphasis should be put on the management level of teaching quality to ensure the training quality of first-class skilled talents. In this paper, contents of teaching management including position and characteristics of school, development expectations, supporting measures of teaching quality, construction of the faculties, curriculum arrangement, construction of practice site and social evaluation of graduates are expounded which indicate the relationship between the level of teaching management and quality of skilled talents is close. Some problems of restricting school teaching level and the future improvement measures are presented as well.

9:00 - 17:00 TuesP2.7

The reform and practice of the training of computer innovative talents based on SPOC teaching model, pp. 165-167.

Ran Li Dalian Ocean Univ.
Yan Lou Chinese Medical Sciences Univ.

Aiming at the limitation of MOOC teaching mode, this paper put forward the teaching mode of SPOC to complement the MOOC, teaching focus on teacher-student interaction and difference teaching, blended learning through online and offline, the combination of science and technology competition, enhance the teaching effect and students' innovation ability, and from the teaching design and teaching levels and other aspects to elaborate the concrete measures.

9:00 - 17:00 TuesP2.8

The Feasibility Study of Augmented Reality Technology in Early Childhood Education, pp. 172-175.

Yang Kuang Jiang Xi Sci. & Tech. Normal Univ.
Xiaomei Bai Jiang Xi Sci. & Tech. Normal Univ.

With the rapid development of science and technology, the development and improvement of hardware and software make the cost of developers and users greatly reduced, educational knowledge and learning environment and communication methods have undergone great changes. Based on the characteristics of augmented reality technology and the characteristics of children's psychology, this paper puts forward the feasibility analysis of augmented reality technology in the field of early childhood education.

9:00 - 17:00 TuesP2.9

Innovative Talent Cultivation Pattern of Software Engineering under Internet Plus, pp. 180-183.

Huigui Rong — Hunan Univ.
Shiyong Li — Hunan Univ.
Sheng Xiao — Hunan Univ.
Naizheng Bian — Hunan Univ.
Hang Li — Hunan Univ.

Recently, the combination of between Internet and the traditional business shows a fast development trend, and this further accelerates the fusion of IT technology and business applications. Therefore, multiple new innovative applications emerge for better serving daily life of the public. Facing this new demand and trend, our talent cultivation pattern of traditional software engineering no longer meets the current innovative needs. Therefore, it is urgent to explore the new talent cultivation pattern from the traditional software engineering to the one of internet plus pattern. This paper focuses on the new characteristics of software engineering education under Internet plus environment, and designs innovative methods for improving the talent cultivation of software engineering under the perspective of Internet plus. Furthermore, we build a new talent cultivation framework and propose an innovative talent pattern by analyzing the shortage of existing talent cultivation pattern. We cultivate more innovative software talents by this pattern, and further promote the development of innovation and entrepreneurship.

9:00 - 17:00 TuesP2.10

Exploration and Construction of Effective Teaching Environment, pp. 184-187.

Wei Li — Xi'an Univ. of Tech.
Lei Wang — Xi'an Univ. of Tech., Shaanxi Univ. of Tech.
Xinhong Hei — Xi'an Univ. of Tech.
Xiaofan Wang — Xi'an Univ. of Tech.

In view of the shortcomings of traditional classroom teaching, an effective teaching environment with four dimensions which includes individualization, knowledge, skills and meta-learning, is constructed to cultivate students to possess wide and deep knowledge. The proposed teaching environment is applied to the Object-Oriented Programming Course. Continuous exploration and practice results show that the model has a good reference guide for training high-quality innovative talents.

9:00 - 17:00 TuesP2.11

How to Promote Teaching Quality and Efficiency in University——Quantification Technology, pp. 204-207.

Weihu Wang — Hubei Eng. Univ., Hankou Univ.
Zenggang Xiong — Hubei Eng. Univ., Central China Normal Univ.
Yanshen Liu — Central China Normal Univ.

This paper presents a new method for solving teaching problems under the background of different teachers teaching various special courses to promote teaching quality and efficient in university, which uses advanced Quantification Technology. It is important to help some teachers promote teaching quality and solve teaching problems. For validating the method, the paper chooses computer science and technology professional courses in a university as study object.Firstly, this paper deeply analyzed examination results in a term and got the relation among these professional courses by Quantification Technology. Secondly, according to this finding, it can get the prediction expression further. Finally, it is very effective to help teacher put forward a good teaching plan by some experiments in fact , after knowing student's state about learning previous course through prediction expression computed. This method can provide access to training, museums of science, and individuals as well.

9:00 - 17:00 TuesP2.12

A New Basic Teaching Mode for Artistic Disciplines under the Information Age, pp. 212-215.

Feng Yu — Shanghai Univ. of Eng. Sci.

What is basic? Requirements on basic artistic education vary from ages: in the agrarian age, the visual demand for capability of imitative reproduction needed stronger realistic creation ability to lay a better basis; in the industrial age, given the detailed division of sectors, a diversity of basic requirements was raised to facilitate commercial manufacturing; in the information age where we exist at present, unprecedented cross-border integration has been witnessed in various industries and cultures, leading to the deviation of basic requirements from those in previous ages. Therefore, we need a new basic training mode under the general background of new creative & entrepreneurial chain, and training shall be implemented from the core of "training on cognition, development of aesthetic analysis, and elaboration on logic of fine art". Popular expressions of "BIG DATA", "Big Data", "Digitalization" and "Mediatization" are exactly typical characteristics of the age which is now going through information explosion. Regardless of the correctness of such a craze, each of us has actually been involved in this torrent and is hardly possible to stay out of it. Meanwhile, big data and big information are intruding into and changing our lives unexpectedly at an amazing speed. CG (Computer Graphics) has been rapidly popularized and developed in the digital field, and can be considered as having changed all design-related visual languages and existing in every sector of work and life; thus, it has further brought about an adjustment of the entire human educational regime, including reflection and deliberation on basic training for cultivating artistic design talents. What is basic education supposed to be for cultivating design talents under the current situation at this information age? Is there any value of the existence of sketching, known as a core course in the basic education system for design majors and the first course for freshmen who major in design? If so, what are its cultivation mode and system supposed to be? How can we tell its essential difference from the original exam-oriented education? What are its key goals of training? Why does such training have coherency and systematicity with the subsequent curriculum arrangement in sophomore and junior years and in internship and graduation project? Is it substantially divorced from social sectors where graduates are employed? Given similar problems emerging in recent years, is there a need for the reform of sketching systems adopted in all-level educational institutions and universities? How does the reform work? What kinds of design talents are expected? What design qualities are required for designers dealing with information media? Considering aforesaid questions, the author has set the basic teaching mode of arts adopted in the first-line university education for 10 years as a basis, which is essentially different from the original sketching system (including design sketch tutorials and other attempts in recent years).

9:00 - 17:00 TuesP2.13

Thoughts on cultivating applied and innovative talents in computer majors of universities, pp. 216-221.

Xiaojin Zhang — Minjiang Univ.
Haibo Luo — Minjiang Univ.
Jinglan Wu — Minjiang Univ.

This paper briefly analyses the advantages and disadvantages of the traditional teaching mode in universities and compares it with the reform mode. Through the questionnaire survey of off-campus training, it understands the needs and opinions of students and makes a brief analysis. It also puts forward the reform measures of the training mode of computer science and technology professionals, focusing on reconstructing the curriculum system, strengthening practice and paying attention to innovation education. The training point of view illustrates the necessity of reform and verifies it. The preliminary results are illustrated by the employment rate of graduates, employment types and employer evaluation data.

9:00 - 17:00 TuesP2.14

Reverse thinking teaching discussion in high school information technology under new curriculum standards, pp. 222-226.

Jian Gao Tianjin Normal Univ.
Lan Wang Tianjin Normal Univ.

High school information technology courses have not drew much attention of most schools all the time. The time for classes is short and the enthusiasm of students is not high. With the continuous implementation of the curriculum reform of the ordinary high school in 2017, more and more schools begin to pay attention to the high school information technology curriculum, and begin to focus on cultivating teachers and students' information literacy and other abilities. In the new era, compare with traditional subjects, the teaching of high school information technology is more important and easier to cultivate students' literacy and thinking. This article is based on how people learn and think, Through the reverse thinking teaching method, taking the selective compulsory courses artificial intelligence preliminary module in the new curriculum standards as an example, in order to reform the traditional teaching mode, thus effectively improve the teaching level and lead students to pay attention to learning information technology.

9:00 - 17:00 TuesP2.15

Discussion on the reform of university public computer curriculum under the background of new curriculum standard, pp. 227-230.

Fan Xu Tianjin Normal Univ.
Lan Wang Tianjin Normal Univ.

With the gradual advancement of the new curriculum reform of the information technology in senior high school, university public computer curriculum faces problems such as curriculum content lags, separation of theory and practice, uneven student level, unreasonable evaluation system, single teaching model and platform. In response to these problems, this paper proposes some strategies for students to learn public computer courses on the basis of personalized learning based on the new curriculum standards of high school information technology, such as the Advanced Placement, the implementation of stratified teaching, the development of exemption systems, the implementation of the "online + offline" mixed teaching model, the improvement of the examination system, etc. It is expected to provide some feasible ideas for the better development of relevant teaching work.

9:00 - 17:00 TuesP2.16

An Experiment of Using Portable Lab in Improving Learning Effectiveness in an MCU Course, pp. 253-257.

Wen-Qian Zhang Xi'an Aeronautical Univ.
Jie Meng Shanxi Tech. & Business College
Han-Way Huang Minnesota State Univ. at Mankato

In the past, microcontroller (MCU) is taught as two separate courses: a lecture course and a lab course. Due to the lab course schedule, lab experiments often cannot synchronize with lectures. We proposed the portable lab teaching method to integrate the lectures and lab experiments in the same MCU course. Students listen to the lecture and perform the corresponding experiments in the class time. The lab experiments performed in the class time are for students to verify the concepts and algorithms taught in the lecture. In addition, students are also required to perform additional lab assignments on their own which require them to apply their innovative thinking. After two years of experiment, we evaluate the impact on student learning and performance of this approach. The result shows that student learning is improved significantly using this approach compared to the traditional approach.

9:00 - 17:00 TuesP2.17

Teaching reform on compiling principal course, pp. 258-261.

Na Wang Shanghai Polytechnic Univ.
Liping Li Shanghai Polytechnic Univ.

The compiling principal course is a key class in universities. To deepen knowledge in limited time, and develop the aggregation in relative course, we propose a new method for compiler theory course. Students can learn the basic knowledge from textbook in different prospects. The teacher will use cases in relative courses to explain knowledge points. Furthermore, they can refer to the videos on course website and MOOC websites. The students will obtain comprehensive theory knowledge and practice ability.

9:00 - 17:00 TuesP2.18

School-Enterprise Cooperation on Python Data Analysis Teaching, pp. 278-281.

Xinxin Liu South China Univ. of Tech.
Hongyun Xu South China Univ. of Tech.

To meet the needs of enterprises for data analysis talents, school-enterprise cooperative course Python Data Analysis introduces the basic theories and methods for data analysis by using Python programming language. The teaching content is organized around practical cases designed according to the actual demand of the enterprise. Exploratory teaching method is conducted to cultivate the communication, collaboration, critical thinking and creativity ability of students. Students fully participate in the teaching process by discussing, analyzing and programming the cases. The implementation scheme, organization of exploratory teaching and the design of teaching cases are introduced in this paper.

9:00 - 17:00 TuesP2.19

A Case Study of OBE-CDIO Implementation in Network Planning and Design Course, pp. 331-334.

Haiyi Jin Dalian Neusoft Univ. of Info.

In order to better cultivate high-quality applied talents, the network planning and design course is redesigned following the backward design principle, with Outcome-Based Education (OBE) and CDIO engineering education mode combined. In this paper, first of all, the course is clear the teaching objectives to support the graduation requirements, and then design the course evaluation method according to the teaching objectives.

Starting from the learning effect of students, re-design the corresponding learning and teaching methods to enable students to achieve the knowledge, ability and attitude required by the profession. Finally, taking a chapter of instructional design as an example, sharing how to focus on students, select teaching strategies, integrate teaching resources, and provide timely and effective support and help for students.

9:00 - 17:00 TuesP2.20

Research on the Processing of Micro-Course Production in ART Higher Education, pp. 366-369.

Lin Zhi — Jiang Xi Sci. & Tech. Normal Univ.
Zhen Xiong — Jiang Xi Sci. & Tech. Normal Univ.

With the rapid development of society today, along with the continuous development and innovation of China's information technology, mobile terminal equipment is well known and used by people. The emergence of micro-video makes people more aware of mobile learning, and lifelong learning has become an inevitable social trend. DV film and television production is a important course in art higher education. This paper takes this course as an example to discuss and summarize the way and method of micro course production, hoping to improve the quality of micro course video shooting, meet the needs of researchers and learners, and promote the reform of art higher education and teaching.

9:00 - 17:00 TuesP2.21

Research on Optimizing Online Course Construction Mode, pp. 370-373.

Zhen Xiong — Jiang Xi Sci. & Tech. Normal Univ.
Lin Zhi — Jiang Xi Sci. & Tech. Normal Univ.

With the rapid development of online education, its core resource is online courses. Online courses not only have achieved considerable growth in the number of users, but also have the advantages that traditional courses cannot match. This paper introduces the existing online course construction mode, and analyzes the advantages and disadvantages of the existing online course mode. This paper puts forward the mode optimization construction of online course from three aspects of course design elements analysis, course design principles and course optimization methods.

9:00 - 17:00 TuesP2.22

Teaching Strategy of Programming Course Guided by Neuroeducation, pp. 406-409.

Jianwei Zhang — South China Univ. of Tech.

For a long time, pedagogy has been a social practice based on direct experiences, and many traditional teaching methods have formed. These methods were not supported by a scientific theoretical system and could not meet the fast-changing social needs. Neuroeducation is an empirical science, and an interdisciplinary subject that applies the latest theoretical advances in human brain and psychology to pedagogy. This paper explores the connection between neuroeducation and the teaching practice through the study of the latest theoretical achievements in neuroscience, cognitive neurology and psychology. Guided by theory of neuroeducation, the course content, the teaching strategy and new learning methods are proposed to improve the teaching quality of computer programming courses, while improving students' computational thinking ability.

9:00 - 17:00 TuesP2.23

Towards Quality Assurance for Curriculum of Vocational Education based on Effective Learning, pp. 410-414.

Xiaohui Xu — Chongqing College of Electronic Eng.
Xinyi Guo — Chongqing College of Electronic Eng.

At present, the information technology and modern vocational education are being deeply integrated. The newly designed curriculum system of vocational education has brought some new learning experiences to students, but it also puts forward higher and higher requirements for the quality assurance of curriculum. After analyzing the problems of quality assurance in modern vocational curriculum, this paper introduces the viewpoint of effective learning to study the design and construction of quality assurance mechanism in modern vocational curriculum. A "trinity" internal linkage mechanism of curriculum construction, quality assurance and curriculum operation is put forward in order to realize the spiral improvement and sustainable development of curriculum quality in modern vocational education.

9:00 - 17:00 TuesP2.24

The Application Of Critical Thinking In C Programming Language Course, pp. 420-422.

Qingfeng Huang — Huazhong Univ. of Sci. & Tech.
Xiaotao Huang — Huazhong Univ. of Sci. & Tech.
Cai Fu — Huazhong Univ. of Sci. & Tech.

C programming language is an important course for undergraduates. Algorithmic design thought is the essence of programming course.But it is very difficult for undergraduates to master it.Most students master grammer of C programming language only.About algorithm,They are still in the imitation stage.Application of Critical thinking on teaching could improve teaching effect greatly,which would promote students to form their own ideas for algorithm design. To extend this mode to more departments or more computer basic courses is our future work.

9:00 - 17:00 TuesP2.25

Developing a computerized dynamic assessment system for Chinese EFL learners, pp. 444-447.

Simin Zeng — Harbin Inst. of Tech., Shenzhen
Mingfei Xu — Minzu Univ. of China
Xi Chen — Harbin Inst. of Tech., Shenzhen

Dynamic assessment differs from traditional static assessment as it not only measures fully developed abilities , but also growing abilities that are not yet matured. This provides important insights into learners' learning potential and is helpful for the planning of future instruction. Computerized dynamic assessment is a new context for dynamic assessment in which the computer automatically produces prompts to mediate and assist learner behaviour. This paper argues that a computerized dynamic assessment system of English listening and speaking holds value for both second language education practitioners and education technology specialists.

9:00 - 17:00 TuesP2.26

Application of Concept Map in the Study of Computational Thinking Training, pp. 454-459.

Ling Xu — Central China normal Univ.
Mingwen Tong — Central China normal Univ.

Bin Li — Central China normal Univ.
Jiang Meng — Central China normal Univ.
Chenyao Fan — Central China normal Univ.

The call for innovative talents in the information age is imminent. With the promulgation of the domestic high school information technology curriculum standards in 2017, the formulation and positioning requirements of the core literacy of the disciplines, computational thinking as one of the four core literacy, is the thinking ability that everyone should have. Many foreign educational practice studies have shown that mind mapping can effectively promote students' cognitive development and knowledge construction. However, the domestic educational application research is relatively lacking in this aspect, and there is little research on the comprehensive and in-depth combination of it and the core literacy "computational thinking" of the specific information technology discipline. To this end, based on the research status at home and abroad, this paper attempts to use the concept map tool to represent several important functions of computational thinking, "definition of problems", "abstract function", "build model" and "Debugging and improvement". The diagram incorporates the teaching model in the computational thinking development curriculum. This study used quasi-experimental research methods to explore the effect of conceptual map tools on students' computational thinking. The research results show that this teaching method has a significant effect on the development of students' computational thinking.

TuesP3 — UA1220
Data Science & AI-I

9:00 - 17:00 — TuesP3.1

Research on Multi-layer Adaptive Intrusion Detection Based on Clustering and Neural Network, pp. 1-4.

Yingyue Chen — Xiamen Univ. of Tech.

Aiming at the shortcomings of current intrusion detection, a SOM neural network method based on clustering and network level is proposed in this paper. Through the identification of easy-to-use network intrusion type, the network intrusion data is cleaned and analyzed in a targeted manner and the multi-layer adaptive network intrusion detection clustering model is established. Network intrusion detection clustering result based on this model is compared with result based on other methods. The results show that this model has higher accuracy and equilibrium and the validity and feasibility of the method is further verified.

9:00 - 17:00 — TuesP3.2

Locality-Sensitive Hashing Scheme Based on Heap Sort of Hash Bucket, pp. 5-10.

Bo Fang — Harbin Inst. of Tech., Shenzhen
Zhongyun Hua — Harbin Inst. of Tech., Shenzhen
Hejiao Huang — Harbin Inst. of Tech., Shenzhen

Nearest neighbor search (NNS) is one of the current popular research directions, which widely used in machine learning, pattern recognition, image detection and so on. In the low dimension data, based on tree search method can get good results. But when the data dimension goes up, that will produce a curse of dimensional. The proposed Locality-Sensitive Hashing algorithm (LSH) greatly improves the efficiency of nearest neighbor query for high dimensional data. But the algorithm relies on the building a large number of hash table, which makes the space complexity very high. C2LSH based on dynamic collision improves the disadvantage of LSH, but its disadvantage is that it needs to detect the collision times of a large number of data points which Increased query time. Therefore, Based on LSH algorithm, later researchers put forward many improved algorithms, but still not ideal. In this paper, we put forward Locality-Sensitive Hashing Scheme Based on Heap Sort of Hash Bucket (HSLSH) algorithm aiming at the shortcomings of LSH and C2LSH. Its main idea is to take advantage of the efficiency of heapsort in massive data sorting to improve the efficiency of nearest neighbor query. It only needs to rely on a small number of hash functions can not only overcome the shortcoming of LSH need to build a large number of hash table, and avoids defects of C2LSH. Experiments show that our algorithm is more than 20% better than C2LSH in query accuracy and 40% percent lower in query time.

9:00 - 17:00 — TuesP3.3

Elliptic Feature Recognition and Positioning Method for Disc Parts, pp. 26-31.

Jinlin Ma — North Minzu Univ.
Kai Zhu — North Minzu Univ.
Ziping Ma — North Minzu Univ.
Meng Wei — North Minzu Univ.
Li Shi — North Minzu Univ.

Machine vision technology is more and more widely used in industrial production. Parts' sorting is a very common application scenario in industrial production. Considering the particularity of circular Parts, a method of part identification and positioning based on ellipticity is proposed. The method firstly preprocesses the image, then performs threshold segmentation to extract the edge contour, and then further filters the extracted edge contour, and performs least squares circle fitting on the basis of the retained edge contour to solve the Parts' pose. Finally, similarity matching is performed to determine the type of Parts' information. The experimental results show that the proposed algorithm can effectively identify and locate the parts.

9:00 - 17:00 — TuesP3.4

Dynamic Facial Expression Recognition Based on Deep Learning, pp. 32-37.

Liwei Deng — Chongqing Univ.
Qian Wang — Chongqing Univ.
Ding Yuan — Chongqing Univ.

With the development of deep learning, CNN model has performed much better than traditional machine learning algorithm in many computer visual recognition tasks. In the field of Facial Expression Recognition (FER), although there are many recognition systems using DNNs, their accuracy and practicality are still not suitable for practical applications. In order to solve the problem of the feature extraction and feature fusion of time domain and spatial domain in dynamic facial expression recognition, this paper proposed a 3D Convolutional Neural Network method for FER in videos. This neural network consists of a Stem layer, a 3D Inception-ResNets structure, a GRU layer, a Dropout layer, an Island layer and a Softmax layer, which can capture spatial relationships in facial expression images and temporal relationships among different face frames. In order to increase the contribution degree of the important face component in the expression recognition, in addition to inputting the facial expression frame data, important feature point information of the facial expression was extracted and input into the network structure. In addition, a new Island loss function with strong ability to distinguish different features is introduced. It can not only reduce the intra-class variations, but also

enlarge the inter-class differences, which could better ignore the effects of facial expression variability and sensitivity, and achieve higher recognition accuracy and generalization ability. The proposed method was evaluated for using four public available databases in subject-independent and cross-database tasks and outperformed the state-of-the-art methods.

9:00 - 17:00 TuesP3.5

Research on Individualized Teaching Based on Big Data Mining, pp. 56-59.

Jie Jiang — Jiang Xi Sci. & Tech. Normal Univ.
Lei Zeng — Jiang Xi Sci. & Tech. Normal Univ.

Big data is a valuable resource of Internet education platform and an important technology to provide individualized service for learners. This paper discusses the application of four kinds of big data mining techniques, clustering, classification, association analysis and specific group, in individualized teaching, and puts forward a set of individualized education method system based on big data and data mining methods. It also analyzes the four levels of the overall framework and the specific methods of individualized education based on big data.

9:00 - 17:00 TuesP3.6

Research on Evaluation Strategy of Development Degree of Military Academies, pp. 65-70.

Yun Bai — National Univ. of Defense Tech.
Cui Li — National Univ. of Defense Tech.
Peiqi Wang — National Univ. of Defense Tech.

The evaluation of the development degree of military academies is the core content of the evaluation of military development institutions, and it has a great role in promoting the science, innovation and sustainable development of military academies. Judging the degree of achievement of the quality objectives of military academies, the calculation of the incremental value of military colleges and universities, the calculation of the input and output efficiency of military academies, the benchmarking of the development degree of military academies, and the development degree of military academies The evaluation strategy is carried out to provide some inspiration for the evaluation of colleges and universities.

9:00 - 17:00 TuesP3.7

Robust Adaptive Iterative Learning Control for Nonlinear Systems with Non-Repetitive Variables, pp. 71-76.

Wei Zhou — Jiangsu Vocational Inst. of Commerce
Baobin Liu — Jiangsu Vocational Inst. of Commerce

In this work, the temporally and iteratively varying problems in iterative learning control for a class of nonlinear multiple input multiple output systems is discussed. Time-iteration-varying variables are generated by high-order internal models. Reference trajectories and system initial states are bounded and vary randomly in iteration domain. Then an operator is applied to update the estimation matrix for the whole uncertainties including non-repetitive parameters and time-varying disturbances. With the proposed adaptive iterative learning control technique, estimation error is bounded and tracking error converges to zero asymptotically. The effectiveness of the proposed control is verified through simulation study.

9:00 - 17:00 TuesP3.8

Design of Intelligent Personal Schedule Management System, pp. 168-171.

Jiakai Xu — Zhejiang Univ. of Sci. &Tech.
Wen Zhou — Zhejiang Univ. of Sci. & Tech.
Gang Cen — Zhejiang Univ. of Sci. & Tech.

Based on the current status of the schedule management software, this paper analyzes the basic functions of the schedule management software, and proposes the design and improvement of the intelligent management personal schedule system for its single and inefficient schedule management method. At present, the schedule management method of the schedule management software, through the intelligent statistics and analysis of the user schedule, pushes scientific and reasonable scheduling schemes and suggestions to the user, and achieves the purpose of helping the user to effectively improve the life and work efficiency.

9:00 - 17:00 TuesP3.9

Promoting Deep Learning by Peer Learning, Exploring Blended Teaching Ideas, pp. 243-247.

Yandong Wen — Dalian Neusoft Univ. of Info.
Lijun Pei — Dalian Neusoft Univ. of Info.

In order to promote deep learning, this thesis adopts the blended teaching of peer learning mode to reverse the original teaching structure, that is, shallow knowledge learning takes place before class, and knowledge internalization is problem-driven peer learning. In the process, in order to improve students' high-level thinking ability, a new blended teaching design idea was explored, and a problem-driven peer learning process was designed to improve students' high-level thinking ability.

9:00 - 17:00 TuesP3.10

An improved RFID anti-collision algorithm and its application in food tracking, pp. 248-252.

Jinsheng Lu — Xiamen Univ.
Lvqing Yang — Xiamen Univ.
Yishu Qiu — Xiamen Univ.
Dingzhao Li — Xiamen Univ.

Food safety issues are frequent in today's society, and how to accurately and accurately track food is an urgent problem to be solved. In the information age of the Internet of Things (IOT), the "connected objects" feature allows food to provide detailed information from the production to the sales process, tracking the processing flow of each link, and when the food quality and safety issues arise, it can be accurate. Quickly find the source of food and related product flows, effectively prevent problem foods from entering the market, and let consumers eat safe food. This thesis mainly studies the multi-tag recognition collision avoidance in the Internet of Things technology, and improves the multi-fork tree anti-collision algorithm. By introducing the slot idea in the ALOHA algorithm, a dual-slot dynamic search algorithm (GMT) is proposed. Simulation experiments show that the algorithm effectively reduces the time spent on RFID tags recognition, reduces the number of collisions of tags, and reduces the energy consumption of the system. It is an effective anti-collision algorithm.

9:00 - 17:00 TuesP3.11

Predicting PPI Based on Quantum-inspired Neural Networks, pp. 266-272.

Li-Ping Yang — Huazhong Agricultural Univ.
Cheng Zhang — Huazhong Agricultural Univ.
Li Qin — Huazhong Agricultural Univ.

Studying how and when PPI (Protein-Protein Interaction) happens in cells is very important for catching molecules mechanism during life. Unfortunately, present classical computers technology and process speed for massive PPI data is far from meeting demand. It is a general trend of researching that utilizing quantum computation methods, bioinformatics knowledge and machine learning ability to effectively investigate existing massive data for discovering and verifying new PPI. In this paper, we utilize the quantum ant colony optimization algorithm (QAC) to optimize the quantum-inspired neural network QNN's parameters and propose a novel quantum neurocomputing scheme QAC-QNN which can prevent the solution sinking into local optimization. The simulation experiments prove that the novel scheme is feasible. For predicting PPI of proteins couple, in contrast with SVM and ANN, QAC-QNN achieves better prediction effects.

9:00 - 17:00 TuesP3.12

Vibration Fault Diagnosis Method for Planetary Gearbox of Wind Generating Set Based on EEMD, pp. 288-293.

Xianjiang Shi — Harbin Univ. of Sci. & Tech.
Hongjian Li — Harbin Univ. of Sci. & Tech.
Xiangdong Zhu — Harbin Univ. of Sci. & Tech.
Yi Cao — Harbin Univ. of Sci. & Tech.

Detailed instructions can be found at In order to deal with the pre-processing analysis of non-stationary vibration signals of wind turbine gearbox under complex conditions, this paper takes the first-order planetary gearbox as the research object and uses the Ensemble Empirical Mode Decomposition (EEMD) to extract the feature of the faults in the gearbox, then build a wind generating set simulation test bench to collect the vibration information of the gearbox under the normal and fault conditions of the planetary gearbox and decompose the vibration signal by EEMD, Envelope spectrum analysis is performed on the effective IMF component, and the characteristic frequency in the signal is extracted by envelope analysis and the planetary gear box working state is diagnosed. Comparative analysis of vibration data in normal and faulty state of planetary gearboxes. It shows that EEMD decomposition has a very obvious effect on the diagnosing of vibration signals and the suppression of modal aliasing. It can accurately reflect the fault characteristic frequency and verify the feasibility of the EEMD algorithm for planetary gearbox fault diagnosis.

9:00 - 17:00 TuesP3.13

Research on stator current analysis method of induction motor based on local fault diagnosis of gears, pp. 294-299.

Xianjiang Shi — Harbin Univ. of Sci. & Tech.
Sujian Li — Harbin Univ. of Sci. & Tech.

In this paper, the drive gear set driven by motor is taken as the research object. The generation mechanism of the modulated signal in the event of gear failure is studied. The principle of gear fault stator current detection and the stator current characteristics of the gear in normal and fault conditions are theoretically studied. Secondly, the gear fault simulation test bench is built. Under the conditions of the normal and simulated gear local faults, the motor stator current signal and the vibration signal of the gear system are collected, the wavelet transform and Hilbert transform analysis method are used to process and compare the collected signals. The research results show that the local fault of the gear will cause the change of the motor current. Combining the advantages of wavelet transform and Hilbert transform in signal processing, the fault characteristic frequency and related frequency of the gear are extracted successfully in the stator current. The comparison between stator current signal and vibration signal also proves the feasibility and superiority of stator current method in gear fault diagnosis. It shows that the continuous improvement and improvement of the stator current analysis method will provide strong technical support for the development of mechanical fault monitoring and diagnosis.

9:00 - 17:00 TuesP3.14

A Hierarchical Brain Network Model Based on the K-Shell Decomposition Algorithm, pp. 314-319.

Shuyan Peng — Jiangsu Vocational Inst. of Commerce
Wei Zhou — Jiangsu Vocational Inst. of Commerce
Yujun Han — Jiangsu Vocational Inst. of Commerce

The human brain is a complicated network which has some conflicted properties simultaneously such as robustness and vulnerability. Early researchers try to explore the phenomenon mainly focused their attention on the graphical properties of the node itself, such as degree and betweenness etc., but ignored the affection of the neighbors. This research suggested a perspective from the topological structure of the complex network to explore the paradoxical phenomenon. We introduced the K-shell decomposition algorithm to explore the structure of the brain network and the characteristics of nodes in it. Such method considers both the properties of the node itself and the affection of neighbors might inflict. Based on the algorithm, we generated a hierarchical brain network model. According to this model, the brain network has three components: the nucleus with the densest connection within it, the giant component, the nodes in it connect with each other but do not reach to the nucleus; the isolated nodes which solely connect to other parts of the network through the nucleus. Such 'medusa-like' shape was similar to the internet which promises that only when the nucleus had been destroyed, the robustness of the network would be damaged. Based on such structure, we hypothesize that the brain regions which belong to the nucleus could be considered as biomarkers of early detection for some neurodegenerative diseases, for these diseases only destroyed few brain regions that could cause the brain dysfunction to the patients, at the same time, such organization also suggests there are two different information delivery paths for the different cognitive tasks.

9:00 - 17:00 TuesP3.15

CSIID: WiFi-based Human Identification via Deep Learning, pp. 326-330.

Ding Wang — Zhengzhou Univ.
Zhiyi Zhou — Zhengzhou Univ.
Xingda Yu — Zhengzhou Univ.
Yangjie Cao — Zhengzhou Univ.

With the widespread popularization of commercial off-the-shelf (COTS) WiFi devices, the device-free WiFi sensing has attracted attention extensively. However, there are only a few studies on human identification by using noncontact techniques since traditional methods are facing the problem of heavy workload and low recognition accuracy. Aiming at these issues, we propose a deep learning method, named CSIID, to analyze the gait features using Channel State Information (CSI) of COTS WiFi devices In CSIID, the convolution layers are combined with long short-term memory (LSTM) layers to extract gait features automatically from CSI data and to identify persons, which effectively reduces the need for a large

amount of data preprocessing by manual feature extraction. Experimental results conducted on CSI data collected from different situations indicate that the CSIID has desirable identification accuracy. The average identification accuracy of CSIID is ranging from 97.4% to 94.8% when the number of persons is from 2 to 6.

9:00 - 17:00 TuesP3.16

Research on Cross-media Semantic Retrieval Methods of Information Resources Based on Deep Learning, pp. 340-344.

Yu Zhu Changchun Univ. of Tech.

This paper is to study cross-media semantic retrieval method of information resources based on deep learning. By analyzing the concept of deep learning, the depth structure and the prerequisites for deep learning, this paper studies the relationship between deep learning and information resources cross-media semantic retrieval, and points out the cross-media correlation learning technology of information resources on the basis of depth structure, buildings a distinct framework for information retrieval. As a new information retrieval model, the combination of deep learning and cross-media semantic retrieval can solve the problems of retrieving semantic information across the media and processing complex dimensional data, greatly improving the efficiency of data retrieval and integration. This model will replace the existing information retrieval tools, to become a sword to enhance the level of knowledge service in the era of big data.

9:00 - 17:00 TuesP3.17

Research and Development of Augmented Reality Children's Puzzle Game Based on Vuforia, pp. 354-359.

Guoli Wu Xiamen Univ.
Ming Qiu Xiamen Univ.
Yankun Zhang Xiamen Univ.
Yuhui Zheng Xiamen Univ.

The emergence of mobile augmented reality children's puzzle games conforms to the development of the information age. One augmented reality game named "Baby Running" was researched and developed, based on Unity engine and the Vuforia, which improves the interaction between the game and the player, and exercises the child's concentration and reaction. The paper will discuss the game planning, game system design, key technologies, game testing, and the system's conclusion and some future directions.

9:00 - 17:00 TuesP3.18

A Heuristic Hybrid Recommended Order Modle, pp. 460-465.

Yi Yang Chongqing Tech. & Business Univ.
Baolin Li Chongqing Tech. & Business Univ.
Jian Hu Chongqing Tech. & Business Univ.

As the informationized trend is developing toward intelligentized one in catering industry, the targeted ordering recommendation provide for customer based on the technique of intelligent recommendation has turned into reality. Applying in the scenario of traditional Chinese food service, a heuristic and hybrid model in ordering recommendation is proposed. First, the association rules algorithm was adopted for obtaining the association rules of historically associated dishes combination and calculating their correlation degree. Second, applying the recommended algorithm based on dishes attributes to calculate the similarities of dishes in the database. Third, to calculate comprehensive scores of dishes and create the recommendation rules in accordance with their correlation degree and similarities. Finally, a recommended order list is shaped from both the dishes ordered and the recommendation rules concluded in the former step. The effectiveness and validation of the model and algorithm are being proved by real order data in Chinese restaurants. The data shows the model is better than traditional association rules in the aspects of recommendation precision and coverage when the dishes ordered reaching to certain amount.

9:00 - 17:00 TuesP3.19

Research on the Application of Medical Big Data, pp. 478-482.

Min Li Hubei Univ. of Tech.
Chunzhi Wang Hubei Univ. of Tech.
Lingyu Yan Hubei Univ. of Tech.

Big data technology is increasingly used in the field of medical. Through medical big data technology, the growing medical data can be effectively processed, and the utilization of medical data can be improved. In this study, an architecture of medical big data application is proposed based on the analysis of the main sources and basic characteristics of medical big data. This architecture elaborates and discusses the collection, storage, analysis, exchange and sharing of medical big data, proposes data standards, data governance, data operational maintenance management, and information security systems. The specific application of medical big data is discussed as well. Finally, the challenges of current medical big data application are analyzed from the aspects of open sharing platform, application requirements, data utilization, data security and privacy, and the construction of compound professional talents.

9:00 - 17:00 TuesP3.20

Research and Application on the High-efficiency Teaching Model Based on Smart Classroom, pp. 483-487.

Hua Yan Southwest Univ.
Bin Yang Southwest Univ.

Advanced information technology and educational technology are used in Smart Classroom. More and more educators are paying attention to and studying how to combine the two reasonably and exert the best effect. At present, the widely accepted teaching model based on Smart Classroom is "Pre-class + In-class + After-class". The results of practice show that not all the knowledge is suitable for this model and its teaching efficiency can be further improved. In order to make Smart Classroom more efficient, this paper proposes a teaching framework based on Smart Classroom, and designs different teaching models for different types of knowledge under this framework. The results of practice show that the teaching efficiency of the proposed framework is more remarkable.

WedP1 UA1120
Computer Science-II

9:00 - 17:00 WedP1.1

A Low-cost Mobile VR Walkthrough System for Displaying Multimedia Works Based on Unity3D, pp. 415-419.

Zun Shen Xiamen Univ.

Juan Liu — Shandong Univ.
Yuhui Zheng — Xiamen Univ.
Lu Cao — Xiamen Univ.

Virtual reality technology has developed rapidly in recent years, and VR walkthrough system is used widely, as an important branch. This project is the application of VR walkthrough. We designed the new digital exhibition hall by modeling the three-dimensional space with a sense of reality and immersion. It focuses on multimedia works show and art education of universities, at the same time, it is an excellent way to demonstrate teaching achievements. The system runs on Android mobile phone and users can wear VR display equipment Cardboard to look around in the exhibition hall. In addition, users can move freely through the gamepad to view works in different areas. Meanwhile, they can choose works to play, which improves the interactivity between the system and users.

9:00 - 17:00 WedP1.2

A Multi-Dimensional Features-based Clustering Algorithm for Massive MIMO System, pp. 423-427.

Lianfen Huang — Xiamen Univ.
Hongyue Lin — Xiamen Univ.
Huanhuan Zhang — Xiamen Univ.
Yifeng Zhao — Xiamen Univ.

Massive MIMO system with FDD mode can support very high spatial reuse, however, the improvement of system performance is greatly limited due to the similarity between users and the overhead of uplink CSI feedback. In this paper, a clustering algorithm based on users multi-dimensional features for Massive MIMO System is proposed to mitigate inter-user interference. Specifically, it includes searching and eliminating users with noise spots, analyzing and defining user space-related and non-space-related features, and reducing the dimension of three-dimensional features. Then, inspired by the Affinity propagation (AP) clustering algorithm, we propose the scheme considering the similarity between users for clustering. The simulation results show that the proposed scheme can significantly reduce the inter-user interference while improving the average SINR of users.

9:00 - 17:00 WedP1.3

Top-k Skyline Result Optimization Algorithm in MapReduce, pp. 466-471.

Aili Liu — Dalian Neusoft Univ. of Info.

Skyline is widely used in multi-objective decision-making, data visualization and other fields. With the rapid increasing of data volume, skyline of big data has also attracted more and more attention. However, skyline of big data has its own shortcomings. When the dimension increases, skyline results will be numerous, and we would like to select k points from the result sets. In this paper, we propose the top-k skyline of big data. It is a Top-k Skyline Method in MapReduce, called MR-DMKS. Firstly, we convert the multidimensional data to a single value to determine the dominance relationship of two data points. Secondly, we calculate the score by using the converted values. Thirdly, sort the data points more efficiently and accurately according to the scores using a window queue. Finally, we choose k data objects having the strongest dominating capacity. A large number of experiments show that our method is effective, and has good flexibility and scalability on real data sets as well as synthetic data sets.

9:00 - 17:00 WedP1.4

Multi-Cycle CPU Design With FPGA in Experimental Teaching of Computer Organization, pp. 472-477.

Xing Liu — Wuhan Univ. of Tech.
Linghao Fu — Wuhan Univ. of Tech.
Wenbi Rao — Wuhan Univ. of Tech.
Christophe De Vaulx — Clermont Auvergne Univ.
Xiongmin Lin — Univ. of Victoria
Mingxi Liao — Wuhan Univ. of Tech.

CPU design with programmable FPGA has become a significant solution for the experiment teaching of computer organization principle. In this paper, the design concept, implementation technique and verification method of a multicycle MIPS CPU are presented. To decrease the CPU design complexity, the hierarchical division approach which divides the CPU into a serial of easy-to-implement modules is proposed. To help the students master the intricate FPGA development process in an easy-to-understand way, the easy-to-hard progressive implementation technique is investigated. To verify the functionality of each CPU module, the variable-control approach which verifies the CPU modules progressively by comparing with the standard ones is explored. The experiment cases have been carried out for six years, and the course survey results showed that the new experiment design with the new implementation approaches had improved the teaching quality of the computer organization experiment significantly.

9:00 - 17:00 WedP1.5

Research on DFF-TopK algorithm based on dynamic feature selection, pp. 493-501.

Xingyi Zhou — Hohai Univ.
Guoyan Xu — Hohai Univ.
Fan Liu — Hohai Univ.
Xinyue Su — Hohai Univ.

The time series of water level are affected by rainfall, temperature, upstream and downstream nodes and other factors, which have time fluctuation and spatial complexity, and the interaction between nodes will lead to the uncertainty of the prediction effect. Existing time series prediction algorithms require complex data preprocessing and dynamic feature attribute changes are not supported in these .Based on the above problems, a Dynamic feature-filtering algorithm DFF -TopK (Dynamic Feature filter-TopK) was proposed to reduce the degree of fusion of prior knowledge and support the change of dynamic feature attributes. The algorithm firstly established the initial random forest classifier by directly using the data of all existing features, sorted according to the importance of features and mapped from softmax to (0-1). Subsequently, the mapped features are set up as priority queues, and K features with higher priority are selected as input items. When the priority queue length is determined, the importance of input data features within a certain period will be dynamically adjusted along with the priority queue. Furthermore, the influence degree of the upstream and downstream nodes' opening and closing or the dry season and rainy season will be dynamically recognized with the algorithm, which reduces the time complexity and solves the uncertainty caused by a large number of characteristic stacking, and avoids the influence of the traditional prior knowledge division on the results. Compared with the existing global static RF and gradient lifting algorithm DS-TopK, the experiments show that the algorithm has a greater improvement in time complexity and prediction accuracy, which verifies the effectiveness of the algorithm.

9:00 - 17:00 WedP1.6

Adaptive Small Cells Clustering based on Multi to Multi Swap Matching for Ultra Dense Network, pp. 512-517.

Ning Chen — Xiamen Univ.
Siqiang Ke — Xiamen Univ.
Zhibin Gao — Xiamen Univ.
Hongyue Lin — Xiamen Univ.
Minghui Liwang — Xiamen Univ.
Lianfen Huang — Xiamen Univ.

Ultra-dense networks (UDN) play an important role in 5G, which significantly supports the network foundation for ultra-high density device connection and ultra-high speed data demand in future mobile network. However, the increasing density of small cell in UDN brings greater challenge to resource allocation in wireless networks. In order to achieve efficient resource allocation, a many-to-many swap matching (M-MSM) based algorithm of adaptive small cells clustering in ultradense networks is proposed in the paper. The many-to-many matching algorithm is utilized to divide the user-centric small cells into different clusters. Meanwhile the matching effect is further optimized by the swap matching algorithm. Simulation results show that the proposed M-MSM algorithm can effectively improve the maximum achievable rate of the UDN.

9:00 - 17:00 WedP1.7

Multi-step temperature prediction model based on surrounding cities and long-term memory neural networks, pp. 518-522.

Zhenyue Huang — Henan Univ.
Lei Zhang — Henan Univ.
Xiajiong Shen — Henan Univ.
Liyang Hou — Henan Univ.
Yihua Gao — Henan Univ.
Jun Sun — Henan Univ.

In this paper, a multi-step temperature prediction model based on geographic location and long-term memory neural network is proposed. In order to verify the validity of the data of surrounding cities, two sets of comparative experiments are carried out, that is, using 80-dimensional data of weather data added to surrounding cities and not joining the surrounding area. Urban weather data 8D data, 10D data added to surrounding city temperature data, and 1D data without temperature data of surrounding cities. The experimental results show that the model of adding weather data of surrounding cities in most cases has better prediction effect than the model of weather data without surrounding cities. The experimental results show that the model of weather data added to surrounding cities has better prediction effect.

9:00 - 17:00 WedP1.8

Creative Internet of Things (IoT) for Undergraduates, pp. 567-572.

Suk Jin Lee — Columbus State Univ.
Andrew Jung — Univ. of Hartford
Mira Yun — Wentworth Inst. of Tech.

When learners are learning another language, they confront a number of problems as each language is unique and carries its particular aspects. Learning to speak a new language is more than just learning words, phrases and sentences. The difficulties of a spoken language student become more when an adult student whose vernacular tongue belongs to syllable-time language such as Mandarin, is making an effort to learn a stress-time spoken language such as English.

9:00 - 17:00 WedP1.9

U-GAN: Generative Adversarial Networks with U-Net for Retinal Vessel Segmentation, pp. 642-646.

Cong Wu — Hubei Univ. of Tech.
Yixuan Zou — Hubei Univ. of Tech.
Zhi Yang — Hubei Univ. of Tech.

The retinal vascular condition is a reliable biomarker of several ophthalmologic and cardiovascular diseases, so automatic vessel segmentation may be crucial to diagnose and monitor them. However, existing methods have various problems in the segmentation of the retinal vessels, such as insufficient segmentation of retinal vessels, weak anti-noise interference ability. Aiming to the shortcomings of existed methods, this paper proposes an improved model based on the Generative Adversarial Networks with U-Net, which contains densely-connected convolutional network and a novel attention gate (AG) model in the generator, referred as U-GAN, to automatically segment the retinal blood vessels. The method can strengthen feature propagation, substantially reduce the number of parameters, and automatically learn to focus on target structures without additional supervision. By verifying the method on the DRIVE datasets, the segmentation accuracy rate is 96.15%, higher than that of U-Net and R2U-Net.

9:00 - 17:00 WedP1.10

Oil spills identification in SAR image based on Convolutional Neural Network, pp. 667-670.

Yaohua Xiong — Dalian Neusoft Univ. of Info.
Hui Zhou — Dalian Neusoft Univ. of Info.

Synthetic Aperture Radar (SAR) satellites can be used to detect the oil film diffusion caused by marine oil spill accidents. The automatic identification of oil slicks and look-alikes oil slicks can provide an important basis for decision-making of oil spill accidents. An oil spill SAR image recognition method based on convolutional neural network is presented in this paper, which automatically extracts category features and avoids the non-standardity of manual extraction methods. The original oil spill SAR image is filtered and denoised, before it is input into the CNN network, and the feature extraction is performed on the SAR image using the CNN model. Finally, the features are classified by Soft-max. Experiments have been carried out using ERS-2 SAR image data, and the results of the identification demonstrate that the proposed method has high accuracy in identifying "oil slicks" and "look-alikes oil slicks" images.

9:00 - 17:00 WedP1.11

Digital Logic Experiment Design Based on FPGA Development Board and OV2640 Camera, pp. 671-675.

Dongdong Zhang — TongJi Univ.
Zhenlei Xu — TongJi Univ.
Lisheng Wang — TongJi Univ.

Chunlin Song TongJi Univ.
Zhiyu Xu TongJi Univ.

This paper presents an experimental case for digital system design, based on the Xilinx Nexys4 DDR Artix-7 FPGA development board and the ov2640 camera. The experimental case uses a top-down design approach to divide the system into subsystems, and then design the subsystems and controllers separately, and finally implement the entire system function. This experiment can guide students to master digital system design methods, develop students' intelligence and improve their practical ability.

9:00 - 17:00 WedP1.12

Classification of diabetic retinopathy based on DSIRNet, pp. 692-696.

Cong Wu Hubei Univ. of Tech.
Dong Xia Hubei Univ. of Tech.
Jicheng Jin Hubei Univ. of Tech.
Zhi Yang Hubei Univ. of Tech.

In recent years, deep learning has achieved great success in computer vision, and has shown good application prospects in the use of computer vision to complete the reading of medical images.In response to the screening of diabetic retinopathy, this paper proposes a deep supervision of the Inception-Residual network(DSIRNet) to classify DR images end-to-end.The network combines the advantages of Inception module and residual module, which can not only learn multi-scale features, but also ensure the transmission of feature information between network layers. At the same time, this paper also uses deep monitoring method to assist the training network, which can improve the final classification effect of the network to a certain extent.In terms of data sets, data noise and sample distribution imbalances are also addressed.The effectiveness of the proposed model and method is verified by comparative experiments.

9:00 - 17:00 WedP1.13

Parameter Range in Hovering Control of Airship, pp. 697-702.

Long Huang Xiamen Univ.
Shaoping Shen Xiamen Univ.

Stratospheric airships have broad application prospects and great development potential in the fields of communication, observation and remote sensing. This paper analyzes the influence of external environmental changes on the rise of gas, airship quality and internal and external pressure difference, and calculates the variation of airship quality and displacement offset within one day of the airship's fixed-point dwelling conditions, which is conducive to the improvement of control scheme.

9:00 - 17:00 WedP1.14

Experimental Teaching Design for Programmable Features of SDN Northbound Interface, pp. 731-736.

Danhong Zhu Fuzhou Univ.
Dong Zhang Fuzhou Univ.
Binjie He Cisco Systems, Inc.
Chang Zhao Fuzhou Univ.
Xiang Chen Fuzhou Univ.

This paper presents a novel experiment teaching scheme for the control plane development of northbound applications in software defined networking (SDN). This scheme is designed to support the experiments of two commonly-used network applications, i.e., load balancing and network function virtualization. It is deployed on a virtual simulation experiment environment, which can be easily established in a timely manner.We have successfully integrated this experiment teaching scheme into the course of SDN in our university. With the support of this scheme, we not only provide students with meaningful practical guidance to learn northbound applications, but also help them better understand the programmable connotation of SDN. Furthermore, students can exploit the advantages of SDN to deploy new network services based on our proposed scheme, such that their ability of building practical and innovative network applications is enhanced.

9:00 - 17:00 WedP1.15

FittingGAN: Fitting image Generation Based on Conditional Generative Adversarial Networks, pp. 741-745.

Yanhua Li Henan Agricultural Univ.
Jianping Wang Henan Agricultural Univ.
Xiaomei Zhang Henan Agricultural Univ.
Yangjie Cao Zhengzhou Univ.

Recent studies have shown remarkable success in image generations using generative adversarial networks (GANs). However, how to deal with the fitting image generation, which is a task that generates a reasonable dressing image containing the input clothes is still an open problem. In this paper, we propose a condition generation model named FittingGAN which can achieve the generation of fitting scenes. The results show that It can generate fitting images with high resolution and realistic details, and FittingGAN have achieved good results in both qualitative and quantitative evaluations.

9:00 - 17:00 WedP1.16

Mobile Transaction Processing for a Distributed War Environment, pp. 856-862.

Romani Farid Ibrahim Mohammed Bin Na?f Academy for Marine Sci. & Security Studies

The battlefield environment differs from the natural environment in terms of irregular communications and the possibility of destroying communication and medical units by enemy forces. Information that can be collected in a war environment by soldiers is important information and must reach top-level commanders in time for timely decisions making. Also, ambulance staff in the battlefield need to enter the data of injured soldiers after the first aid, so that the information is available for the field hospital staff to prepare the needs for incoming injured soldiers. In this research, we propose two transaction techniques to handle these issues and use different concurrency control protocols, depending on the nature of the transaction and not a one concurrency control protocol for all types of transactions. Message transaction technique is used to collect valuable data from the battlefield by soldiers and allows top-level commanders to view it according to their permissions by logging into the system, to help them make timely decisions. In addition, use the capabilities of DBMS tools to organize data and generate reports, as well as for future analysis. Medical service unit transactional workflow technique is used to provides medical information to the medical authorities about the injured soldiers and their status, which helps them to prepare the required needs before the wounded soldiers arrive at the hospitals. Both techniques handle the disconnection problem during transaction processing. In our approach, the transaction consists of four phases, reading, editing, validation, and

writing phases, and its processing is based on the optimistic concurrency control protocol, and the rules of actionability that describe how a transaction behaves if a value-change is occurred on one or more of its attributes during its processing time by other transactions.?

9:00 - 17:00 WedP1.17

State-Time-Alignment Phone Clustering Based Language-independent Phone Recognizer Front-end for Phonotactic Language Recognition, pp. 863-867.

Wei-Wei Liu Tsinghua Univ.
Guo-Chun Li Tsinghua Univ.
Cun-Xue Zhang Tsinghua Univ.
Hai-Feng Yan Tsinghua Univ.
Jing He Tsinghua Univ.
Yan-Miao Song Tsinghua Univ.
Ying-Xin Gan Tsinghua Univ.
Jian-Zhong Liu Tsinghua Univ.
Ying Yin Tsinghua Univ.

The now-acknowledged sensitive of Phonotactic Language Recognition (PLR) technology to the performance of the phone recognizer front-end have spawned interests to develop many methods to improve it. In this paper a state-of-art State-Time-Alignment (STA) phone clustering approach to build language-independent phone recognizer is proposed in phonotactic language recognition system to balance the performance and the complexity of the speech tokenizing processing in PLR. Experiments are carried out on the database of National Institute of Standards and Technology language recognition evaluation 2009 (NIST LRE 2009) and the experimental results have confirmed that phonotactic language recognition system using the collaborated language model yields 1.84%, 5.55% and 16.82% in equal error rate (EER), which show that the STA phone clustering based phone recognizer front-end outperforms the original English and Mandaren phone recognizers and other phone clustering methods based phone recognizer.

9:00 - 17:00 WedP1.18

Research on Digital Image Design of Traditional Blue and White Patterns under the Background of the "Belt and Road", pp. 918-924.

Yuan Yang Shanghai Univ. of Eng. Sci.
Yifan Feng Shanghai Univ. of Eng. Sci.

As a treasure of Chinese ceramics techniques, blue and white porcelain has far-reaching influence on the development of culture and art in China and even in many countries around the world. Blue and white patterns also went through changes along with communication on the Silk Road. The time and geographical changes in ancient China and the introduction of foreign religions enabled the artistic forms of patterns on blue and white porcelain to reflect cultural inclusion and have a high cultural and aesthetic value. Focusing on the history of blue and white art, regional culture research, and the development of blue and white pattern design, this paper summarized the forms and aesthetic changes of traditional patterns on blue and white porcelain in different times and regions for further pattern creation. With the true history of the Maritime Silk Road and the spread of blue and white porcelain as background and digital image design as display method, this paper discussed the evolution of blue and white along the Belt and Road in historical process.

9:00 - 17:00 WedP1.19

Refining Factors of Healthy Motivations with Observed Data, pp. 970-975.

Yudai Takagaki Ritsumeikan Univ.
Dinh Dong Phuong Ritsumeikan Univ.
Fumiko Harada Connect Dot Ltd.
Hiromitsu Shimakawa Ritsumeikan Univ.

The paper proposes a method to estimate motivational factors for health promotion. To take healthful actions, we need motivations. Since motivational factors vary with individuals, approaches to improve our lifestyles depend on each person. The paper refines subjective estimation of motivational factors acquired with questionnaires with objective data observed from exercises users try for their health using a mathematical method, Non-negative Matrix Factorization. Through an experiment, we have confirmed the refinement enables us to estimate the strength of motivational factors of high objectivity. In addition, we have found recommended behaviors for each feature of motivational factors.

9:00 - 17:00 WedP1.20

Short-Term Traffic Flow Prediction and Its Application Based on the Basis-Prediction Model and Local Weighted Partial Least Squares Method, pp. 986-991.

Zhiyang Gu Xiamen Univ.
Sun Zhou Xiamen Univ.

Traffic flow forecasting is one of the key issues in smart traffic systems. The changing process of traffic flow involves high randomness, environmental interference and measurement noise, which bring difficulties to accurate traffic flow prediction. Aiming at improving the accuracy of short-term traffic flow prediction, this paper presents a basis-prediction model. A raw traffic flow series can be deemed as summation of a basis series that implies the changing trend of the traffic flow and a deviation series which represents the random interference information involved in the flow. The basis series mainly comprises low-frequency signals and some high-frequency ones compose the deviation series. The basis series and the deviation series can be obtained using wavelet decomposition of the raw traffic flow. The local weighted partial least squares (LW-PLS) method is adopted to predict the basis series and the result is used as the prediction of the raw traffic flow. Real data of traffic flow of Xinbei city, Taiwan province was collected and used for validation of the proposed basis-prediction model. The results show that the use of that model improves the accuracy of short-term traffic flow prediction by about 2% on average.

9:00 - 17:00 WedP1.21

CAT Tool: A Technical Wonder or A Vase?---An Empirical Study of CAT Tools, pp. 1029-1032.

Ji Li Zhengzhou Normal Univ.
Yi Wang Henan Univ. Minsheng College
Yu Li Henan Univ. of Economics & Law

Based on an empirical study of computer assisted translation (CAT) tools, this paper aims to prove that CAT tools are feasible, efficient and convenient, though they have limitations in the usage and problems for beginners, they are technical wonders which can help translators do numerous things to reduce their work load.

9:00 - 17:00 WedP1.22

Design an Ultra-low Adsorption Gas Sampling System for Ozone and Photochemical Continuous Online Monitoring Instruments, pp. 1053-1056.

Cheng Sun — Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Shaohua Li — Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Wei Zhou — Beijing Jiaotong Univ.
Wenjuan Peng — Beijing Jiaotong Univ.
Chao Gao — Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Yawei Li — Hebei Sailhero Environmental Protection Hi-teh Co.Ltd
Hui Wang — Hebei Sailhero Environmental Protection Hi-teh Co.Ltd

The paper discusses an ultra-low adsorption gas sampling system (UAGSS) for ozone and photochemistry continuous online monitoring instruments. To ensure sampling gas system's authenticity and timeliness, many issues such as structure design, adsorption problem, gas stay time, condensate problem, and temperature control are considered. The system composes of five parts: sampling upper tube, sampling lower tube, temperature control system, flow control system and height adjustable support. High-fidelity uniform sampling solves problems of sampling differences in ozone instruments and volatilization of components in sampling tube. Further experiment method is mentioned.

9:00 - 17:00 WedP1.23

Mining New Scientific Research Ideas from Quantum Computers and Quantum Communications, pp. 1063-1068.

Qiping Wei — The Univ. of Texas at Arlington
Fengxiang Zhang — Huazhong Univ. of Sci. & Tech.

This paper studies the significant scientific ideas presented in quantum computers and quantum communications. In quantum computers, a quantum has no precise position. It does not follow the causal law and does not hold repeatability. Quantum addition takes almost no time. A quantum (qubit) can present both "1" and "0" at the same time. In quantum communications, when two particles are entangled, one can transfer information to the other that can even across cosmic distance away without energy, time, and any "field" as medium. All these ideas together form a set of completely new ideas of "rational science", breaking through the concepts of classical science. However, the slow research progress of quantum computers and quantum communications reflects that people's knowledge of scientific ideas is very limited. This paper is to discuss the evolution of scientific ideas inspired by quantum computers and quantum communications for further mining the scientific research ideas.

9:00 - 17:00 WedP1.24

3D Human Body Inpainting using Intrinsic Statistical Shape Models, pp. 1099-1104.

Matthew Korban — Louisiana State Univ.
Xin Li — Louisiana State Univ.
Kehua Miao — Xiamen Univ.
Yimin Zhu — Louisiana State Univ.

This paper presents an algorithm for inpainting 3D human body geometry. We built a Statistical Shape Model (SSM) based on the intrinsic Laplacian Coordinates (LC) to tackle the pose variation of human bodies, which is a common challenging issue in 3D human body modeling and shape analysis. We evaluate our inpainting algorithm using synthesized damages on omplete human body scans, and with the groundtruth we measure the normalized reconstruction error uantitatively. Our experiments demonstrate the effectiveness of this LC-based SSM in human body inpainting.

WedP2 — UA1140
Education & New Tech-II

9:00 - 17:00 WedP2.1

The Techniques and Evaluation method for Beautification of Handwriting Chinese Characters based on Cubic Bézier Curve and Convolution, pp. 502-511.

Pengli Du — Beijing Language & Culture Univ.
Yingbin Liu — Beijing Language & Culture Univ.
Endong Xun — Beijing Language & Culture Univ.

This paper presents a method to beautify Chinese characters and a way to evaluate the beautification result. In order to make handwritten Chinese characters more in line with the aesthetic standards of Chinese characters, 52 Chinese characters were selected as experimental data. These data covered 33 standard strokes and 19 typical structures of Chinese characters. The handwritten Chinese characters were beautified mainly from two aspects - the global adjustment and the elimination of jitter. Firstly, the two-dimensional (2D) data points set with uneven densities are processed into cubic Bézier curve control points to adjust the data sparsity. So that the current data can retain the original data features to the maximum extent without changing the shape of Chinese characters. At the same time, in order to use the geometric features of Chinese characters, the centroid point, 2D Chinese characters are extended into three-dimensional (3D) space. Then the Gaussian Mixture Model (GMM) is established for the data set, and the layout of handwritten Chinese characters is adjusted by point set registration algorithm. Secondly, according to the properties of the cubic Bézier curve function, detect the jitter of each strokes, and eliminate the jitter by interpolation algorithm. The evaluation of the results after beautification has always been limited to subjective evaluation. This paper attempts to combine the evaluation of beautification result with machine learning methods. Handwritten Chinese character recognition (HCCR) is used as the tool. It is based on Convolution Neural Network (CNN), and the recognition rate of handwritten Chinese characters reaches about 95%. Experiments show that the overall layout and jitter of handwritten Chinese characters have been adjusted and deleted, and the evaluation of handwritten Chinese characters beautification results has its research significance.

9:00 - 17:00 WedP2.2

A Students' Action Recognition Database In Smart Classroom, pp. 523-527.

Xiaomeng Li — Ocean Univ. of China
Min Wang — Ocean Univ. of China
Wei Zeng — Ocean Univ. of China
Weigang Lu — Ocean Univ. of China

With the development of human action recognition, it is possible to automatically recognize students' actions in classroom, providing a new direction for classroom observation in teaching research. Training effective students' action recognition algorithms depends significantly on the

quality of the action database. However, only a few existing action databases focus on learning environment. In this paper, we contribute to this topic from two aspects. First, a novel students' action recognition database is introduced. The spontaneous action database consists 15 action categories, 817 video clips of 73 students, which are collected in real smart classroom environment. Second, a benchmark experiment was conducted on the database using two kinds of recognition algorithms. The best result is achieved b??y Inception V3 with 0.9310 accuracy. Such a spontaneous database will help in the development and validation of algorithms for action recognition in learning environment.

9:00 - 17:00 WedP2.3

Automatic Academic Confusion Recognition In Online Learning Based On Facial Expressions, pp. 528-532.

Zheng Shi Ocean Univ. of China
Ya Zhang Ocean Univ. of China
Cunling Bian Ocean Univ. of China
Weigang Lu Ocean Univ. of China

Academic confusion is one of the most common academic emotions, timely identification and resolution of confusion are helpful to improve learning effect. In the research, a model is developed to identify the academic confusion in online learning based on facial expressions. The model mainly includes three parts: confusion-inducing experiments, image preprocessing, and recognition methods comparing. Firstly, a set of confusion-inducing experiments in online learning are designed. Then the images are preprocessed to improve the recognition effect. In the third part, Histogram of Oriented Gradient (HOG), Local Binary Patterns (LBP), Support Vector Machine (SVM) and Convolutional Neural Network (CNN) are combined to form four methods of HOG-SVM, LBP-SVM, CNN and CNN-SVM, which are employed. The experimental results show that most of the methods can effectively detect students' academic confusion, and the CNN-SVM has the best predictive performance with an average accuracy of 0.938. The Model proposed in this study can provide a technical support for learner emotional modeling of teaching assistant systems.

9:00 - 17:00 WedP2.4

Research on Mobile Digital Early Education Model Based on "Parent-Child Accompanied Reading" Software, pp. 556-560.

Xiaoting Deng Xiamen Univ.
Xifeng Wang Xiamen Univ.
Yi Shen Xiamen Univ.
Pingping Gu Xiamen Univ.
Yuhui Zheng Xiamen Univ.

The infant period before the age of 6 is the key period for each person's growth and development in his life. At this stage, infants' intelligence, physical strength, and psychological development are the fastest, and family education is an indispensable and important link. However, due to irresistible factors such as going out to work, many parents accompany their children for a very limited time or even cannot live together. However, the lack of accompanying children's soul will be hurt, and even affect early education. Therefore, this paper takes "parent-child accompanying reading" software as a case study, and proposes a mobile digital early education model based on the Internet and cloud platform, especially for the long-term and short-term left-behind children to provide them with parents' long-distance accompanying reading early education platform. With the rapid development of mobile client and Internet technology, the platform can easily record, broadcast and manage the audio materials of parents' original reading picture books. The purpose of the platform is to effectively alleviate the psychological trauma of children who lack the care of escort, and gradually cultivate children's early reading habits and promote their mental development.

9:00 - 17:00 WedP2.5

An E-learning Support Middleware with MOOC course recommendation, pp. 596-600.

Tian Xia Shanghai Second Polytechin Univ.

Nowadays, more and more MOOC systems are established in universities with massive and growing courses. However, the students, or called E-learners, outside the campus are hard to get assistance of teachers or educational department to design an appropriate learning route to their desired occupations. Although they may have a part time teacher in campus, such work is often overlooked due to efforts and time limitation.?In this paper, an E-learning Support Middleware with MOOC course recommendation is put forward. This middleware leverage Vector Space Model(VSM) and be able to automatically recommend appropriate courses according to the descriptions of the capabilities of the desired occupations and the descriptions of courses. This study is able to help the off-campus students arrange their study.?

9:00 - 17:00 WedP2.6

The application of mixed teaching mode in programming courses, pp. 627-630.

Na Lv Univ. of Jinan

Against the traditional teaching mode, the beginners generally feel that the concepts in the programming courses are abstract and the programming ability is difficult to improve. Analyzing the teaching contents and the key difficulties in the teaching activities, we put forward the mixed teaching mode which combines the MOOC teaching mode and the traditional classroom teaching mode. This teaching mode can make full use of the existing online resources to construct course, and focus on arousing the learners' autonomous learning motivation and the mutual cooperation ability within study groups. The teaching practice shows that this mixed teaching mode can better improve the learning interest and practical programming ability of the students compared with the traditional teaching mode.

9:00 - 17:00 WedP2.7

Exploration of Software Development Training Program in Vocational Colleges Based on OBE-CDIO, pp. 681-685.

Yandong Wen Dalian Neusoft Univ. of Info.

Through introducing the situation of software industry and the demand of software engineer currently,we analyze some problems in college education. Based on OBE-CDIO education model, a talent training scheme for application-oriented software talents is given out to current software engineer training: the job requirements of software talent, professional requirements and competencies, setting the desired " learning output". Following the principle of " Backtracking design", we develop a curriculum system with student-centered by reverse order. Last, Software talent the reasonable position on training, the core curriculum development, the curriculum content updating, the education method and form innovation. Deepen the cooperation between schools and enterprises, improving teachers' practical ability, constructing the Five - level Practice System at Different Levels, adopting the checkpoints flipped classroom model to improve the quality of graduates.

9:00 - 17:00 WedP2.8

A Multi-Evaluation System of Students'Learning towards Programming Course based on Blend Learning Environment, pp. 737-740.

Qingchun Hu East China Univ. of Sci. & Tech.

Yong Huang — Shanghai Audio-video Edu. Center, Shanghai,
Liping Deng — Hong Kong Baptist Univ.

The items used for learning evaluation in online learning are not only scores, but also students' learning behavior, including engagement in learning contents, activities in online forum. This paper proposes a multivariate learning evaluation model to assess students learning in online learning environment for programming course. The learning behavior is accessed by data flow. The data flow is divided into four categories, which includes learning guidance, understanding innovation, interactive sharing and learning support. The correlation analysis of various structures and unstructured data flow generated in learning activities will be embodied in the multiple learning evaluation model as parameters. And the results are visualize to learners. The findings show that multivariate learning evaluation is helpful to improve students' achievement and reflection towards their learning.

9:00 - 17:00 WedP2.9

Problems and solutions of MOOC application in provincial colleges and universities, pp. 796-801.

Jingya Wang — Shandong Univ. of Finance & Economics
Peiguang Lin — Shandong Univ. of Finance & Economics
Yu Li — Shandong Univ. of Finance & Economics
Ruixia Xu — Shandong Univ. of Finance & Economics
Peiyao Nie — Sanya College
Yuyan Xu — Shandong Univ. of Finance & Economics

Since 2012, the emergence of MOOC has swept the world like a tsunami in recent years. Our country has explored online education and MOOC and pays more and more attention to the modernization and information construction of higher education for about ten years. We found that promoting the implementation of MOOC in schools has become an important concern of colleges and universities. By investigating the actual situation of MOOC teaching in Universities in Shandong Province, we find that there are still many places worthy of further study on the implementation strategies of MOOC in universities. Based on the above facts, we first put forward the problems existing in the application of MOOC in Colleges and universities from the aspects of MOOC platform, universities and teachers. Then, we put forward the corresponding solutions to the problems. Finally, we provide relevant suggestions for the promotion of MOOC teaching in higher education.

9:00 - 17:00 WedP2.10

Research on the Problems and Countermeasures of the Co-construction of School-enterprise Cooperation in Undergraduate Colleges in Shandong Province, pp. 802-807.

Yuyan Xu — Shandong Univ. of Finance & Economics
Yu Li — Shandong Univ. of Finance & Economics
Yixuan Wu — Shandong Univ. of Finance & Economics
Peiguang Lin — Shandong Univ. of Finance & Economics
Peiyao Nie — Sanya College
Jingya Wang — Shandong Univ. of Finance & Economics

In recent years, under the new situation of deepening the integration of production and education and promoting the implementation of the transformation of old and new kinetic energy, the school-enterprise cooperation and the common mode of running schools have become increasingly popular. In recent years, the number of school-enterprise cooperation programs in undergraduate colleges in Shandong Province has been increasing rapidly. However, there are still many places worthy of further exploration in the details of school-enterprise cooperation. How to promote the healthy development of school-enterprise cooperation has become a flash point for scholars. This paper first expounds the background, significance ,purpose of the topic and the status quo of domestic and foreign scholars' research on school-enterprise cooperation, and then by means of different forms of research, mining and analyzing data from students, enterprises and schools. This paper extracts some problems in the process of school-enterprise cooperation in undergraduate colleges and universities, and proposes constructive countermeasures based on the analysis results in order to promote the healthy development of school-enterprise cooperation in Shandong undergraduate colleges.

9:00 - 17:00 WedP2.11

Teaching Practice and Thinking of SPOC-Rain Classroom Based Flipped Classroom in the Network Technology and Application Course, pp. 814-819.

Sujun Hu — Nanjing Univ. of Posts & Telecommunications
Haiping Huang — Nanjing Univ. of Posts & Telecommunications
Xuemei Wang — Nanjing Univ. of Posts & Telecommunications
Peng Li — Nanjing Univ. of Posts & Telecommunications
Ruchuan Wang — Jiangsu High Tech. Research Key Lab. for Wireless Sensor Networks

The rapid advancement of Internet has improved the quality of life, changed the social development mode and transformed public learning style. The issues need to be seriously considered by the majority of educators are how to adapt to the modernization of education in the new situation, how to overcome the shortage of traditional classroom teaching model, how to embody the teaching concept of student-centered, and how to instruct students in accordance of their aptitude. This paper elaborates on the teaching implementation process in the SPOC (Small Private Online Course)-Rain Classroom based flipped classroom model, taking the "Network Technology and Application" course of Nanjing University of Posts and Telecommunications (NJUPT) as a pilot. The model is mainly based on small class teaching mode and applied in the three major stages: pre-class, in-class and post-class. In this paper, the implementation effects and some existing problems are analyzed. And the summary and prospect are also proposed in the last section.

9:00 - 17:00 WedP2.12

A Full-Chain Innovative Ecological Environment for Postgraduate Education, pp. 820-825.

Degui Xiao — Hunan Univ.
Kenli Li — Hunan Univ.
Jiawei Luo — Hunan Univ.
Zhiyong Li — Hunan Univ.

Practical teaching plays a key role in postgraduate innovation education. To solve the practical teaching problem of engineering postgraduate students, a full-chain innovative ecological environment (FIEE) is proposed. FIEE has been constructed by relying on the National Supercomputing Center (NSC) with major scientific research and application projects as the driving force. FIEE is constructed as a three-level practical teaching

system, including practical courses pool, integrated practical platforms and domain application innovation platforms. Practical courses have been jointly constructed. Integrated practice platforms consist of common algorithm libraries, general AI software, scientific computing and engineering simulation software. Domain application innovation platforms have been created with a cross-disciplinary and school-enterprise cooperating way. And FIEE is also a double-coupled system, including the supercomputing based virtual simulation part and that of physical instruments, devices and reality platforms. FIEE has chained the whole process of postgraduate training in our college, domain users and even cross-school demonstration units. FIEE has been widely used in our college to systematically train postgraduate students' abilities of condensing scientific issues, independently engaging in academic research or technological innovation, and cross-disciplinary cooperation. FIEE has also provided innovation training for cross-school students and innovation platforms for domain applications.

9:00 - 17:00 WedP2.13

Research on Project-Based Teaching Quality Evaluation Based on Fuzzy Cluster Analysis, pp. 826-829.

Pingzhang Gou Northwest Normal Univ.
Shanshan Song Northwest Normal Univ.

In view of the traditional teaching quality evaluation method is not applicable to project of teaching quality evaluation problem,taking the "scientific computation and visualization" in the "Python Language Programming" course as an example, the project is divided into five sub-projects, re-construct the teaching quality evaluation system including 4 first-level indicators such as teaching attitude, teaching method, teaching content and teaching effect .It also includes 24 second-level indicators. Through the questionnaire survey of project quality teaching, the fuzzy clustering method is used to cluster the survey results, which gives the corresponding evaluation. The feasibility and effectiveness of fuzzy clustering method in analyzing the quality of project teaching are verified.

9:00 - 17:00 WedP2.14

Research and Development of Automatic Assessment Strategy for ERP Practical Skills Based on MOOC, pp. 835-839.

Runxin Yang Beijing Language & Culture Univ.
Ruohui Wang Beijing Language & Culture Univ.
Jimei Li Beijing Language & Culture Univ.

In recent years, teaching, testing, competing and training of ERP practical skills have been developed rapidly and the enterprises' demand of ERP practical and the qualified personnel is increasing. However, since the ERP software is developed for enterprise applications, it does not have the function of automatic assessment. In addition, because the MOOC platform breaks the time and space constraints, and can meet the basic functions of ERP software teaching and learning, therefore, according to the characteristics of ERP system, this paper develops a strategy of automatic assessment for ERP practical skills based on MOOC. The results applied to the actual ERP course show that the strategy has the functions of automatic marking criteria setting, automatic scoring and detailed feedback, which can greatly reduce the workload of teachers and the volume of scoring, and improve the quality of the feedback.

9:00 - 17:00 WedP2.15

A Empirical Study of Programming Behaviours on Large Scale Online Learning, pp. 889-894.

Menghua Cao National Univ. of Defense Tech.
Qian Zhang National Univ. of Defense Tech.

Traditional teaching methods for programming mainly pay attention to the final artifacts but ignore the process such as the history of test failures and code change. In recent years, modern online programming learning platforms can record the student's behavioral data, which are drawing more and more attention by higher education institutions. Analyzing behavioral data in the modern learning systems can help users understand the students' behavioral patterns in order to design good teaching programs. In this paper, we first focus on the relationship between the time of completing a course and the average test time of fixing test failures. Using the K-means algorithm, we then cluster the error types into four categories based on three factors. The error types can help students master their own error patterns and provide guidance for teachers to grasp the knowledge blindness of the students.

9:00 - 17:00 WedP2.16

Exploration of New Teaching Method Applied in C++ Course Combined Student's Majors, pp. 903-906.

Tianyong Guo Nankai Univ.
Yan Li Nankai Univ.
Mingxiao Lu Nankai Univ.
Yun Guo Nankai Univ.

In order to solve the problems emerged in traditional C++ programming class, and to meet the different needs for computational thinking and programming skill of students of different majors, this paper proposed a new teaching method, which combines C++ programming skill with knowledge related to students' academic majors. This new teaching method delivers C++ knowledge by using study cases closely related to students' majors; at the same time, electrical circuits are adopted to demonstrate study cases to help students better understand the course contents, and get deeper comprehension of the concept of computational thinking from this introductory programming course. Through the study and practice, this new teaching method was proved to achieve better teaching outcome in cultivating students' computational thinking and innovative ability, so as to lay a solid foundation for students' follow-up study in their major fields.

9:00 - 17:00 WedP2.17

Empirical Study on Rain Classroom: A Tool for Blended Learning in Higher Education, pp. 976-980.

Youjie Chen Tsinghua Univ.
Shuaiguo Wang Tsinghua Univ.
Xinjie Yu Tsinghua Univ.

An interactive learning tool named Rain Classroom was developed to facilitate teachers better implement blended learning, and enhance communication between teachers and students. The paper presents its design principles, system architecture, and applications. An empirical study of 130 participants was conducted to evaluate the effectiveness of the tool. Positive results are shown both in students' learning performances and attitudes toward Rain Classroom.

9:00 - 17:00 WedP2.18

Chinese EFL learners' perception of Synchronous-Computer-Mediated Communication in conducting online interactive tasks, pp. 981-985.

Mingfei Xu — Minzu Univ. of China
Simin Zeng — Harbin Inst. of Tech., Shenzhen

This study aims to investigate the perception of Chinese English-as-a-Foreign-Language (EFL) students towards the influence of Synchronous-Computer-Mediated Communication (SCMC) on conducting interactive online tasks. 48 EFL students studying mechanical engineering in a Chinese university who participated in 5-week online tasks filled out two questionnaires before and after tasks; 11 of them attended an interview afterward. The questionnaire data show that participants enjoyed conducting tasks and receiving and providing corrective feedbacks online. Perceived benefits and difficulties, and comparison with face-to-face are discussed. In the end, the pedagogical implication is drawn.

9:00 - 17:00 WedP2.19

Study on Sample Size of Candidates Oriented to Online Test, pp. 1000-1004.

Yanbin Feng — Beijing Language & Culture Univ.
Yong Qiao — Beijing Language & Culture Univ.
Xiaoxia Zhao — Beijing Language & Culture Univ.
Jimei Li — Beijing Language & Culture Univ.

The sample size directly affects the accuracy of the item parameter estimation of the online test. We simulate several tests comprised of 5 items, 9 items, 21 items and 41 items with different difficulties. Then, the Monte Carlo method is used to simulate candidates' answers to test items by Rasch response model. From this, we calculate the error metric of the test item distribution under different sample sizes. By comparing the real data with simulation data, we find that the fitting effect is good.

9:00 - 17:00 WedP2.20

Research on Key Attributes of Learning Behavior Based on Rough Set, pp. 1024-1028.

Pengyu Liu — Tianjin Normal Univ.
Guiyun Zhang — Tianjin Normal Univ.

MOOC becomes a common learning method in colleges and universities. Data analysis through MOOC recorded data to find key attributes that affect learner performance, this is one of the current research directions of educational big data. In this paper, using the record data of 500 learners on the MOOC platform, the rough set attribute reduction algorithm is used to mine the key attributes affecting the learner's performance, finally get six key attributes. Describes the links between the sixkey attributes and achievements. Through the analysis and research of learning behavior data, this paper puts forward suggestions for improving the quality of MOOC learning, and provides reference for the development of MOOC.

9:00 - 17:00 WedP2.21

A Comparative Study of Literary Translation Abilities by Major Online Translation Tools, pp. 1033-1038.

Shuangchu Li — Univ. of Bristol
Yu Li — Henan Univ. of Economics & Law

This paper reports a comparative study of literary translation abilities by four major online translation tools, including Google, Bing, Baidu and Youdao. The results show that the online translation tools' performances in literary translation at present are not as good as imagined in lexical level, cultural level and rhetorical level. Anyway, with the development of artificial intelligence and information technology, the literary translation abilities of those online translation tools will be improved.

9:00 - 17:00 WedP2.22

A Methodology for Incorporating Creativity into Lesson Plans, pp. 1039-1043.

Diana Ragbir-Shripat — The Univ. of the West Indies
Permanand Mohan — The Univ. of the West Indies

This paper presents a methodology for incorporating creativity in lesson plans. The methodology consists of 5 steps designed to elicit the creative thinking of learners based on the Process and Place aspects of creativity research. The final step of the methodology results in the production of a lesson plan (or learning design) for drawing out creativity in learners without adding additional topics to a lesson. The paper also describes a software prototype, The Muse, which was developed to evaluate the methodology. The evaluation involved a teacher using The Muse to create a lesson plan, successfully following all the steps of the methodology. Additionally, The Muse executed this lesson plan, which students followed successfully for six weeks as they worked on a creative project. The research described in the paper makes an important contribution to creativity research by showing how a learner's creative process can be tracked digitally, in real-time.

9:00 - 17:00 WedP2.23

Project-driven information talents training mode in opening environment, pp. 1048-1052.

Hong Song — Central South Univ.
Dandan Lin — Central South Univ.
Ping Zhong — Central South Univ.
Yu Sheng — Central South Univ.
Weiping Wang — Central South Univ.

To cultivate the information talents with independent innovation ability is an important target of deepening reform in universities. This paper analyzes the problems in current practical teaching process of information majors and provides a new project-driven information talents training mode in opening environment. The new mode reconstructs practice teaching system by adding two experimental courses and three curriculum design courses, designs a multi-layer and multi-objective project resource library for students' studying. It also reforms the management of laboratory to let students learn or practice in any time and at any place. The teachers can motivate the students by projects and monitor the project-developing process by using an opening communication platform. The results show that the new mode is a beneficial exploration in information talents training with independent innovation ability.

9:00 - 17:00 WedP2.24

OBE-Based Reform for Software Project Management Curriculum, pp. 1069-1073.

Liping Li — Shanghai Polytechnic Univ.
Na Wang — Shanghai Polytechnic Univ.
Tang Shan — Shanghai Polytechnic Univ.

OBE (Outcome-based education) is a comprehensive method that distinctly defines what students should achieve, and then organizes the curriculum, teaching activities and assessment to ensure the prospective outcomes. Based on OBE, this paper introduces the teaching objectives, graduation requirements and supporting indicator points of software project management curriculum. In order to achieve these graduation requirements, this paper proposes some reform ideas, such as Teacher-centered is changed to Student-centered and project-driven, scenario animation show, teaching rhythms, cases study and team work practice etc. We hope that these reforms will be helpful in promoting students to meet their graduation requirements.

9:00 - 17:00 WedP2.25

Discussion and Practice of Computer Practical MOOC, pp. 1089-1093.

Quansheng Yang Southeast Univ.
Shanshan Li Tsinghua Univ.

MOOC is a large-scale, open and networked online course model emerging recently, but engineering practice MOOC courses are few. Firstly, this paper analyses the problems encountered in the teaching of engineering practice MOOC, and puts forward the scenario planning method of this kind of MOOC and the scheme to ensure the communication between teachers and students and the acceptance of experimental results. Aiming at the problem that engineering practice MOOC is difficult to do experiments remotely, a virtual experiment system for hardware circuit design based on virtual reality is developed. On the basis of this solution, MOOC course of "Computer Systems Integrated Design" was offered. Practice has proved that the MOOC course offered under this scheme has achieved good results.

WedP3 UA1220
Data Science & AI-II

9:00 - 17:00 WedP3.1

Intelligent Human-Computer Interaction: A Perspective on Software Engineering, pp. 488-492.

Liannan Lin South China Univ. of Tech.
Jingyan Qiu South China Univ. of Tech.
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The design of traditional human-computer interaction courses is facing new challenges due to the breakthrough of the third generation of AI technology. New human-computer interaction scenarios, such as smart home and driverless cars, keep on emerging. More natural and efficient intelligent interaction methods are widely used in these scenarios, generating brand-new user experience. Combined with an example on the interactive design of intelligent products and the previous experience on teaching, in this article, an innovative design of human-computer interaction courses is introduced from the perspective on innovative content, cultivation of talents, and practice of software engineering.

9:00 - 17:00 WedP3.2

Architectures for Intelligent Assessment on Complex Information System Skills, pp. 579-584.

Ruohui Wang Beijing Language & Culture Univ.
Jimei Li Beijing Language & Culture Univ.

Following these patterns, a case study was conducted with 50 final year university undergraduate students' whose vernacular tongue is syllable-time such as Sinhalese or Tamil. The final year undergraduate students who learn English aiming to spot the difficulties they face in using correct intonation and to illustrate the importance of correct intonation in the process of learning and teaching another language. The results of the study indicate that there is a considerable amount of sentence stress problems among the students of spoken English.

9:00 - 17:00 WedP3.3

Research on Method of Tree Structure Selecting Optimal Medication Granularity Based on of Multi-granularity Decision System, pp. 601-605.

Yu Xue Henan Univ.
Xiajiong Shen Henan Univ.
Lei Zhang Henan Univ.
Daojun Han Henan Univ.
Tongyuan Qi Henan Univ.

In recent years, the cancer incidence rate has generally increased on a global scale and there are around a thousand anticancer drugs available in the market now. Doctors can only choose effective drugs based on existing knowledge and experience without automated tools. The granularity selection about the drugs is consistent with multi-granularity decision making system for optimal granularity. The system mainly stems from two parts, global and local optimal granularity selections. This paper proposes to use the tree structure to select the global optimal granularity by improving traditional method and providing the specific algorithm. Parallel processing is conducted to solve the long-time consumption problems. To conclude is the tree structure can efficiently save plenty of time to solve the global optimal granularity problems by comparative analysis. Besides, the larger the amount of patient data, the more time saved. The local optimal granularity selection with parallel processing can save nearly half of the time, which provides automated aids and more time for doctors to choose better anticancer drugs.

9:00 - 17:00 WedP3.4

Artificial Intelligence to Assist E-Learning, pp. 653-654.

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Teaching norms are taught through the way of large class teaching. Nowadays, most of the teaching method is still dependent on physical classes. Therefore, it's hard to design individual lesson based on different students' ability to achieve fundamental education. Good teaching is" According to the ability, ambition and interest of different learners, give appropriate teaching methods". Therefore, this paper is analysis students learning effectiveness through artificial intelligence adjusting the learning content and curriculum according to different learners to give learners the most appropriate learning style. The design can achieve personalized learning and auto-didacticism and instant feedback to meet the learners' different learning styles and thus improve the overall learning benefits.

9:00 - 17:00 WedP3.5

Research on the Disciplinary Evolution of Deep Learning and the Educational Revelation, pp. 655-660.

Xue Wang — Beijing Inst. of Tech.
Haiyan He — Beijing Inst. of Tech.
Ping Li — Beijing Inst. of Tech.
Lei Zhang — Renmin Univ. of China

The significant growing popularity of Artificial Intelligence education is coincidence with the aggressive application of AI technology in modern society. Taking articles titled with "deep learning" and their citations from Web of Science core collections as an example, the disciplinary evolution and interdisciplinary progress of this field are analyzed and visualized. The interdisciplinary characteristics of different countries represent different directions and tendencies of scientific research and technique development on deep learning. Following the rule of theoretical and technological development of AI techniques, especially the interdisciplinary, reform of AI education need to focus on interdisciplinary in both education mode and curriculum content, deep integration of research and education, and close cooperation of industry, universities, and research institutes.

9:00 - 17:00 WedP3.6

Keyword Analysis and Topic Extraction of Hospital Violence News, pp. 709-713.

Daoli Dong — Guangdong Univ. of Foreign Studies
Ji Li — Guangdong Univ. of Foreign Studies

Currently disputes between doctors and patients have increased in China, as has hospital violence. How to improve the relationship between them is an important problem. This paper focuses on the online news about hospital violence from 2013 to 2018. If we can find out the characteristics of hospital violence news, we will have some possibilities to help to improve the doctor-patient relationship from the point of media coverage. In this study, we collect 90,499 news articles in total from online mainstream media, such as People's Daily, Tencent News, NetEase News, etc. First, we analyze the news by extracting keywords using three algorithms as word frequency, TF-IDF and TextRank respectively. The results are compared and TextRank is shown the most effective. Second, we analyze the news by building the Latent Dirichlet Allocation topic model and extract news topics automatically. And then these topics are grouped into five themes. Finally, we discuss the characteristics of hospital violence news according to the keywords and topics.

9:00 - 17:00 WedP3.7

Suggestions on Accelerating the Implementation of Artificial Intelligence Technology in University Information System, pp. 767-770.

Kun Niu — Beijing Univ. of Posts & Telecommunications
Cheng Cheng — Beijing Univ. of Posts & Telecommunications
Hui Gao — Beijing Univ. of Posts & Telecommunications
Xinjie Zhou — Beijing Univ. of Posts & Telecommunications

In order to cope with the challenge of New Engineering Education, to make up for the insufficiency of high quality educational resources in colleges and universities, the single form of teaching, and the lack of individualized and innovative education, we recommend intelligently reconstruct or upgrade the university information system by using emerging technologies such as "artificial intelligence" as the core and taking cultivating high-quality innovative talents as the ultimate goal, thereby improving the information-based teaching environment of college education in China, improving the quality of teaching, reducing the cost of high-quality teaching resources, accelerating the process of educational intelligence in China's colleges and universities, and realizing the strategy of strengthening the country through education.

9:00 - 17:00 WedP3.8

A Method of Speaker Recognition for Small-scale Speakers Based on One-versus-rest and Neural Network, pp. 771-774.

Qingyun Sun — Xiamen Univ.
Linkai Luo — Xiamen Univ.
Hong Peng — Xiamen Univ.
Chaojie An — Shenzhen Research Inst. of Xiamen Univ.

There are a large number of application for the speaker recognition with a small size of speakers. A characteristic for this type of application is that the number of speakers is often changed slightly. To adapt this characteristic, we apply one-versus-rest(OvR) and neural network to implement speaker recognition. The task is first split into a series of binary classification problems by OvR strategy. The binary classification problems are then solved by neural network and the recognition result is obtained by the simple majority voting. When a few speakers are added to the set of speakers, we can only train the binary classifiers for the newly added speakers. The experiment on a dataset with small-scale speakers shows that both the recognition accuracy and the time cost is satisfactory, which indicates that the method is effective and feasible.

9:00 - 17:00 WedP3.9

A Single-channel BSS Method Based on ICEEMDAN and FastICA and Its Application in EMI Analysis, pp. 780-784.

Hongyi Li — Beihang Univ.
Wei Lin — Beihang Univ.
Di Zhao — Beihang Univ.

In the field of electromagnetic compatibility, electromagnetic interference (EMI) has always been a difficult problem for researchers. In order to achieve accurate separation of single-channel EMI signal, this paper proposes a one-stop method based on ICEEMDAN and FastICA. Firstly, the ICEEMDAN algorithm is used to extract several intrinsic mode functions (IMFs) from a single-channel mixture. Secondly, the multi-dimensional signals are reconstructed according to the IMFs and the original aliasing signal and separated by the FastICA algorithm. Finally, the feasibility of the proposed method is proved by experiments. Compared with the existing methods, it has better separation effect, which provides a reference for solving EMI problems.

9:00 - 17:00 WedP3.10

Security Analysis and Improvement of Hybrid Signcryption Scheme Based on Heterogeneous System, pp. 840-845.

Shijin Li — Yunnan Univ. of Finance & Economics
Fushou Tao — Yunnan Univ. of Finance & Economics
Ting Shi — Yunnan School of Business, Info. & Eng.

The heterogeneous hybrid signcryption scheme can not only solve the problem that only the short message can be encrypted in the traditional public key signcryption, but also realize the secure communication between different cryptosystems. Firstly, the security analysis of a

heterogeneous hybrid signcryption scheme shows that the scheme does not satisfy confidentiality and unforgeability. In order to enhance security, an improved heterogeneous hybrid signcryption scheme is proposed. Based on the bilinear Diffie-Hellman problem and discrete logarithm problem, the new scheme is proved to satisfy confidentiality and unforgeability. Compared with the original solution, the new solution reduces the computational overhead while improving security.

9:00 - 17:00 WedP3.11

Research on Navigation Based on Target Maneuver, pp. 878-882.

Xiaoli Qin — Sci. & Tech. on Space Physics Lab.
Ming Liu — Sci. & Tech. on Space Physics Lab.
Ming Yang — Sci. & Tech.on Space Physics Lab.

The performance of PN and APN was compared in this paper, especially the guidance system with acceleration saturation. The results show that the acceleration of the missile using PN must be 5 times higher than that of the target in order to intercept successfully, however, the acceleration using APN need only 2 times than target maneuver and can gain the same precision.

9:00 - 17:00 WedP3.12

A Research on Generative Adversarial Networks Applied to Text Generation, pp. 913-917.

Chao Zhang — Hubei Univ. of Tech.
Caiquan Xiong — Hubei Univ. of Tech.
Lingyun Wang — Hubei Univ. of Tech.

Using deep learning methods to generate text, a sequence-to-sequence model is typically used. This kind of models is very effective in dealing with tasks that have a strong correspondence between input and output, such as machine translation. Generative Adversarial Networks(GAN) is a generation model that has been proposed in recent years,which has achieved good results in generating continuous and divisible data such as images. This paper proposes an improved model based on GAN, specifically using the transformer network structure instead of the original general Convolutional Neural Network or Recurrent Neural Networks as generator, and using the reinforcement learning algorithm Actor-Critic to improve the model training method. By comparing experiments, and selecting the perplexity, the BLEU score, and the percentages of unique n-gram to evaluate the quality of the generated sentences. The results show that the improved model proposed in this paper perform better than comparative models on above three evaluation indexes. This verifies its effectiveness in text generation.

9:00 - 17:00 WedP3.13

Differential Evolution Algorithm Based on a Competition Scheme, pp. 929-934.

Seyed Jalaleddin Mousavirad — Ontario Tech Univ.
Shahryar Rahnamayan, SMIEEE — Ontario Tech Univ.

Differential Evolution (DE) is a simple yet powerful population-based metaheuristic algorithm to solve global optimization problems. In this paper, a novel differential evolution is proposed based on the competition among candidate solutions. In the proposed algorithm, the candidate solutions are divided into two groups including losers and winners based on a competition among candidate solutions. Winners generate new candidate solutions based on the DE's standard mutation and crossover operators, whereas losers learn from the winners. To this end, both crossover and mutation are changed for the loser ones. Competition is not performed in each iteration. In this regard, a new control parameter representing the competition period is introduced. We assess the performance of the proposed algorithm on CEC2017 benchmark functions with three dimensions of 30, 50, and 100. The experimental results verify the effectiveness of the proposed algorithm on the majority of the benchmark functions.

9:00 - 17:00 WedP3.14

Fault Diagnosis of Caster Ladle Turret Based on Fuzzy Decision, pp. 948-952.

Caigao Xiong — Hubei Business College
Dai Pan — Hubei Business College

The slewing bearing, as an important rotating part of the caster ladle turret, its security and stability of working is critical for normal operation of the ladle turret. The main damage forms of the slewing bearing were analyzed and the fault diagnosis method based on fuzzy decision was proposed. On the basis, an overall program of the caster ladle turret status monitoring and fault diagnosis system was designed. Comprehensive solutions for issues such as the monitoring physical quantities, measuring points arrangement, the data collection methods, the analysis methods, the overall design and function modules of the software system were presented. The system is stable to achieve the intended design goals. The research has a strong theoretical and practical significance for monitoring and fault diagnosis of the ladle turret slewing bearing.

9:00 - 17:00 WedP3.15

Algorithm for k-anonymity based on ball-tree and projection area density partition, pp. 966-969.

Cheng Chen — Jinan Univ.
Xiaoli Liu — Jinan Univ.
Linfeng Wei — Jinan Univ.
Longxin Lin — Jinan Univ.
Xiaofeng Wu — Guangzhou Sports Vocational & Tech. College

K-anonymity is a popular model used in microdata publishing to protect individual privacy. This paper introduces the idea of ball tree and projection area density partition into k-anonymity algorithm.The traditional kd-tree implements the division by forming a super-rectangular, but the super-rectangular has the area angle, so it cannot guarantee that the records on the corner are most similar to the records in this area. In this paper, the super-sphere formed by the ball-tree is used to address this problem. We adopt projection area density partition to increase the density of the resulting recorded points. We implement our algorithm with the Gotrack dataset and the Adult dataset in UCI. The experimentation shows that the k-anonymity algorithm based on ball-tree and projection area density partition, obtains more anonymous groups, and the generalization rate is lower. The smaller the K is, the more obvious the result advantage is. The result indicates that our algorithm can make data usability even higher.

9:00 - 17:00 WedP3.16

Credit Risk Prediction Based on Machine Learning Methods, pp. 1005-1007.

Yu Li — Zhuhai College of Jilin Univ.

Credit scoring which helps to evaluate the capability of repayment of customers is one of the most important issues for loan institutions. Due to the rapid development of machine learning techniques in computer science area and other related subjects, various classification methods have been proposed to facilitate the implementation of machine learning methods for characterizing the repayment behavior of customers. In this research, we use the XGBoost algorithm to identify the bad customers who do noe pay money back from the good customers. A comprehensive study is conducted to compare the performance of XGBoost algorithm with logistic regression. The results show that the XGBoost algorithm works much better.

9:00 - 17:00 WedP3.17

Research on Modify Protection of Metrology Electronic Certificate Based on Blockchain Technology, pp. 1014-1018.

Yangpeng Zhu Xi'an Shiyou Univ.
Jiabao He Xi'an Shiyou Univ.
Kun Yuan Xi'an Shiyou Univ.
Yanmei Yang Xi'an Shiyou Univ.

The metrological verification certificate is an important basis for the metrology instrument to be verified by the statutory verification agency. The verification result affects whether the measuring instrument can be used normally again. With the development of computer network technology, electric certification has been widely promoted and applied due to its low cost and easy to check characteristics. The authenticity of electric certification is the basis of practical application, how to ensure its uniqueness, integrity and Non-destructible metrology will have a significant impact on metrological verification. Blockchain technology uses a decentralized distributed network structure. Once the data information is added to the main chain through hash algorithm, Merkle tree structure, asymmetric key encryption technology and consensus mechanism verification, it will be saved and cannot be Make malicious modifying or deletion. On the basis of summarizing the blockchain anti-modifying technology, the article applies the principle and method of blockchain related technology to the feasibility of measuring electric certification to meet the requirements of ensuring the uniqueness and authenticity of electric certification.

9:00 - 17:00 WedP3.18

Real-time Entity Resolution by Multiple Indices, pp. 1057-1062.

Liang Zhu Hebei Univ.
Rundong Cui Hebei Univ.
Qin Ma Hebei Univ.
Weiyi Meng State Univ. of New York at Binghamton

Entity resolution (ER) is the process of extracting and matching records/tuples from one or more datasets that refer to the same real-world entity and merging the matching records into a tuple or a cluster. In this paper, we primarily focus on ER for datasets with text attributes. By creating different local indices on individual attributes and constructing the corresponding algorithm and ranking function for indices, we present an approach to resolve records involving duplicates, misspellings, or NULL text attributes for a dirty dataset. Extensive experiments are conducted to demonstrate the performances of our proposed approach.

9:00 - 17:00 WedP3.19

Control Researches on Nonlinear Systems for A Quadrotor UAV Helicopter Under Impact of Wind Disturbance Based on Method of Domination, pp. 1074-1079.

Lin Chai Southeast Univ.
Pan Wang Southeast Univ.
Shumin Fei Southeast Univ.

With the advantages of simple structure, high maneuverability and flexibility, the quadrotor Unmanned Aerial Vehicle (UAV) has been widely used not only in military but also in civil fields. However, it is a big challenge to design the underlying flight controller since the quadrotor has characteristics of nonlinearity, underactuated feature, strong coupling and sensitive to internal and external disturbances. In this paper, an underlying flight controller is designed based on the model of Bebop Drone and nonlinear domination approach.

9:00 - 17:00 WedP3.20

A Cost-Sensitive Feature Selection Method for High-Dimensional Data, pp. 1083-1088.

Chaojie An Xiamen Univ.
Qifeng Zhou Xiamen Univ.

With the increase of data dimension in many application fields, feature selection, as an essential step to avoid the curse of dimensionality and enhanced the generalization of the model, is attracting more and more research attention. However, most existing feature selection methods always assume the features have the same cost. These research efforts mainly focus on features' relevance to learning performance while neglecting the cost to obtain them. Feature cost is a crucial factor need to be considered in feature selection problem especially for the real world applications. For example, in the process of medical diagnosis, each feature may have a very different testing cost. To select low-cost subsets of informative features, in this paper, we propose a stratified random forest-based cost-sensitive feature selection method. Unlike commonly used two-step cost-sensitive feature selection approaches, in our model, the cost of features is incorporated into the construction process of the base decision tree, that is, the cost and the performance of each feature are optimized simultaneously. Moreover, we adopt a stratified sample method to enhance the performance of the feature subset for high-dimensional data. A series of experimental results show that compared with the state-of-the-art methods, the proposed approach can lower the cost of the selected feature subset while maintaining comparable learning performance.

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