Technical Program

Wednesday, 14 April

08:30-09:00 Opening Ceremony

Prof. **Lin Wang**, General Co-Chair for the Welcome

Prof. **Xinghao Ding,** TPC Co-Chair for the Academic affairs

Prof. **Ryuji Kohno**, Steering Committee Co-Chair & General Co-Chair

09:05-10:05(UTC+9: 10:05-11:05) Keynote I: Virtual Clinic for Cyber-Physical Medical Healthcare against Pandemic and Daily Life with Standard WBAN, 5G, and AI Universal Platform

Prof. **Ryuji Kohno**, Yokohama National University

10:10-12:10 Communications Systems for Medical Applications

Session Chairs: A/Prof. Lin Zhang; *Sun Yat-sen University*, China

1. 10:11-10:30: A Spectrum-Efficient M-ary Correlation Delay Shift Keying Scheme for Non-Coherent Chaotic Communications

Xiangming Cai; *Xiamen University*, China

Weikai Xu; *Xiamen University*, China

Shaohua Hong; *Xiamen University*, China

Lin Wang; *Xiamen University*, China

2. 10:31-10:50: Energy Efficient Power Allocation for OFDM-NOMA Visible Light Communication Systems with Statistical Channel State Information

Lin Zhang; *Sun Yat-sen University*, China

Furong Fang; *Sun Yat-sen University*, China

Zhiqiang Wu; *Wright State University*, USA

3. 10:51-11:10: Adaptive Noise Canceller Design Based on Chaotic Simulated Annealing Particle Swarm Optimization Algorithm

Zhang Jie; *Chengdu University of Information Technology*, China

Pengcheng Wen; *Chengdu University of Information Technology*, China

Yan Shen; *Chengdu University of Information Technology*, China

4. 11:11-11:30: A Novel Sparse Measurement Matrix for CS-DCSK UWB System

Qingzhi Wang; *Xiamen University*, China

Guanpeng Fu; *Xiamen University*, China

Shaohua Hong; *Xiamen University*, China

Weikai Xu; *Xiamen University*, China

Lin Wang; *Xiamen University*, China

5. 11:31-11:50: Design and Performance Analysis of Multicarrier M-Ary Differential Chaos Shift Keying System

Tingting Huang; *Huaqiao University*, China

Wenyu Chen; *Huaqiao University*, China

Dongliang Yang; *Huaqiao University*, China

Lin Wang; *Xiamen University*, China

Weikai Xu; *Xiamen University*, China

6. 11:51-12:10: Performance of M-ary DCSK Modulation in SWIPT Cooperative System with Decoding Cost

Yu Zhang; *Guangdong University of Technology*, China

Yi Fang; *Guangdong University of Technology*, China

Guofa Cai; *Guangdong University of Technology*, China

Pingping Chen; *Fuzhou University*, China

14:30-15:30(UTC+9: 15:30-16:30) Keynote II: Implantable Brain Machine Interfaces

Prof. **Masayuki Hirata**, Osaka University

15:35-18:15 Body Area Network (BAN) Technologies (PHY, MAC,

Protocols)

Session Chairs: Prof. Pingping Chen; *Fuzhou University*, China

1. 15:36-15:55: Performance Analysis of Buffer-Aided Relaying Implant WBAN

   Yanqiu Xiao; *Guangdong University of Technology*, China

   Guofa Cai; *Guangdong University of Technology*, China

   Yang Song; *Nanyang Technological University*, Singapore

   Guoen Cai; *Fujian Medical University Union Hospital*, China

   Yi Fang; *Guangdong University of Technology*, China

   Guojun Han; *Guangdong University of Technology*, China

2. 15:56-16:15: An Improved Successive Cancellation List Flip Decoder for Polar Codes Based on Key Sets

   Jingyun Bao; *Sun Yat-sen University*, China

   Shunjie Lin; *Xinhua Cellege of Sun Yat-sen University*, China

   Xingcheng Liu; *Sun Yat-sen University & Xinhua College of SYSU*, China

3. 16:16-16:35: Construction of Quasi-Cyclic Low-Density Parity-Check Codes Based on Quadratic Residue Codes

   Yong Li; *Chongqing University*, China

   Hao Yan; *University of Michigan*, USA

   Rui Liu; *Chongqing University*, China

   Zhen Luo; *Chongqing University of Posts and Telecommunications*, China

   Huihui Wu; *McGill University*, Canada

4. 16:36-16:55: A Construction Method of Doped Low-Density Parity-Check Codes Based on Quadratic Residue Codes

   Yong Li; *Chongqing University*, China

   Xiang Huang; *Chongqing University of Posts and Telecommunications*, China

   Chuang Zhou; *Chongqing University of Posts and Telecommunications*, China

   Zhen Luo; *Hong Kong University of Science and Technology*, Hong Kong

   Huihui Wu; *McGill University*, Canada

5. 16:56-17:15: An Decoding Parameter Optimization Method for LDPC Codes in 5G NR Based on 3D EXIT Chart

Wenyi Cheng; *Beijing University of Posts and Telecommunications*, China

Chao Dong; *Beijing University of Posts and Telecommunications*, China

Kai Niu; *Beijing University of Posts and Telecommunications*, China

Zhengzhen Zhang; *Beijing Union University*, China

6. 17:16-17:35: Power Allocation of Two-User Downlink Channel Decoding

Cong Wang; *Fuzhou University*, China

Pengfei Chen; *Fuzhou University*, China

Pingping Chen; *Fuzhou University*, China

Yi Fang; *Guangdong University of Technology*, China

7. 17:36-17:55: Dynamic Error Recovery Mechanism over Wireless Network

Ran Li; *Fuzhou University*, China

Pingping Chen; *Fuzhou University*, China

Feng Chen; *Fuzhou University*, China

8. 17: 56-18:15: Performance of Deep Learning for Multiple Antennas Physical Layer Network Coding

Jinghua Liu; *Fuzhou University*, China

Pingping Chen; *Fuzhou University*, China

Feng Chen; *Fuzhou University*, China

Thursday 15 April

8:30-9:30 Keynote III: Deep Learning for Motif Mining in Biological Sequences and Beyond

Prof. **De-Shuang Huang**, Tongji University

9:35-11:55 AI/Data Analytics for Medicine, Healthcare and Welfare

Session Chairs: A/Prof. Shihui Guo; *Xiamen University*, China

1. 9:36-9:55(UTC+9: 10:36-10:55): Stress and Comfort Estimation of Patients Listening a Music while Rehabilitation Training by Machine Learning with Pre-processed Electrocardiogram

Yuko Okazaki; *Yokohama National University*, Japan

Yoshitomo Sakuma; *Yokohama National University*, Japan

Takumi Kobayashi; *Yokohama National University*, Japan

Chika Sugimoto; *Yokohama National University*, Japan

Ryuji Kohno; *Yokohama National University*, Japan

2. 9:56-10:15: Semi-Supervised Learning Based on Competitive Prototype Seeds Selection for Phonation Detection of Patients with Parkinson's Disease

Yunfeng Wu; *Xiamen University*, China

Yixuan Liu; *Xiamen University*, China

YangCan Hou; *Xiamen University*, China

Xi Chen; *Xiamen University*, China

Tingxuan Gao; *Xiamen University*, China

3. 10:16-10:35: SVM-Based Gait Analysis and Classification for Patients with Parkinson's Disease

Yuncheng Zheng; *Guangdong University of Technology*, China

Yanhong Weng; *Fujian Medical University Union Hospital*, China

Xiaoli Yang; *Guangdong University of Technology*, China

Guofa Cai; *Guangdong University of Technology*, China

Guoen Cai; *Fujian Medical University Union Hospital*, China

Yang Song; *Nanyang Technological University*, Singapore

4. 10:36-10:55: A Multi-Modal Joint Voice Parts Division Method Based on Deep Learning

Lingjun Chen; *Xiamen University*, China

Caidan Zhao; *Xiamen University*, China

Yunyi Liu; *Xiamen University*, China

Peiyun Zhuang; *Xiamen University*, China

5. 10:56-11:15: Multi-Agent Reinforcement Learning Based Channel Access Scheme for Underwater Optical Wireless Communication Networks

Zenghui Zhang; *Sun Yat-sen University*, China

Lin Zhang; *Sun Yat-sen University*, China

Zuwei Chen; *Sun Yat-sen University*, China

6. 11:16-11:35: Mahalanobis Distance-Based Adjustable Classifier Models for Diagnosing Heart Diseases

Shuping Sun; *Nanyang Institute of Technology*, China

Tingting Huang; *Nanyang Institute of Technology*, China

Biqiang Zhang; *Nanyang Institute of Technology*, China

Peiguang He; *Nanyang Institute of Technology*, China

Long Yan; *Shenzhen University*, China

Jiale Zhang; *Nanyang Institute of Technology*, China

7. 11:36-11:55: Correcting Corrupted Labels Using Mode Dropping of ACGAN

Jizhong Su; *Xiamen University*, China

Xing Gao; *Xiamen University*, China

Yipeng Qin; *Cardiff University*, United Kingdom

Shihui Guo; *Xiamen University*, China

14:30-15:30(UTC+2: 8:30-9:30) Keynote IV: Blockchain Technology for Health: Current and Future Trend between Industry and Academia

Prof. **Lorenzo Mucchi**, University of Florence and Prof. **Duccio Micela**, JSB Solutions

15:35-18:15 Medical Imaging and Patient Diagnostic Systems, Privacy and Security issues, and Body Area Network (BAN) Technologies

Session Chairs: A/Prof. Sicong Liu; *Xiamen University*, China

1. 15:36-15:55(UTC+3: 10:36-10:55): Propagation Study of UWB Capsule Endoscope with Multiple on-Body Antennas

Mariella Särestöniemi; *University of Oulu*, Finland

Carlos Pomalaza Raez; *Purdue University*, USA

Chaïmaâ Kissi; *Ibn Tofail University*, Morocco

Jari Iinatti; *University of Oulu*, Finland

2. 15:56-16:15(UTC+2: 9:56-10:15): Modelling the Fluorescence Optical Imaging Sequence Data of Rheumatic Hands with a 1D Hydrodynamic Flow Model

Stefan Kupper; *Wildau Technical University*, Germany

Richard Fiebelkorn; *Wildau Technical University*, Germany

Jörn Berger; Xiralite *GmbH*, Germany

Egbert Gedat; *Wildau Technical University*, Germany

3. 16:16-16:35: Multiple Geometric Surfaces Detection in Geometric Coordination Registration for Implant Surgery Virtual Planning and Assessment

Zhi-Jie Wu; *Guangdong University of Technology*, China

Tai-Chiu Hsung; *Chu Hai College of Higher Education*, Hong Kong;

Wing-Kuen Ling; *Guangdong University of Technology*, China

Cai-Yun Heng; *The University of Hong Kong*, Hong Kong

Walter Yu-Hang Lam; *The University of Hong Kong*, Hong Kong

Yu Pan; *The University of Hong Kong*, Hong Kong

4. 16:36-16:55: Automatic Site-Specific Multiple Level Gum Disease Detection Based on Deep Neural Network

Guan-Hua Li; *Guangdong University of Technology*, China;

Tai-Chiu Hsung; *Chu Hai College of Higher Education*, Hong Kong

Wing-Kuen Ling; *Guangzhou*, China

Walter Yu-Hang Lam; *The University of Hong Kong*, Hong Kong

George Pelekos; *The University of Hong Kong*, Hong Kong

Colman McGrath; *The University of Hong Kong*, Hong Kong

5. 16:56-17:15: A Decomposition-Based Network for Non-Uniform Illuminated Retinal Image Enhancement

Lujian Ye; *University of Science and Technology of China*, China

Xueyang Fu; *University of Science and Technology of China*, China

Aiping Liu; *University of Science and Technology of China*, China

Zheng-Jun Zha; *University of Science and Technology of China*, China

6. 17:16-17:35: Sparse Learning Based Implantable Medical Device Transmission against Eavesdropping

Tiankuo Wei; *Xiamen University*, China

Sicong Liu; *Xiamen University*, China

7. 17:36-17:55: Privacy Protection and Secure Transmission of Smart Meter Data

Shangqian Li; *Southwest University*, China

Xiaofeng Liao; *Chongqing University*, China

Jiahui Wu; *Southwest University*, China

Lijiao Zhu; *Southwest University*, China

Yulong Wang; *Southwest University*, China

8. 17: 56-18:15: A Novel Watermarking Mechanism for Deep Learning Models Based on Chaotic Boundaries

Zijie Huang; *Xiamen University*, China

Yingqian Zhang; *Xiamen University Tan Kah Kee College*, China

Yiran Jia; *Xiamen University*, China

Friday 16 April

8:30-9:30(UTC-5: Thursday 15 April 21:30-22:30) Keynote V: Molecular Communication Theory in Living Substrates for Future Medical Applications

Prof. **Massimiliano Pierobon**, University of Nebraska-Lincoln

9:35-11:55 Wearable and Implantable Devices, Pervasive Health Care and Patient Monitoring

Session Chairs: A/Prof. Zhong Ren; *Zhejiang University*, China

1. 9:36-9:55(UTC+9: 10:36-10:55): Design and Implementation of Injection Data Preprocessing & Monitoring System Based on Node-RED

Jaeen Lee; Sungkyunkwan University, Korea

Jaehyung Lee; Sungkyunkwan University, Korea

Jongpil Jeong; Sungkyunkwan University, Korea

2. 9:56-10:15(UTC+9: 10:56-11:15): Heat Stress Risk Estimation for Workers from Wearable Sensor Data and Lifestyle Information

Mami Saito; *Toshiba Corporation*, Japan

Takashi Sudo; *Toshiba Corporation*, Japan

Yasuhiro Kanishima; *Toshiba Corporation*, Japan

3. 10:16-10:35: A Modified Two-Dimension EEMD Method for Breathing and Heart Rates Monitoring via Through-Wall IR-UWB Radar

Tuo Zhou; *Guangdong University of Technology*, China

Guofa Cai; *Guangdong University of Technology*, China

Mangui Lin; *Guangdong University of Technology*, China

Guoen Cai; *Fujian Medical University Union Hospital*, China

Yang Song; *Nanyang Technological University*, Singapore

Yun Xu; *Guangdong University of Technology*, China

Xiang Zhou; *Hohai University*, China

4. 10:36-10:55: IDIgles: 3D-Printed Customized Goggles Based on Scanned Faces

Gucai Zhu; *Zhejiang University*, China

Lingye Wang; *Zhejiang University*, China

Zhong Ren; *Zhejiang University*, China

Yanlin Weng; *Zhejiang University*, China

Kun Zhou; *Zhejiang University*, China

5. 10:56-11:15: An Ac-Dc Interface Circuit for Harvesting Energy from Multiple Low-Voltage Piezoelectric Inputs

Jiahuan Wang; *Ningbo University*, China

Yin-Shui Xia; *Ningbo University*, China

6. 11:16-11:35: Wearable Devices Acquired ECG Signals Detection Method Using 1D Convolutional Neural Network

Yi Hui; *Harbin Institute of Technology*, China

Zhendong Yin; *Harbin Institute of Technology*, China

Mingyang Wu; *Harbin Institute of Technology*, China

Dasen Li; *Harbin Institute of Technology*, China

7. 11:36-11:55: Wearable Sweat Glucose Detection System Based on Cloud Platform

ZhiJun Xu; *Xiamen University*, China

Hezhi Lin; *Xiamen University*, China

Yong Chen; *Xiamen University*, China

XiaoTian Liu; *Xiamen University*, China

Zhiyuan Shi; *Xiamen University*, China

Lianfen Huang; *Xiamen University*, China

14:30-15:30 Keynote VI: Computational Nanobiosensing Biosensing by Learning

Prof. **Yifan Chen**, University of Electronic Science and Technology of China

15:35-17:35 Other Topics

Session Chairs: A/Prof. Xuechen Chen; *Central South University*, China

1. 15:36-15:55: Texture Blending for Photorealistic Composition on Mobile AR Platform

Guilin Li; *Xiamen University*, China

Pan Chen; *Xiamen University*, China

Shihui Guo; *Xiamen University*, China

2. 15:56-16:15: Blind Recognition Algorithm for Scrambled Channel Encoder

Based on the Features of Signal Matrix and Layered Neural Network

Wang Zhongfang; *Chinese Academy of Sciences*, China

Zhai Liuqun; *Chinese Academy of Sciences*, China

Wei Dong; *Chinese Academy of Sciences*, China

3. 16:16-16:35: Wiener Filter Aided Second-Order Cyclostationary Feature Detection of Mixed Signals for Higher Recognition Precision

Junyi Wu; *Sun Yat-sen University*, China

Haotian Zhang; *Sun Yat-sen University*, China

Lin Zhang; *Sun Yat-sen University*, China

Zhiqiang Wu; *Wright State University*, USA

4. 16:36-16:55: Compressed Sensing Based Multi-Hop Data Routing in 3D Underwater Wireless Sensor Networks

Xuechen Chen; *Central South University*, China

Wenjun Xiong; *Sun Yat-Sen University*, China

5. 15:56-17:15: A Multiple Sequences Spread-Spectrum System with In-phase/Quadrature Index Modulation for Underwater Acoustic Communications

Lingmiao Quan; *Xiamen University*, China

Weikai Xu; *Xiamen University*, China

Deqing Wang; *Xiamen University*, China

Lin Wang; *Xiamen University*, China

6. 17:16-17:35: RSS Fingerprinting Based Multi-User Outdoor Localization Using Reconfigurable Intelligent Surfaces

Haobo Zhang; *Peking University*, China

Hongliang Zhang; *Princeton University*, USA

Boya Di; *Imperial College London*, United Kingdom

Kaigui Bian; *Peking University*, China

Zhu Han; *University of Houston*, USA

Chenren Xu; *Peking University*, China

Daqing Zhang; *Peking University*, China

Lingyang Song; *Peking University*, China

17:36-18:15 Awards and Closing Ceremony (UTC+3: 12:36-13:15 UTC+9: 18:36-19:15)

Prof. **Lin Wang**, General Co-Chair for Best Paper Awards

Prof. **Ryuji Kohno**, Steering Committee Co-Chair & General Co-Chair for the Service Awards of ISMICT 2021

Prof. **Jari Iinatti**, Steering Committee Co-Chair & General Co-Chair for the Service Awards of ISMICT 2021

Prof. **Matti Hamalainen**, Steering Committee Co-Chair & TPC Co-Chair for the Announce of ISMICT 2022