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Part I Conference Schedule

Time: August 8-10, 2022
Location: Chengdu Xinliang Hotel
成都新良大酒店

Date	Time	Location: Lobby, 1st floor		
Aug. 8	14:00-17:00	Registration		
Date	**Time**	**Location: TBD**	**Location: TBD**	**Location: TBD**
Aug. 9	08:30-12:00	**Chemical Science** **Keynote Speech Session 1** **Dr. Jun Xu, Dr. Xinhua Liang, Prof. Ahmad Zuhairi Abdullah, Prof. Ebru YAŞA KAFKAS** **Chair: TBD** **Group Photo & Coffee Break: 09:50-10:10**	**Computer Science** **Keynote Speech Session 1** **Prof. Guofan Shao, Prof. Mahmoud Reza Delavar, Prof. Chinthaka Premachandra, Dr. Prem Kumar Singh** **Chair: TBD** **Group Photo & Coffee Break: 09:50-10:10**	**Medicine & Healthcare** **Keynote Speech Session 1** **Prof. Koichi Shimizu, Prof. Huiyu Zhou, Dr. Jun Hua, Dr. Giuseppe Floresta** **Chair: TBD** **Group Photo & Coffee Break: 09:50-10:10**
	12:00-13:30	**Lunch** TBD		
Date	**Time**	**Location: TBD**	**Location: TBD**	**Location: TBD**
Aug. 9	14:00-18:00	**Chemical Science** **Keynote Speech Session 2** **Prof. Chin-Kang Sha, Dr. Xiaoteng Liu, Prof. K. R. Desai, Dr. Bayram Gunduz, Dr. Angyang Yu** **Chair: TBD** **Group Photo & Coffee Break: 16:00-16:20**	**Computer Science** **Keynote Speech Session 2** **Prof. Dr. Long Li, Dr. R. A. Hamzah, Dr. Kim Phuc Tran, Prof. Krzysztof S. Kulpa, Prof. Soumya Banerjee** **Chair: Prof. Dr. Long Li** **Group Photo & Coffee Break: 16:00-16:20**	**Medicine & Healthcare** **Keynote Speech Session 2** **Dr. Mirza Muhammad Faran Ashraf Baig, Dr. KC Santosh, Prof. Anand Kar, Dr. Nurys B. Armas Rojas, Prof. Ming Chyu** **Chair: TBD** **Group Photo & Coffee Break: 16:00-16:20**
	18:00-19:30	**Dinner** TBD		
Date	**Time**	**Location: TBD**		**Location: TBD**
Aug. 10	08:30-12:00	**Chemical Science** **Keynote Speech Session 3 & Technical Session** **Dr. Vijay Devra** **Chair: Dr. Xiong Wang** **Group Photo & Coffee Break:**	**Computer Science** **Technical Session** **Chair: TBD** **Group Photo & Coffee Break:**	**Medicine & Healthcare** **Technical Session** **Chair: TBD** **Group Photo & Coffee Break:**

		09:50-10:10	**09:50-10:10**	**09:50-10:10**
	12:00-13:30	**Lunch** TBD		

Part II Keynote Speech

Chemical Science: Keynote Speech Session 1

Keynote Speech 1: Molecular design of dynamic covalently crosslinked polyurethanes and the application as functional materials

Speaker: Dr. Jun Xu, Tsinghua University, Beijing, China
Time: 08:30-09:10, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Dynamic covalent polymers have received extensive attention due to their unique self-healable and reprocessable properties. Researchers have introduced many types of dynamic covalent bonds into polymers, but the regulation of the same type of dynamic covalent bonds has not been adequately studied. We designed a new type of dynamic covalent bond, the phenol-carbamate bond in polyurethane, and systematically studied the molecular design strategy and the structure-property relationship of the dynamic covalent polyurethanes. The dissociative mechanism of dynamic covalent network rearrangement was clarified by means of stress relaxation and variable temperature FTIR. The prepared materials exhibited excellent self-healing and reprocessing properties. For molecular design, two methods were applied to regulate the dissociation kinetics and initial dissociation temperature of the phenol-carbamate dynamic network. One was to vary the substituent electron effect of phenolic compounds and the other was to change the chemical structure of diisocyanates. Furthermore, we synthesized high-strength, self-healing, surface-modifiable, and patternable polyurethane elastomers as polymer matrix for printing soft electronic circuit. We used dihydroxybenzophenone as a monomer to prepare the cross-linked polyurethane elastomer with both dynamic covalent bonds and UV-sensitive units. The obtained materials possessed tensile strength up to 20MPa and the elongation at break larger than 1000%. The material can be surface grafted with vinyl monomers to change surface hydrophilicity under short time UV irradiation or self-crosslinked under UV irradiation for 10 min. Application of the multi-functional polyurethane materials as a soft substrate for heat transfer printing of flexile electronics was demonstrated.

Keynote Speech 2: Highly Dispersed Metal Nanoparticle Catalysts Prepared by Atomic Layer Deposition [video]

Speaker: Dr. Xinhua Liang, Missouri University of Science and Technology, USA
Time: 09:10-09:50, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Heterogeneous catalysts enable many chemical transformations of fossil resources (natural gas, methane, liquid petroleum, coal, etc.) into useful products. Normally, heterogeneous catalysts consist of small metal particles dispersed on a high surface area porous oxide support. Atomic layer deposition (ALD) is a thin film growth technique based on sequential, self-limiting surface chemical reactions, and has focused principally on the formation of thin film oxides with precise atomic layer control. Recently, ALD has been used to prepare highly active, highly dispersed metal nanoparticles. In this presentation, I will introduce ALD chemistry, metal and bimetallic nanoparticles prepared by ALD, and examples of nanostructured catalysts prepared by ALD, such as thermally stable size-selective catalysts.

Keynote Speech 3: Role of pore geometry of $Ca_{1+x}Al_{1-x}La_xO_3$ composite catalyst supported on MCM-41 in selective glycerol etherification to polyglycerol [video]

Speaker: Prof. Ahmad Zuhairi Abdullah, School of Chemical Engineering, Universiti Sains Malaysia, Malaysia
Time: 10:10-10:50, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Glycerol is abundantly produced by oleochemical and biodiesel industries and its industrial uses are rather limited. Polyglycerol is one of the potential products of industrial importance but it’s selective production through catalytic means often subjects to a few drawbacks. A novel heterogeneous catalyst was prepared by means of a co-precipitation method and its activity in selective glycerol etherification was demonstrated. Lanthanum (La):calcium (Ca) ratio, temperature, and the duration of calcination positively influenced the conversion of glycerol. A regression model was established to predict the effect of calcination conditions and La:Ca ratio on glycerol conversion. After 8 h of reaction, a conversion of 81.6 % was achieved under atmospheric pressure for at 250 ° C, 3.5 wt. % of catalyst and with a La to Ca ratio of 1:2.7. The catalyst was subjected to a thermal treatment at 560 ° C for 4.5 h. The catalyst characterization revealed well-mixed oxides with desirable properties such as sufficient porosity and surface area. It also showed that the formation of the O – Ca – O functional group sitting on the

surface of the catalyst facilitated high glycerol conversion. The synthesized catalyst with excellent porosity and stability area was promising for glycerol etherification.

Keynote Speech 4: Strawberry Volatiles [video]

Speaker: Prof. Ebru YAŞA KAFKAS, University of Çukurova, Turkey
Time: 10:50-11:30, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Fruits produce a range of volatile compounds that make up their characteristic aromas and contribute to their enshuastic flavor. Esters, alcohols, aldehydes, ketones, lactones, terpenoids and apocarotenoids are known as main volatile groups. Fruit volatiles can be changed based on the genotyp, ripening stage, cultural applications and environmental conditions, postharvest management. Strawberries (Fragaria ×ananassa Duch.) have unique and highly desirable flavor and are one of the most popular berry fruits. Sugars, acids, and aroma volatiles contribute to the characteristic strawberry flavor, which is dependent on the proper balance of these chemical constituents. While sugars and acids are responsible for the sweetness and tartness of the fruit, aroma volatiles provide the unique, fruity flavors that characterize a fresh strawberry. In this paper, we review the composition of strawberry volatiles, identification and quantification methdologies and the factors affecting aroma profiles.

Keywords: Strawberry, volatiles, GC/MS.

Chemical Science: Keynote Speech Session 2

Keynote Speech 5: TBD

Speaker: Prof. Chin-Kang Sha, Department of Chemistry, National Tsing Hua University, Hsinchu
Time: 14:00-14:40, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 6: TBD

Speaker: Dr. Xiaoteng Liu, Northumbria University, UK
Time: 14:40-15:20, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 7:TBD

Speaker: Prof. K. R. Desai
Time: 15:20-16:00, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 8: TBD

Speaker: Dr. Bayram Gunduz
Time: 16:20-17:00, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 9: TBD

Speaker: Dr. Angyang Yu
Time: 17:00-17:40, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Chemical Science: Keynote Speech Session 3

Keynote Speech 10: TBD

Speaker: Dr. Vijay Devra
Time: 08:30-09:10, Wednesday Morning, August 10, 2022
Location: TBD

Abstract
TBD

Computer Science: Keynote Speech Session 1

Keynote Speech 1: The Right Tool for the Right Job: Map Accuracy vs Classification Efficacy

Speaker: Prof. Guofan Shao, Department of Forestry and Natural Resources, Purdue University, USA
Time: 08:30-09:10, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Image classification is one of the most challenging tasks in remote sensing applications. Its direct outcome is a thematic map. The quality of thematic maps matters because they are parts of decision making in downstream applications. Researchers have made incredible efforts in continuously advancing image classification techniques to increase the accuracy of classification outcome. However, existing accuracy measures have various problems and can mislead the evaluation of classifier's performance when imbalanced datasets are involved. There are two common misperceptions: accuracy rates are assumed to comparable across maps and they reflect the discriminative power of classifiers. This is particularly the case for classification with deep learning (DL) because imbalanced datasets tend to undermine the performance of DL models but favor some accuracy measures. Here we discuss and demonstrate the use of image classification efficacy (ICE) to strengthen the evaluation of image classification using DL in remote sensing. The introduction of ICE helps clarify the differences between map accuracy assessment and classifier performance evaluation. Such a differentiation is an important step toward improved research on classifier's evaluation and advancement.

Keynote Speech 2: Smart Spatial Data Fusion for Urban Growth Modeling

[video]

Speaker: Prof. Mahmoud Reza Delavar, University of Tehran, Iran
Time: 09:10-09:50, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 3: Enhanced Omnidirectional Image Generation for Robotics

[video]

Speaker: Prof. Chinthaka Premachandra, Shibaura Institute of Technology, Japan
Time: 10:10-10:50, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Due to the panoramic capturing ability, there are many potential applications for omnidirectional cameras, including robotic systems, intelligent transport systems, surveillance systems, aerial photography and so on. However, omnidirectional camera images generally have lower resolution than typical cameras, leading to difficulty in identifying objects farther from the camera. On the other hand, omnidirectional cameras have a fisheye lens on either side, so when mounting them on robots, drones, or automobiles, they must be mounted so that the fields of view of the fisheye lenses will not be obstructed. This keynote discusses solutions to above mentioned demerits of omnidirectional cameras.

Keynote Speech 4: Turiyam geometry for dealing the uncertainty in Non-Euclidean Data Sets [video]

Speaker: Dr. Prem Kumar Singh, Gandhi Institute of Technology and Management-Visakhapatnam, Andhra Pradesh, India
Time: 10:50-11:30, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Recently, the mathematics of Turiyam set is introduced for dealing the uncertainty in data sets beyond acceptation, rejection and uncertain parts. This set given a way to deal the data set with human cognition and its awareness rather than just via quantity representation. Due to which recently, mathematical algebra of Turiyam Modules, Rings, Matrices and Space is studied recently. In this process a problem is addressed while characterization of data sets in Turiyam geometry. It is indeed required to study Turiyam geometry and its dynamicity to understand the pattern in the given data sets. To achieve this goal, this talk will focus on discussing those non-Euclidean data sets which can be represented via Turiyam geometry. Some of the illustrative examples for the proposed method will be also discussed for better understanding.

Computer Science: Keynote Speech Session 2

Keynote Speech 5: Applying Remote Sensing Multitemporal Analysis with Caution

Speaker: Prof. Dr. Long Li, Department of Land Resources Management, China University of Mining and Technology, China
Time: 14:00-14:40, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 6: 3D Terrain Surface Reconstruction from Stereo Image using Deep Learning [video]

Speaker: Dr. Rostam Affendi Hamzah, Universiti Teknikal Malaysia Melaka, Malaysia
Time: 14:40-15:20, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
This study presents a new framework of stereo matching algorithm that can generate three-dimensional from stereo camera. A stereo matching process produces a disparity map which provides the depth information required in 3D reconstruction. This map consists of disparity values of two corresponding points. Furthermore, the accuracy of 3D reconstruction depends on how precise the disparity being estimated on each pixel location. To get a good 3D reconstruction result, the propose stereo matching algorithm must be strong against the radiometric differences and edge distortions. Hence, this work proposes a new stereo matching algorithm with high accuracy for 3D surface reconstruction. First stage, hybrid Convolutional Neural Network (CNN) with Gradient Matching (SG) is proposed which uses deep learning and magnitude differences. The CNN and gradient matching are strong against the radiometric distortions due to different characteristics of the input stereo cameras. Second stage, the Adaptive Support Weight (ASW) with iterative Guided Filter (ASW iGF) is proposed to improve the edges of object matching. The last stage, Joint Weighted Guided Filter (JWGF) is suggested to reduce the remaining noise on the disparity map. This map is used for 3D surface reconstruction. Based on the standard quantitative benchmarking stereo dataset, the proposed work in this article produces good results and performs much better compared with before the proposed framework. This new algorithm is also competitive with some established methods in the literature. Then from this accurate framework, the 3D surface

reconstruction is employed with the terrain or land images as an input using Point Cloud Library (PCL).

Keynote Speech 7: Machine Learning for Explainable Anomaly Detection in IoT systems: Methods, Applications, and Challenges [video]

Speaker: Dr. Kim Phuc Tran, the ENSAIT and the GEMTEX laboratory, University of Lille, France
Time: 15:20-16:00, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
The recent development of advanced technologies such as Smart Sensor Networks, the Internet of Things (IoT), and Artificial Intelligence (AI) drive continuous improvement, knowledge transfer, and data-driven decision-making in many fields. The problem of Anomaly Detection (AD) based decision-making support for the Industry 4.0 context is a major concern in a large number of studies. Anomaly Detection is a set of major techniques with an aim to detect rare events or observations that deviate from normal behavior. Applications of AD include intrusion detection in a computer network, spotting potential risk or medical problems in health data, and predictive maintenance. In this talk, I will present an overview of Anomaly Detection and the applications such as cybersecurity in IoT systems, production monitoring, predictive maintenance. I will present an overview of Explainable Anomaly Detection and the applications such as cybersecurity in IoT systems, production monitoring, predictive maintenance. I also discuss what challenges the current anomaly detection methods can address and envision this area from multiple different perspectives.

Keynote Speech 8: TBD [video]

Speaker: Prof. Krzysztof S. Kulpa, Warsaw University of Technology, Poland
Time: 16:20-17:00, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 9: TBD [video]

Speaker: Prof. Soumya Banerjee, Conservatoire Nationale des Arts et Metiers(CNAM), Paris, France
Time: 17:00-17:40, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Medicine & Healthcare: Keynote Speech Session 1

Keynote Speech 1: Noninvasive macroscopic 3D trans-body imaging with near-infrared light [video]

Speaker: Prof. Koichi Shimizu, Xidian University, China and Waseda University, Japan
Time: 08:30-09:10, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
X-ray, MRI and ultrasound have problems of ionized radiation, large-scale equipment and limited spatial resolution, respectively. The near-infrared (NIR) light can be the candidate of another modality for medical imaging. Its attenuation in animal tissue is relatively low among light wavelengths, and we can detect the NIR light through an animal body. However, because of the strong scattering in the tissue, it is difficult to get clear image of deep-seated structure in the tissue. Its practical applicability has been limited only to the subcutaneous structure in thin body parts. We have developed some techniques to suppress the scattering in turbid media, and attempted to use them for the imaging through animal body. The NIR imaging is radiation-free and can be implemented into a small and light instrument. This talk presents the techniques for three dimensional (3D) trans-body imaging, and the examples of their application to noninvasive imaging of macroscopic internal structure.

Keynote Speech 2: New artificial intelligence technologies in healthcare [video]

Speaker: Prof. Huiyu Zhou, School of Computing and Mathematical Sciences, University of Leicester, UK
Time: 09:10-09:50, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Artificial intelligence has significantly influenced the health sector for years by delivering novel assistive technologies from robotic surgery to versatile biosensors that enable remote diagnosis and efficient treatment. While the COVID-19 pandemic is devastating, the uses of AI in the healthcare sector are dramatically increasing and it is a critical time to look at its impact in different aspects. In this talk, I will introduce the application of new deep learning models in medical image understanding. Then, I will discuss Parkinson's disease (PD) whilst investigating the behaviour analysis of PD mice. I also present the use of machine learning technologies in sentiment analysis, followed by the discussion on several challenges.

Keywords: Artificial intelligence; healthcare; image segmentation; behaviour analysis; challenges

Keynote Speech 3: Dynamic imaging of CSF transportation in the perivascular space and cerebral lymphatic vessels [video]

Speaker: Dr. Jun Hua, Johns Hopkins School of Medicine, USA
Time: 10:10-10:50, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Cerebral lymphatic vessels have been identified in the dura mater alongside blood vessels in the brain. These small vessels are believed to be a critical component of the central nervous system (CNS) as a waste clearance pathway for the cerebrospinal fluid (CSF) and interstitial fluid (ISF), which may play a crucial role in many brain diseases. Non-invasive imaging techniques are very limited for the cerebral lymphatic vessels. Due to the small sizes of the lymphatic vessels, high spatial resolution is required, which leads to a temporal resolution of several minutes in most existing approaches. Such temporal resolution is usually not sufficient to detect the dynamic signal changes in the lymphatic vessels. In this talk, I will introduce a recently developed MRI sequence for the measurement of dynamic signal changes in the cerebral lymphatic vessels with a sub-millimeter spatial resolution, a temporal resolution of <10s, and whole brain coverage.

Keynote Speech 4: From Iron to Gallium a journey into hydroxypyridinones chemistry [video]

Speaker: Dr. Giuseppe Floresta, King's College London, UK
Time: 10:50-11:30, Tuesday Morning, August 9, 2022
Location: TBD

Abstract
Hydroxypyridinones are exceptional building blocks for the development of a variety of agents in the field of metal chelation. The pyridinone ring is easily synthesized and converted into tetra-, hexa- and octadentate chelators. Their ability to rapidly and efficiently bind hard metals in aqueous media has facilitated the development of several applications in both biological and medical contexts. In our research group our attention is recently focused on Hexadentate tris (3,4-hydroxypyridinone) ligands (THP). THP complex Fe^{3+} at very low iron concentrations and their high affinities for oxophilic trivalent metal ions have led to their development for new applications as bifunctional chelators for the radiometal gallium-68 (^{68}Ga). THP-peptide bioconjugates rapidly and quantitatively complex ^{68}Ga at room temperature, neutral pH,

and micromolar ligand concentrations, making them amenable to kit-based radiosynthesis of ^{68}Ga PET (positron emission tomography) radiopharmaceuticals. Several THP scaffolds have been produced over the years and most of them resulted as great candidates for further development in the field of PET imaging. In this keynote, some examples will be analysed from the design to the in vitro and in vivo application.

Medicine & Healthcare: Keynote Speech Session 2

Keynote Speech 5: Treatment of Wilms' nephroblastoma cancer cells via EGFR targeting of dactinomycin loaded DNA-nanowires [video]

Speaker: Dr. Mirza Muhammad Faran Ashraf Baig, The University of Hong Kong, China
Time: 14:00-14:40, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
Purpose
Dactinomycin (DCTM) is a highly cytotoxic hydrophobic drug requiring robust nanomaterials for uniformed water dispersion and safe delivery to tumor site avoiding exposure to healthy cells.
Methods
DNA triangulation produces sturdier two-dimensional nanostructures through the polymerization of DNA-triangles by sticky ends cohesion in the form of DNA-nanosheets. The curvature of the B-form (right twisted) DNA causes the coiling of the DNA-nanosheets into DNA-nanowires (D-NWs) structures. DNA-triangles scaffolded by the short circular templates (84-NT) are stiffer in topology giving rise to compact D-NWs for DCTM loading, and cellular delivery. The PAGE gel analysis was performed to assess the polymerization of the DNA-triangles to observe restricted electrophoretic mobility, and attainment of a single sharp band. The morphology and compactness of the D-NWs were confirmed by the AFM analysis and confocal imaging. Epidermal growth factor (EGF) functionalization of the D-NWs was performed through amide chemistry using amino-modified DNA strands reacting with the carboxylic group of EGF for EGFR targeting. EGFR is highly expressed on NB-OK-1 Wilms' tumor nephroblastoma cancer cells. DCTM loading onto D-NWs was carried out through intercalation between the base pairs of GC rich DNA duplex by physical mixing/incubation, and was confirmed through the UV peak shift analysis and confocal imaging. Cell internalizations and the cytotoxic effects were monitored via confocal imaging, MTT assay, and flow cytometry.
Results
AFM images of the synthesized D-NWs showed that polymerization of DNA-triangles was successful with the length ranging from 4 to 6 µm, and width ranging from 80 to 120 nm. EGF functionalization was confirmed through the confocal microscopy after labeling EGF with the FITC

hook conjugating dye. The slight UV shift (> 15 nm) confirmed DCTM loading onto D-NWs. Blank D-NWs showed biocompatibility to the cells at different (low to high) concentrations (10 µM to 640 µM). MTT assay revealed that DCTM loaded D-NWs showed a dose-dependent (0.25 – 128 nM) decrease in cell viability.

Conclusion

EGF functionalized D-NWs effectively targeted the EGFR rich NB-OK-1 cancer cells compared to the control HEK293/D75 cells lacking EGFR (receptors). By these results, we can expect similar site-specific targeted treatment if administered systemically.

Keywords: Dactinomycin (DCTM); DNA triangular tiles; DNA-nanosheets; DNA-nanowires (D-NWs)

Keynote Speech 6: TBD [video]

Speaker: Dr. KC Santosh, Department of Computer Science, University of South Dakota, USA
Time: 14:40-15:20, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract

TBD

Keynote Speech 7: TBD [video]

Speaker: Prof. Anand Kar
Time: 15:20-16:00, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract

TBD

Keynote Speech 8: TBD [video]

Speaker: Dr. Nurys B. Armas Rojas
Time: 16:20-17:00, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Keynote Speech 9: TBD [video]

Speaker: Prof. Ming Chyu, Texas Tech University, USA
Time: 17:00-17:40, Tuesday Afternoon, August 9, 2022
Location: TBD

Abstract
TBD

Part III Technical Sessions

Chemical Science: Technical Session

Session Chair: Dr. Xiong Wang

Location: TBD 08:30-12:00, August 10, 2022

Time	Paper Title	Author	Affiliation
Oral	Highly efficient Porous Organic Polymer/Inorganic Nanoparticles based metallocene catalysts	Dr. Xiong Wang	Lanzhou Petrochemical Research Center, Petrochemical Research Institute, PetroChina, Lanzhou, China
Oral	Ionic Liquid-Modified Porous Organic Polymers as Efficient Metallocene Catalyst Supports	Wenqian Kang	Lanzhou Petrochemical Research Center, Petrochemical Research Institute, PetroChina, Lanzhou, China
Oral	Preparation of axially grafted temperature-responsive chiral salen Mn^{III} and application in asymmetric epoxidation of olefins in water *	Dr. Yao-yao Zhang	School of Chemistry and Materials Science, Hubei Engineering University, Hubei, China
Poster	Preparation of nonionic softener based on wool wax and its utilization in functionalization of textile fabrics	Prof. Hosam El-Sayed	National Research Centre, Eygpt

Computer Science: Technical Session

Session Chair: TBD
Location: TBD 08:30-12:00, August 10, 2022

Time	Paper Title	Author	Affiliation
Oral	DENSITY ADAPTIVE PLANE SEGMENTATION FROM LONG-RANGE TERRESTRIAL LASER SCANNING DATA	Aobo An	School of Civil Engineering, Chongqing Jiaotong University, Chongqing, China
Oral	MARKER-FREE REGISTRATION OF TERRESTRIAL LASER SCANNING DATA IN FOREST WITH STEM POSITION TRIPLET MATCHING USING KD-TREE	Zehui Jin	School of Civil Engineering, Chongqing Jiaotong University, Chongqing, China
Oral	Research on terrestrial laser scanning point cloud for stem extraction based on point feature and Mean Shift clustering	Xiangjiang Liu	School of Civil Engineering, Chongqing Jiaotong University, Chongqing, China
Oral	Vital sign signal extraction based on mmWave radar	Fuchuan Du	Shanghai Jiaotong University, Shanghai, China
Oral	Classification of terrestrial point cloud considering point density and unknown angular resolution	Xinyi Zhang	School of Civil Engineering, Chongqing Jiaotong University, Chongqing, China
Oral	COMPARISON OF CLASSIFICATION PERFORMANCE BETWEEN RANDLANET AND RF UNDER FOREST POINT CLOUD	Long Xiao	School of Civil Engineering, Chongqing Jiaotong University, Chongqing, China
Oral	Construction Method of RhombicTriacontahedron Discrete Global Grid System	Xiaoyu Liang	Information Engineering University, Zhengzhou, China
Oral	Design of on-orbit radiation calibration scheme of optical remote sensing systems	Xiaoman Li	Beijing Institute of Space Mechanics & Electricity, Beijing, China

Oral	Deep Learning for Oilseed Rape Extraction from Sentinel-2 Image	Wei Xia	East China Normal University, Shanghai, China
Oral	Impacts of microphysics schemes on downscaling air temperature and precipitation using WRF model in complex terrain	Qin Lang	Southwest University, Chongqing, China
Poster	CSNetwork: An anomaly prediction target optimization method for building change detection	Yi Zhang	Department of Geographic Information System, Central South University, Changsha, China

Medicine & Healthcare: Technical Session

Session Chair: TBD

Location: TBD 08:30-12:00, August 10, 2022

Time	Paper Title	Author	Affiliation
Oral	The development of community-based family healthcare in China: A cross-sectional study in Beijing, China	Xiao Wang	Peking University School of Nursing, Beijing, China
Oral	Telehealth for peritoneal dialysis: A literature review	Mingli Zhu	Beijing Tsinghua Changgung Hospital, Beijing, China

Part IV Technical Session Abstracts

Chemical Science

ID: ICC2022_20000

Title: Highly efficient Porous Organic Polymer/Inorganic Nanoparticles based metallocene catalysts

Name: Xiong Wang

Affiliation: Lanzhou Petrochemical Research Center, Petrochemical Research Institute, PetroChina, Lanzhou, China

Email: wangxiong1@petrochina.com.cn

Abstract

The preparation of organic/inorganic hybrid materials has been proven to be an effective method to overcome the drawbacks of organic or inorganic materials. In this work, porous organic polymer/inorganic nanoparticles POP/NPs hybrid materials by in situ radical polymerization was synthesized for metallocene catalyst support, and the prepared POP/NPs (POP/MMT and POP/TiO_2) hybrid supports obtained excellent particle flowability with tunnable bulk density (0.20-0.40 cm^3/g) and specific surface area (100-350 m^2/g) suitable for polyolefin catalysts. N_2 sorption porosity, TGA, IR, XRD, SEM characterization were conducted to evaluate the POP/MMT and POP/TiO_2 hybrid supports, and the results showed that the MMT sheets and TiO_2 nanoparticles could be well-dispersed in the POP matrix. When 80% DVB was used, and when DVB/HEMA with 3:1 molar ratio was added, the prepared hybrid supports gained excellent particle flowability and single peak of particle size distribution. Ethylene polymerization results exhibited that the POP/NP supported metallocene catalysts could obtain better polymerization performance than the inorganic materials or the silica gel supported catalysts. The prepared POP/NPs catalysts show no obvious Zr^+ active sites decay during the ethylene polymerization, and gain stable polymerization kinetics in 80 ^oC. Furthermore, the pore structure played a significant effect on the molecular weight and molecular weight distribution by nano-confined polymerization, and larger molecular chains could be produced on the POP/NPs supported catalysts with smaller nanopore size.

Keywords: Porous organic polymer; nano particles; metallocene catalyst; ethylene polymerization

References:

[1] Heurtefeu, B.; Bouilhac, C.; Cloutet, É.; Taton, D.; Deffieux, A.; Cramail, H. Polymer support of “single-site” catalysts for heterogeneous olefin polymerization. Prog. Polym. Sci. 2011, 36, 89– 126.

[2] Wang, X.; Kang, W.; Gao, L.; Li G.; Chen, X.; Guo, Y. Highly flowable nano TiO2/porous organic polymer (POP) supports for efficient metallocene catalysts. Nanomaterials 2021, 11, 60.

[3] Wang, X.; Kang,W.; Li, G.; Zhang, P.; Jia, H.; Gao, D. Porous organic polymer/MMT hybrid supports for efficient metallocene catalysts. J. Mater. Sci. 2021, 56, 19253–19266.

ID: ICC2022_20001

Title: Ionic Liquid-Modified Porous Organic Polymers as Efficient Metallocene Catalyst Supports

Name: Wenqian Kang

Affiliation: Lanzhou Petrochemical Research Center, Petrochemical Research Institute, PetroChina, Lanzhou, China

Email: kangwenqian@petrochina.com.cn

Abstract

Porous organic polymers (POPs) are widely used in various areas such as adsorption, separation and catalysis. In the present work, ionic liquid-modified porous organic polymers (IL-POPs) synthesized by dispersion polymerization were applied to immobilize metallocene catalysts for olefin polymerization. The

prepared IL-POPs were characterized by Fourier transform infrared spectrometer (FT-IR), nitrogen sorption porosimetry, X-ray photoelectron spectroscopy (XPS), thermal gravimetric analysis (TGA), inductively coupled plasma atomic emission spectrometer (ICP) and scanning electron microscope (SEM) analysis. The IL-POPs obtained pores with surface specific area (SSA) ranging from 16.9 m^2/g to 561.8 m^2/g, and total pore volume (TPV) ranging from 0.08 cm^3/g to 0.71 cm3/g. The supported catalysts Zr/MAO@IL-POPs exhibit great activity (3700 kg PE/mol•Zr•bar•h) in ethylene polymerization, and the GPC-IR results show that the polyethylene has narrow molecular weight distribution (2.2 to 2.8). The DSC results show that the melting point of prepared polyethylene was as high as 138 ^oC, and the TREF analysis results indicate that they have similar chemical composition distribution with elution temperature at 100.5-100.7 ^oC.

Keywords: ionic liquid; porous organic polymer (POP); metallocene catalyst; ethylene polymerization; heterogeneous polymerization

ID: ICC2022_20002

Title: Preparation of axially grafted temperature-responsive chiral salen Mn^{III} and application in asymmetric epoxidation of olefins in water *

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Abstract

A series of temperature-responsive polymers (poly N-isopropylacrylamide-co-*N,N*- dimethylacrylamide, PNxDy) were prepared by using N-isopropylacrylamide (NIPAAm) and *N,N*-dimethylacrylamide (DMAM) as reaction monomers, azobisisobutyronitrile as chain initiator, and mercaptoethylamine hydrochlorides as chain transfer agents. Then, a novel thermoresponsive surfactant-type chiral salen Mn^{III} catalyst **PNxDyMn** were developed by axially grafting "smart" polymer (PNxDy) onto the metal center of a neat chiral salen Mn^{III} complex. The temperature-sensitivity, structure and morphology of the polymers were studied through a series of characterizations, and it was found that these temperature-responsive chiral polymers can efficiently catalyze the asymmetric epoxidation of olefins in pure water. Only 0.5 mol% of **$PN_{75}D_5Mn$** was sufficient to exhibit extremely high activity (conversion>99 %) with up to 76 % enantioselectivity and TOF (396/h) for a substrate of indene in water. The conversion rate of the substrate styrene was as high as 99% in 5 min, and the TOF value reached 2376/h. Characterization and experiments proved that **PNxDyMn** can self-assemble into nanoreactors for the asymmetric epoxidation of olefin in water, leading to an acceleration of reaction and causing selective effects. After reaction, the **PNxDyMn** exhibited hydrophobic properties upon heating above its LCST, and precipitated from the aqueous system for recovery. It can be recycled and reused for seven times without significant loss of activity, and no organic solvents were required for the reaction and separation process.

Keywords: Axial-grafting, Temperature-responsive, Chiral salen Mn^{III} complex, Asymmetric epoxidation of olefin in water, Recycle and reuse

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Computer Science

ID: AIR2022_20000

Title: Vital sign signal extraction based on mmWave radar *

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Abstract

This research develops an algorithm for health monitoring and uses the Infineon BGT60TR13C shield 60GHz radar to build a set of software and hardware demonstration platforms for algorithm verification. The algorithm can monitor the position, breathing, heartbeat and other information of the elderly in real time, which is used to judge the health status of the elderly and improve the convenience for early warning and rescue of abnormal situations in time. However, limited by the transmission power of this radar and the number of transmitting and receiving antennas, the current detection range of the algorithm is relatively small, and the ability to distinguish between multiple persons is limited. This problem can be optimized by replacing other types of radars in the future.

Keywords: millimeter-wave radar, FMCW, HR and RR detection, elderly health, real-time monitoring

ID: ICRSTA2022_20000

Title: Research on terrestrial laser scanning point cloud for stem extraction based on point feature and Mean Shift clustering

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Abstract

Objective: The automatic detection of tree stems can be realized with the terrestrial laser scanning in forest environment, which can greatly reduce the degree of user interaction. However, because of the common problems such as the difference of point cloud density and the shadowing effect of understory, it is not only difficult to identify the stem in a wide range of research areas but also the overall detection accuracy obtained is low. Therefore, a proposed method of stem detection based on Mean Shift clustering by using single-scan TLS data.

Method: In this method, the ground points first are separated by Cloth Simulation Filter (CSF) for the ground model establishment. Then, we constructed the point cloud features for non-ground points by adaptive KNN and extracted the stem points based on Random Forest (RF). After the classification results of stem points are obtained, the Mean Shift clustering based on density is used to replace the commonly used distance clustering algorithm for single stem extraction. Finally, the sliced point cloud are fitted by RANSAC cylinder, and the intersection of the cylinder axis direction with the ground model is taken as the stem position, so as to analyze and evaluate the stem detection results.

Result: Taking a campus forest of a university and a natural forest as the research area, the stem detection accuracy based on Mean Shift clustering and Euclidean clustering is compared and analyzed. The results show that after introducing mean shift clustering, 672 trees can be correctly detected from all 728 reference trees in two different scenes. The precision and recall of the stem detection after introducing Mean Shift clustering were 90.57% and 92.31% respectively, which are 5.98% and 4.81% higher than that of Euclidean clustering. In addition, the validity and accuracy of Mean Shift clustering in individual tree extraction are verified and analyzed by single tree clustering experiment.

Conclusion: The stem detection method based on single point feature and Mean Shift can improve the accuracy of single tree detection to a certain extent, reduce the generation of non-stem clusters in the process of individual tree clustering, and provide ground reference data for forest inventory, and enrich

the means of the stem detection.

Keywords: Terrestrial laser scanning (TLS), feature extraction, Mean Shift clustering, RANSAC cylinder fitting, individual tree position

ID: ICRSTA2022_20001

Title: Density Adaptive Plane Segmentation From Long-range Terrestrial Laser Scanning Data

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Abstract

Plane segmentation is a commonly used approach that extracts detailed building information from point cloud. However, the change of density is not obvious for most of the current research data, and the objects with different densities are difficult to be classified especially for long-range TLS data which scanning distance exceeds 500m, while neighborhood radius is the key factor to solve this problem. And there are already some methods to determine the optimal neighborhood radius in a fixed range based on the Shannon entropy. When these methods are applied in scenes with high density changes, the large range is divided into several small ranges and the invalid radius range will be considered, resulting in reduced efficiency. In this article, an approach for density adaptive plane segmentation is presented. Firstly, compared with methods based on fixed radius range, dynamic neighborhood radius is selected before plane segmentation to ensure that the objects with different densities can be identified and the dimension feature of each point can be computed, while this paper uses three parameters (sampling interval, distance, multiple) to ensure the dynamic neighborhood radius, where the multiple can be selected by internal and external indexes. Moreover, the proportion of planar points in each cluster is counted to extract the buildings, an improved growing rule based on dimension feature is applied to segment the buildings into planes. The experimental results show that the proposed method can efficiently extract planes from long range TLS data, the precision reaches 95%, the recall reaches 92%.

Index Terms — long-range TLS data, dynamic neighborhood radius, dimension feature, plane segmentation, region growing

ID: ICRSTA2022_20002

Title: Classification of terrestrial point cloud considering point density and unknown angular resolution

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Abstract

Point cloud classification is a key step in 3D scene analysis. Density change is one of the factors that affect the accuracy of terrestrial laser point cloud classification. Angular resolution is a common parameter for point cloud density adaptive processing. In order to solve the problems of unknown angular resolution and point density variation of terrestrial laser point cloud, a classification method considering density change and unknown angular resolution is proposed in this paper. To improve the traditional point density calculation method, the angular resolution estimation method of random neighborhood analysis is presented. Then we combine angular resolution to propose a grid feature extraction method which takes density variation into account. The proposed method is tested on three datasets. The result shows that the error of our method is smaller than 0.002 ° , which can accurately estimate the angular resolution. And compared with traditional density feature, our method can improve the overall accuracy of point cloud classification, and it also performs well in the extraction of cars and pole. The method can accurately estimate the angle resolution, classify the point cloud with higher accuracy, which can provide a reference for density adaptive processing of large-scale terrestrial laser point clouds.

Keywords: terrestrial laser scanning; classification; point density; angular resolution; relative projection density

ID: ICRSTA2022_20003

Title: MARKER-FREE REGISTRATION OF TERRESTRIAL LASER SCANNING DATA IN FOREST WITH STEM POSITION TRIPLET MATCHING USING KD-TREE

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Abstract

Marker-free registration methods for terrestrial laser scanning data are gradually being proposed to replace the placement of manual connection points to improve work efficiency in the forest environment. In this paper, an improved method is proposed for the complexity and time consuming of the existing mark-free registration methods. In our method, only the stem positions are needed. By using the edge lengths and eigenvalues that calculated based on each set of tie point triplets as feature information for triplet matching and KD-Tree to speed up the triplets matching process to find the best transformation parameters. Through the comparison experiments, the results showed that the improved method can achieve the purpose of registration.

Index Terms — Terrestrial laser scanning, forestry, registration, KD-Tree

ID: ICRSTA2022_20004

Title: COMPARISON OF CLASSIFICATION PERFORMANCE BETWEEN RANDLANET AND RF UNDER FOREST POINT CLOUD

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Abstract

In forestry, the Terrestrial Laser Scanning(TLS) technology is used to obtain 3D points generally. And the classification of the points is necessary, as the 3D laser scanner cannot obtain the semantic information of each point directly and the forest investigation requires point semantic attributes. This paper compares traditional machine learning based on Random Forest classifier and newly deep learning based on RandLA-Net neural network, so as to clarify the performance of two different methods for large scene points classification. The experimental results indicated that the RandLA-Net neural network has better performance than the RF framework, and its m_IoU reached 69.4%.

Index Terms— forestry, deep learning, random forest, classification, forest point cloud

ID: ICRSTA2022_20005

Title: Construction Method of RhombicTriacontahedron Discrete Global Grid System

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Abstract

The discrete global grid system(DGGS) is a new global-oriented multi-resolution remote sensing earth observation data modeling and organization solution, and related research has attracted extensive attention in the academic community. The icosahedron is considered to be an ideal choice for constructing a DGGS and is widely used. However, the inherent structural defects and the resulting inability to meet the precise carrying problem of remote sensing big data urgently require a new construction scheme to solve. In this paper, the rhombictriacontahedron is used to construct a DGGS, and a mathematical model of equal-area mapping between the rhombictriacontahedron surface and the spherical surface is proposed, and a multi-resolution hexagonal

grid is designed by combining the rhombictriacontahedron structure and the characteristics of four-hole hexagon subdivision net generation algorithm. Compared with the scheme based on the Snyder icosahedron equal-area grid system, the mean and standard deviation of the angle deformation of this scheme on the equal-area mapping scheme are reduced by about 42% and 31%., at the same level, the number of grids is more and the distribution is more uniform, the length deviation and angle deviation are reduced by about 44% and 29%, the standard deviation of length deviation and angle deviation and the standard deviation of compactness are reduced by about 33%, 25% and 39%. The reduction of the length deformation and angle deformation of the rhombictriacontahedron scheme can help to establish a high-precision model of remote sensing image data organization, realize the accurate bearing of remote sensing big data, and provide a good model foundation for the combination of global discrete grid and high-performance computing.

Keywords: Discrete global grid systems; rhombictriacontahedron; equal-area mapping; hexagonal grid generation

ID: ICRSTA2022_20006

Title: Deep Learning for Oilseed Rape Extraction from Sentinel-2 Image

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Abstract

Oilseed rape is one of three major oil crops in the world with the highest oil production efficiency, and also it has the largest sown area and the extensive distribution in China. Therefore, timely and accurate mapping and monitoring of oilseed rape is of great significance for agricultural production management and national food security. In the past, the accuracy and efficiency of oilseed rape mapping have been often limited by poor data availability and impractical classification methods. Until recent years, deep learning technology has been widely used in crop extraction based on high-resolution remote sensing imagery. In this paper, the Chongming Island of Shanghai is selected as the study area. In the full bloom period of oilseed rape, the spectral and index characteristics of Sentinel-2 images are used to construct a sample dataset. An improved U-Net convolutional neural network is employed to extract planting area of oilseed rape. To evaluate the effectiveness of the proposed method, we compare the extracted results with those of traditional machine learning methods such as Random Forests (RF) and Support Vector Machines (SVM). The results show that the overall accuracy of oilseed rape extracted by this method is of more than 90%, which is better than that of other methods. The research presents that this paper provides an innovative, intelligent and efficient method for the accurate extraction of crop planting area at the regional scale by using medium and high-resolution remote sensing images and deep learning technology.

Keywords: Oilseed rape, Extraction, Sentinel-2, U-Net

ID: ICRSTA2022_20008

Title: Design of on-orbit radiation calibration scheme of optical remote sensing systems

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Abstract

For quantitative application of space remote sensing, strict radiation calibration before launch, todetermine the initial spectral radiation response characteristics of remote sensing, remote sensingin orbit flight, due to space particle radiation, pollution, components aging will cause thedegradation of remote sensing performance, to change the spectral radiation response

characteristics, therefore, regularly for radiation calibration, meet the requirements of long-term quantitative application of remote sensing data. Visible light (VIS) and near-infrared(NIR) observation spectrum segments mainly refer to the 0.4-1.7um spectrum segment. When the earth observation within the range, the radiation received by the remote sensing device is greatly affected by the sun. For the remote sensing device with large field of view greater than 100degrees, multi-perspective calibration is required to reduce the calibration error. The paperintroduces the design of visible and Nlinfrared optical remote sensing, and the calibration accuracy was analyzed.

ID: ICRSTA2022_20010

Title: CSNetwork: An anomaly prediction target optimization method for building change detection

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Abstract

In recent years, building change detection in remote sensing images based on deep learning has received increasing attention from researchers and has made great progress. However, building change detection in remote sensing images is still full of challenges: on the one hand, some backgrounds in remote sensing images have similarity with building spectra; on the other hand, building changes are sparse, and the category imbalance between positive and negative samples easily leads to the model's insufficient ability to separate foreground-background features. These problems lead to two adverse situations: 1) messy and broken close false positives appear, resulting in pseudo-variable spots with abnormal area, 2) Honeycomb or mesh-like cavities in normal building change spots, some areas inside the building are missed and topological abnormalities appear. Currently, no effective theoretical method has emerged to deal with the above-mentioned area anomalies and topological anomalies in the change detection prediction. To solve these problems, we propose a new CSNetwork framework to enhance the ability of the network to cope with the anomalous areas in the prediction results. It cascades a classification network with spatial attention after siamese networks or semantic segmentation networks for change detection. In this case, the segmentation network focuses on the global area containing the foreground-background and performs the initial change detection. The classification network focuses only on the regions in the vicinity of the foreground and performs secondary determination of anomalous targets. Based on a plain baseline (FC-EF, FC-Siam-conc), the CSNetwork framework effectively reduces the appearance of pseudo-variable and outperforms several most advanced building change detection methods on the LEVIR-CD dataset, reaching the state of the art.

Keywords: Remote Sensing, Change Detection, Abnormal optimization

ID: ICRSTA2022_20200

Title: Impacts of microphysics schemes on downscaling air temperature and precipitation using WRF model in complex terrain

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Abstract

In areas comprising complex terrain, high-spatiotemporal-resolution air temperature and precipitation data are crucial for forcing land surface, hydrological, and ecological models; however, existing datasets usually have a coarse spatial or temporal resolution. Dynamic downscaling using the Weather Research and Forecasting (WRF) Model is an efficient way to obtain air temperature and precipitation with high spatiotemporal resolution over complex terrain. Faced with the abundant physical parameterizations in the WRF model, the selection of suitable microphysics schemes is critical. Using the WRF Model, we performed sensitivity studies on

different microphysics schemes (including Lin, New Thompson, NSSL 2-moment 4-ice, WDM7, and WSM7) by downscaling ERA5 data to one-kilometer resolution over Chongqing, an area of complex terrain in southwest China. We found that all schemes can adequately describe the distribution of air temperature, but perform unsatisfactory for precipitation over complex terrain. The correlation coefficients were 0.96 to 0.97 and 0.18 to 0.48, for air temperature and precipitation, respectively, while the average root mean square errors (RMSE) were 2.15 to 2.37 ºC and 9.52 to 11.34 mm day − 1, respectively. For precipitation, the probability of detection was 0.29 to 0.44, and the false alarm ratio was 0.71 to 0.73. Validations based on in-situ observations show that the WSM7 scheme has the best performance, with the smallest RMSE (2.15 ºC for air temperature and 9.52 mm day−1 for precipitation). These findings can act as a reference for further downscaling work using the WRF Model in this unique region.

Medicine & Healthcare

ID: ICNH2022_20000

Title: Telehealth for peritoneal dialysis: A literature review

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Abstract

Telehealth is a broad term that includes videoconferencing, exchange of medical information via electronic communications, remote patient monitoring, population health management, and mobile health technologies. For patients with chronic kidney disease who have progressed to end-stage renal disease, peritoneal dialysis (PD) has many advantages such as stable hemodynamics, no need for anticoagulation, protection of residual renal function, and home operation. It can also be used for multidisciplinary diseases treatment, provide patients with greater independence and improve their quality of life, but the lack of more frequent monitoring may affect the results and reduce the patient's widespread adoption of this model. How to improve the management of peritoneal dialysis patients at home, provide medical supervision, and reduce the occurrence of complications has attracted the attention of clinical medical staff. Telehealth has played an active role in the management of chronic diseases, promoting closer follow-up between medical staff and patients, helping patients identify problems early, reducing the burden of patients' self-care, and improving patient outcomes. It is gradually being promoted. This paper analyzes and summarizes the related research on telehealth benefits and barriers, and the application of telehealth in peritoneal dialysis patients, in order to provide reference for the management of home peritoneal dialysis patients.

Keywords: telehealth; telemedicine; remote management; peritoneal dialysis

ID: ICNH2022_20001

Title: The development of community-based family healthcare in China: A cross-sectional study in Beijing, China

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Abstract

In China, the homecare health services provided by community health centers have not been used efficiently. This study is aiming to investigate under the context of the COVID-19 pandemic, the current situation of community residents' willingness and demand for home healthcare services and to explore the factors influencing them.

A cross-sectional study was conducted in March-April 2022 in the Beijing area, using a structured questionnaire to interview and survey 491 residents who had used community health services in Beijing, China. Cardinality test analysis and multivariate logistic regression models were used to identify factors influencing residents' intention and need scores for home healthcare services.

The number of people with a supportive attitude towards family healthcare was 316 (64.36%), neutral attitude: 164 (33.40%), opposing attitude: 11 (2.24%). The average number of unmet healthcare needs was 3.291, 13 types of it, among which the most three needs were chronic disease prevention (58.33%), health status assessment (52.24%), diagnosis and treatment of daily diseases (47.97%). Results of univariate analysis showed that age ($p=0.012$), residential status ($p=0.022$), annual income ($p<0.001$), and number of underlying diseases ($p<0.001$) were the influencing factors for community residents' willingness to access home healthcare services. The results of multivariate logistic regression analysis showed that residential status (OR=2.170), education (OR=7.668), and income level (OR=3.680) were the main influencing factors of demand.

The results of the study indicate that community residents present a high level of support for family healthcare services, and have a wide variety and number of unmet healthcare service needs. Further measures are needed to increase the promotion of community-based homecare health services, increase support for home health care, and increase utilization of home health services, thereby, addressing the unmet health needs of community residents. It is necessary to build up a perfect community service system, to respond to the greater challenges of the future for the primary health system.

Keywords: family healthcare, community health services, cross-sectional study

Part V Instructions for Presentations

Oral Presentation

Devices Provided by the Conference Organizing Committee:

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

Materials Provided by the Presenters:

- PowerPoint or PDF files

Duration of each Presentation:

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

Poster Presentation

Materials Provided by the Conference Organizing Committee:

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

Materials Provided by the Presenters:

- Home-made Posters

Requirement for the Posters:

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

Part VI Hotel Information

About Hotel

Located in the urban central business zone and close to Chunxi Road - a time-honored street, **Chengdu Xinliang Hotel (成都新良大酒店)** is within touching distance of the fashion shopping landmark - IFS (international financial centre) and Taikoo Li, and within walking distance of Tianfu Square - the traffic hub in the city centre. It is a great place for you to start traveling in Chengdu because of its exceptional geographical location. The Hotel is designed out of inspiration from the Ba-Shu culture featured in leisurely life, integrating the elegant modern style, which makes it just look like an oasis hidden in the prosperous city. The individualized service full of warmth makes you feel at home and enables you to enjoy all the comforts. Totally 345 quiet, comfortable and modern guest rooms full of abundant Shu charm and complete facilities afford you a wonderful picture of the magnificent landscape of Chunxi Road.

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