

TECHNICAL PROGRAM

Monday March 21

Technical Session 1:

BAN Technology: PHY and MAC Protocols

Monday, March 21 (10:30-12:30), Room: Odeum A/B

End-to-End Power Optimization in Non-homogenous Relay Environment for Wireless Body Area Networks (WBANs)

Dan Liu, (College of Information Engineering, Dalian Ocean University (DLOU), P.R. China), Yishuang Geng, and Kaveh Pahlavan, (Center of Wireless Information Network Studies (CWINS), Worcester Polytechnic Institute (WPI), USA)

Evaluation of Multiple Coexisting Body Area Networks Based on Realistic On-Body and Body-to-Body Channel Models

Mickael Maman, Francesco Mani, Benoit Denis, and Raffaele D'Errico, (CEA-LETI, Minatec Campus, France)

QoS-Aware Superframe Management Scheme Based on IEEE 802.15.6

Tomohiro Fukuya, and Ryuji Kohno, (Graduate School of Engineering Yokohama National University, Japan)

An Adaptive Error Control Scheme Considering Various Channel Conditions and QoS in Medical and Non-Medical Data for WBAN

Takahiro Goto, Kento Takabayashi, and Ryuji Kohno (Graduate School of Engineering Yokohama National University, Japan)

A Study on Optimizing Energy Detection for UWB-IR Receiver

Rintaro Ogiwara, Akira Nakamura, (Tokyo University of Science, Japan), Kohei Ohno, (Meiji University, Japan), and Makoto Itami, (Division of Advanced Communication Researches, RIST, TUS, Japan)

Technical Session 2:

Medicao BAN Applications and Services

Monday, March 21 (10:30-12:30), Room: Hagglund

A Virtual Vital Signs Sensor "MIRUWS" for Visualization of Healthy to Illness Transition (HIT)

Shigenobu Minami, Miki Haseyama, (Graduate School of Information Science and Technology Hokkaido University, Japan), Hirokazu Tanaka, (Information Sciences and Graduate School of Information Sciences, Hiroshima City University, Japan), Toru Takahashi, (NeutureNetworks Co., Japan), and Tatsuya Komori, (Toshiba Digital Media Engineering Co., Japan)

Human Motion Identification Using Functional Near-Infrared Spectroscopy and Smartwatch

Amir Mohammad Amiri, Mohammadreza Abtahi, (Department of Electrical, Computer, & Biomedical Engineering, University of Rhode Island, USA), Cara Nunez, and Kunal Mankodiya, (Department of Electrical, Computer, & Biomedical Engineering, University of Rhode Island, USA)

AirSniffer: A Smartphone-Based Sensor System for Body Area Climate and Air Quality Monitoring

Jeffrey P. Smith, and Xinrong Li, (Department of Electrical Engineering, University of North Texas, USA)

Evaluation of IR-UWB BAN for Certification based on Regulatory Science

Keiko Sameshima, and Ryuji Kohno, (Graduate School of Engineering, Yokohama National University, Japan)

Technical Session 3:

Antennas and Radio Propagation for Wireless BAN

Monday, March 21 (14:00-15:20), Room: Odeum A/B

Design and Development of a 3D Folded Slot Antenna for Body-Worn Wireless Devices

Trang Thai, James Sabatini, and S.M. Shajedul Hasan, (Electrical Technologies & Systems, GE Global Research, USA)

Human Tissue Type and Volume Effect on the On-Body UWB Antenna Matchings

Timo Kumpuniemi, Matti Hamalainen, Kamyä Yekeh Yazdandoost, and Jari Iinatti (Centre for Wireless Communications, University of Oulu, Finland)

Evaluation of Ground Loop Through the Floor in Human Body Communication

Ken Sasaki, Dairoku Muramatsu, Naruto Arai, (Graduate School of Frontier Sciences, The University of Tokyo, Japan), and Fukuro Koshiji, (General Education and Research Center, Tokyo Polytechnic University, Japan)

Bit-Error-Rate OTA Testing of BAN Antennas Based on Shadowing-Fading Hybrid Effects

Kun Li, Keisuke Murata, Kazuhiro Honda, and Koichi Ogawa, (Graduate School of Engineering, Toyama University, Japan)

TECHNICAL PROGRAM

Monday March 21

Tuesday March 22

**Technical Session 4:
Rehabilitation and Activity Monitoring**
Monday, March 21 (14:00-15:20), Room: Hagglund

Challenges in Wireless Networking for Real-Time Vital Sensing from Persons in Exercises

Shinsuke Hara, (Graduate School of Engineering, Osaka City University, Japan), Hiroyuki Yomo, (Graduate School of Engineering Science, Kansai University, Japan), and Takashi Kawabata, (Graduate School of Health and Well-being, Kansai University, Japan)

Towards Sedentary Lifestyle Prevention: An Autoregressive Model for Predicting Sedentary Behaviors

Qian He, and Emmanuel O. Agu, (Department of Computer Science, Worcester Polytechnic Institute, USA)

Experimental Study of an Optical Wireless Physical Activity Monitoring System

C.Le Bas, L.Chevalier, P.Toumieux, S. Sahuguede, and A. Julien-Vergonjanne, (University of Limoges/XLIM/Labex SigmaLim, France)

Elderly Person Monitoring in Day Care Center using Bluetooth Low Energy

Kiyoaki Komai, Manato Fujimoto, Yutaka Arakawa, Hirohiko Suwa, Yukitoshi Kashimoto, and Keiichi Yasumoto, (Graduate School of Information Science, Nara Institute of Science and Technology, Japan)

**Technical Session 5:
Wireless Capsule Endoscopy I**
Tuesday, March 22 (15:00-16:00), Room: Odeum A/B

In-Body Ranging for Ultra-Wide Band Wireless Capsule Endoscopy Using A Neural Network Architecture

Muzaffer Kanaan, and Memduh Suveren, (Erciyes University, Faculty of Engineering, Department of Mechatronics Engineering, Turkey)

An Adaptive Localization Technique for Wireless Capsule Endoscopy

Hamed Farhadi, (Chalmers University of Technology, Sweden), Javid Atai, (The University of Sydney, Australia), Mikael Skoglund, (KTH Royal Institute of Technology, Sweden), Esmail S. Nadimi, (University of Southern Denmark, Denmark), Kaveh Pahlavan, (Worcester Polytechnic Institute, USA), and Vahid Tarokh, (Harvard University, USA)

Using Magnetic Resonance Wireless Power Transfer to Operate a Scalpel on a Prototype of a Robotic Therapeutic Endoscope

Hidetoshi Ohta, (Department of Gastroenterology, Sapporo Orthopaedics and Cardiovascular Hospital, Japan)

**Technical Session 6:
Wireless Capsule Endoscopy II**
Tuesday, March 22 (16:30-17:50), Room: Odeum A/B

Adaptive Magnetic Sensing Based Wireless Capsule Localization

Ilknur Umay, and Baris Fidan, (University of Waterloo, Canada)

An Energy Efficient Communication Technique for Medical Implants/Micro Robots

Nima N. Moghadam, (ACCESS Linnaeus Center, Royal Institute of Technology (KTH), Sweden), Hamed Farhadi, (Department of Signals and Systems, Chalmers University of Technology Gothenburg, Sweden), and Mats Bengtsson, (ACCESS Linnaeus Center, Royal Institute of Technology (KTH), Sweden)

OFDMA-based High Resolution Sensor Node ToA Estimation in Non-Homogenous Medium of Human Body

Mohsen Jamalabdollahi, and Seyed (Reza) Zekavat, (Department of Electrical and Computer Engineering Michigan Technological University, USA)

Performance Evaluation on WCE Localization Using GA-Based Three-Dimensional Electromagnetic Imaging

Taiki Iida, Daisuke Anzai, and Jianqing Wang, (Graduate School of Engineering, Nagoya Institute of Technology, Japan)

IEEE ISMICT 2016 – WORCESTER/BOSTON

International Symposium on Medical Information and Communication Technology

TECHNICAL PROGRAM

Wednesday March 23

Technical Session 7: Medical Imaging and Patient Diagnostic Systems

Wednesday, March 23 (9:00-10:00),
Room: Odeum A/B

Technology for Multispectral Scanning, Detection and Imaging for Medical Diagnosis

Al Messano, and Mandeep Singh, (Integral ElectroMagnetronic Technologies LLC, (IEMT), USA)

Cardiac MRI Compressed Sensing Image Reconstruction with a Graphics Processing Unit

Majid Sabbagh, (Electrical and Computer Engineering Department, Northeastern University, USA), Martin Uecker, (Institute for Diagnostic and Interventional Radiology, University Medical Center Gottingen, Germany), Andrew J. Powell, (Department of Cardiology, Boston Children's Hospital, USA), Miriam Leeser, (Electrical and Computer Engineering Department, Northeastern University, USA), and Mehdi H. Moghari, (Department of Cardiology, Boston Children's Hospital, USA)

Smartphone-Based Biosensing Platform Evolution: Implementation of Electrochemical Analysis Capabilities

Francois Patou, Maria Dimaki, Winnie E. Svendsen, (Department of Micro and Nanotechnology, Technology University of Denmark, Denmark), Claus Kjægaard, (Department of Electrical Engineering, Technology University of Denmark, Denmark), and Jan Madsen, (Department of Applied Mathematics and Computer Science, Technology University of Denmark, Denmark)

Technical Session 8: Medical Signal Processing

Wednesday, March 23 (9:00-10:00), Room: Hagglund

On-line EEG Denoising Using Correlated Sparse Recovery

Manish Gupta, (Division of Sleep and Circadian Disorders, Departments of Medicine and Neurology, Brigham and Women's Hospital, USA), Scott A. Beckett, (Division of Sleep and Circadian Disorders, Departments of Medicine and Neurology, Brigham and Women's Hospital, USA), and Elizabeth B. Klerman, (Division of Sleep and Circadian Disorders, Departments of Medicine and Neurology, Brigham and Women's Hospital, USA)

A Robust ECG Steganography Method

S. Edward Jero, and Palaniappan Ramu, (Department of Engineering Design, Indian Institute of Technology Madras, India)

VO2 Estimation using 6-axis Motion Sensing Data

Masato Miyatake, Naoteru Nakamura, Takashi Nagata, Akira Yuuki, Hiroyuki Yomo (Graduate School of Engineering Science, Kansai University, Japan), Takashi Kawabata (Graduate School of Health and Well-being, Kansai University, Japan), and Shinsuke Hara (Graduate School of Engineering, Osaka City University, Japan)

Technical Session 9: Pervasive Health Care and Patient Monitoring

Wednesday, March 23 (10:30-11:30),
Room: Odeum A/B

Emotional Reactivity Monitoring Using Electrodermal Activity Analysis In Individuals With Suicidal Behaviors

Amir Mohammad Amiri, Mohammadreza Abtahi, Anna Rabasco, (University of Rhode Island, USA), Michael Armev, (University of Brown, USA), and Kunal Mankodiya, (University of Rhode Island, USA)

UWB Gesture Detection for Visually Impaired Remote Control

Yuzhang Zang, Kaveh Pahlavan, Yang Zheng, and Le Wang, (Center of Wireless Information Network Studies (CWINS) Worcester Polytechnic Institute (WPI), USA)

Evaluation of LoRa LPWAN Technology for Remote Health and Wellbeing Monitoring

Juha Petajajarvi, Konstantin Mikhaylov, Matti Hamalainen, and Jari Iinatti, (Centre for Wireless Communications, Department of Communications Engineering, University of Oulu, Finland)

Technical Session 10: Privacy and Security Issues

Wednesday, March 23 (11:30-12:30),
Room: Odeum A/B

Watermark-Based Secure Communications in Safety-Related Scenarios

Simone Soderi, (Centre for Wireless Communications, University of Oulu, Finland), Lorenzo Mucchi, (Department of Information Engineering, University of Florence, Italy), Matti Hamalainen, (Centre for Wireless Communications, University of Oulu, Finland), Alessandro Piva, (Department of Information Engineering, University of Florence, Italy), and Jari Iinatti, (Centre for Wireless Communications, University of Oulu, Finland)

Secure Access Delegation of Encrypted Medical Information

Arnab Deb Gupta, Yuriy Polyakov, and Kurt Rohloff, (College of Computing Sciences, New Jersey Institute of Technology, USA)

TECHNICAL PROGRAM

Wednesday March 23

Technical Session 11: Indoor Patient Localization

Wednesday, March 23 (10:30-12:30),
Room: Hagglund

Software Emulation of TOA Based Ranging with UWB Creeping Wave around Human Body

Xiaoxi Li, Fen Qin, Mingda Zhou, and Kaveh Pahlavan, (Center for
Wireless Information Network Studies, Worcester Polytechnic
Institute, USA)

On the Selection of Protocol and Parameters for UWB- based Wireless Indoors Localization

Konstantin Mikhaylov, Antti Tikanmaki, Juha Petajajarvi, Matti
Hamalainen, (Centre for Wireless Communications, Department
of Computer Science and Engineering, University of Oulu,
Finland), and Ruji Kohno, (Division of Physics, Electrical and
Computer Engineering, Yokohama National University, Japan)

Analyzing the Effect of Human Body and Metallic Objects for Indoor Geolocation

Fardad Askarzadeh, Kaveh Pahlavan, Sergey Makarov, (Center for
Wireless Information Network Studies, Worcester Polytechnic
Institute, USA), Yunxing Ye (BroadCom Limited Ltd.), and Umair
Khan, (Intel Corporation)

A Barometer-Assisted Method to Evaluate 3D Patient Geolocation inside Hospital

Julang Ying, (Center of Wireless Information Network Studies,
ECE Department, Worcester Polytechnic Institute, USA)
Chao Ren, (Azimuth Systems Inc.), and Kaveh Pahlavan, (Center
of Wireless Information Network Studies, ECE Department,
Worcester Polytechnic Institute, USA)

Using iBeacon for Newborns Localization in Hospitals

Zhouchi Li, Yang Yang, and Kaveh Pahlavan, Center for Wireless
Information Network Studies (CWINS), Worcester Polytechnic
Institute (WPI), USA