

## Program Overview

### 13 July 2018

gSIC Competition - Design	09:00-16:30	Guangda No. 7, 2/F, SEEC Hotel
gSIC Competition - Technology	09:00-17:30	Guangda No. 6, 2/F, SEEC Hotel
gSIC Exhibition Preparation	15:00-17:00	SEEC Exhibition Hall

### 14 July 2018

Opening Ceremony	08:30-09:00	Grand Ballroom, 2/F, SEEC Hotel
Plenary Lecture	09:00-12:00	Grand Ballroom, 2/F, SEEC Hotel

#### Sessions:

Assistive Technology for Visual Disabilities	13:30-17:00	Guangda No. 8, 2/F, SEEC Hotel
Brain-Computer Interface and Rehabilitation	13:30-17:15	Guangda No. 9, 2/F, SEEC Hotel
Intelligent Neurological Rehabilitation	13:30-17:30	Guangda No. 10, 2/F, SEEC Hotel
HCR Symposium	13:30-17:10	Guangda No. 1, 2/F, SEEC Hotel
"Smart Rehab Helps Healthy China" International Rehabilitation Forum	13:30-16:30	Grand Ballroom, 2/F, SEEC Hotel
gSIC Exhibition	09:00-17:30	SEEC Exhibition Hall
Poster Presentation	09:00-17:30	SEEC Exhibition Hall
Gala Dinner	18:00-20:00	Grand Ballroom, 2/F, SEEC Hotel
Inauguration Ceremony of Rehabilitation Robotics Alliance	20:00-22:00	Guangda No. 6, 2/F, SEEC Hotel

### 15 July 2018

Speech and Cognitive Rehabilitation Technology	08:30-12:05	Guangda No. 6, 2/F, SEEC Hotel
International Forum on Industry Development of Assistive Products	08:30-17:00	Guangda No. 8, 2/F, SEEC Hotel
Assistive Technology for Spinal Cord Injury	08:30-11:50	Guangda No. 9, 2/F, SEEC Hotel
Rehabilitation and Assistive Devices for Ankle-Foot	08:30-17:10	Guangda No.11, 2/F, SEEC Hotel
Intelligent Assistive Devices	13:30-17:00	Guangda No. 6, 2/F, SEEC Hotel
Assistive Technology for Pediatric Rehabilitation	13:30-17:45	Guangda No. 7, 2/F, SEEC Hotel
EMG Technology	13:30-17:15	Guangda No. 9, 2/F, SEEC Hotel

Prosthetic and Orthotic Technology	13:30-17:15	Guangda No. 10, 2/F, SEEC Hotel
HCR Symposium	08:30-17:50	Guangda No. 1, 2/F, SEEC Hotel
gSIC Exhibition	09:00-17:30	SEEC Exhibition Hall
Poster Presentation	09:00-17:30	SEEC Exhibition Hall
Launching Ceremony of Rehabilitation Product Manual	12:30-13:00	SEEC Exhibition Hall
gSIC Awarding for Excellent Participants	15:15-15:45	SEEC Exhibition Hall
HCR VIP Dinner	18:00-22:00	Gather at hotel lobby

### 16 July 2018

Neuro-Rehabilitation Robotics and Human-robot Interaction	08:30-12:00	Guangda No. 6, 2/F, SEEC Hotel
Intelligent Assistive Technology & Neuro-Rehabilitation Robotics and Human-robot Interaction	08:30-11:50	Guangda No. 7, 2/F, SEEC Hotel
HCR Symposium	08:30-12:10	Guangda No. 1, 2/F, SEEC Hotel
<b>Workshop:</b> Smartphones and people with disabilities: the power and technological promise	09:00-10:40	Guangda No. 11, 2/F, SEEC Hotel
CREATe Asia Meeting	09:30-12:00	Training 3, 2/F, SEEC Hotel
gSIC Exhibition	09:00-12:00	SEEC Exhibition Hall
Poster Presentation	09:00-12:00	SEEC Exhibition Hall
Technical Tour	13:00-17:30	Gather at hotel lobby

## 14 July 2018, AM

**Opening** Grand Ballroom, 2/F, SEEC Hotel

**Chairs: Hongliu YU, Baolin LIU**

08:00-08:30 Admission  
08:30-09:00 Opening Ceremony

## 14 July 2018, AM

**Plenary Lecture** Grand Ballroom, 2/F, SEEC Hotel

**Chairs: Jianwei ZHANG, Wei Tech ANG**



09:00-09:30  
Assistive Technology and the World Health Assembly Resolution  
**Chapal KHASNABIS** (World Health Organization)



09:30-10:00  
Biomechanical Research on Rehabilitation and its Application  
**Yubo FAN** (National Research Center for Rehabilitation Technical Aids, China)

10:00-10:15 Q&A

10:15-10:30 Tea Break



10:30-11:00  
About Cyborgs and the Cybathlon  
**Robert RIENER** (ETH and University of Zurich, Switzerland)



11:00-11:30  
Rehabilitation Robotics: the MIT Experience  
**Hermano KREBS** (MIT, USA)



11:30-12:00  
Towards Personalized Robotic Rehabilitation  
**Carlos BALAGUER** (Universidad Carlos III de Madrid, Spain)

12:00-12:10 Q&A

## 14 July 2018, PM

**Assistive Technology for Visual Disabilities** Guangda No. 8, 2/F, SEEC Hotel

**Session Chair: Jianmin HU**

13:30-13:50 Opening Address  
13:50-14:05 New Product Release  
14:10-15:00 Workshop on Assistive Technology for Visual Disabilities  
15:00-17:00 Expert Forum on Assistive Technology for Visual Disabilities

**Theme 1:**

The Application of Assistive Technology of Widening Visual Field on the Patients with Severely Damaged Visual Field

**Theme 2:**

The Exploration on Rehabilitation Project of Visually Impaired Children (0-6 years old)

**Theme 3:**

Visual Education under the Background of Medical Education

**Theme 4:**

Artificial Intelligence and Assistive Technology for Visual Impaired

**Theme 5:**

The New Development of Assistive Technology for Visual Impaired

**Theme 6:**

Assistive Technology Service for Visual Disabilities in a New Era

**Theme 7:**

Service Survey of Visual Impaired under the Background of Big Data

14 July 2018, PM

## Brain-Computer Interfaces and Rehabilitation

Guangda No. 9, 2/F, SEEC Hotel

Supported by BrainCo Co. Ltd , g.tec and BIORECO Co. Ltd

**Session Chairs:** **Dingguo ZHANG** (Shanghai Jiao Tong University, China)  
**Jing JIN** (East China University of Science and Technology, China)

**Chair: Dingguo ZHANG**

- 13:30-13:55 Optimization of Brain-Computer Interface and Its Application in Rehabilitation  
**Jing JIN** (East China University of Science and Technology, China)
- 13:55-14:20 Combining Brain-Computer Interfaces and Virtual Reality for NeuroRehabilitation  
**Banghua YANG** (Shanghai University, China)
- 14:20-14:45 Fusion of Electroencephalograph (EEG) and Electromyography (EMG) for Motor Rehabilitation  
**Ping XIE** (Yanshan University, China)
- 14:45-15:10 Hybrid Gaze-Brain Machine Interface based Robotic Arm Control with Augmented Reality Feedback and Shared Autonomy  
**Hong ZENG** (Southeast University, China)
- 15:10-15:15 Q&A
- 15:15-15:30 Tea Break
- Chair: Jing JIN**
- 15:30-15:55 Recent Progress in Multimode Invasive and Noninvasive Brain-Machine Interfaces  
**Dingguo ZHANG** (Shanghai Jiao Tong University, China)
- 15:55-16:20 Applications of Functional Near-Infrared Spectroscopy (fNIRS) in Functional Brain Stimulation and Rehabilitation Evaluation on Stroke Patients  
**Chunguang LI** (Soochow University, China)
- 16:20-16:45 Neuro-Inspired Prosthetic Hand with Realistic Tactile Perception and Neuromorphic Compliant Control  
**Chuanxin NIU** (Ruijin Hospital, Shanghai Jiaotong University School of Medicine)
- 16:45-17:10 A Millisecond-Scale Real-Time Decoded Neurofeedback System for Alpha Amplitude Modulation  
**Gan HUANG** (Shenzhen University, China)
- 17:10-17:15 Q&A

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## Intelligent Neurological Rehabilitation

Guangda No.10 , 2/F, SEEC Hotel

**Session Chairs:** **Jiping HE** (Beijing Institute of Technology, China)  
**Tao XU** (Tongji Hospital Affiliated to Tongji Medical College of Huazhong University of Science and Technology, China)  
**Hermano KREBS** (MIT, USA)

**Chairs: Jiping HE, Tao XU**

- 13:30-14:00 The Role and Mechanism of Rehabilitation Robotics in Neurological Rehabilitation  
**Hermano KREBS** (MIT, USA)
- 14:00-14:30 Research Advances of Posture Control Theory and Applications  
**Jian WANG** (Zhejiang University, China)
- 14:30-15:00 Intelligent Prosthesis and Neural Interface  
**Jiping HE** (Beijing Institute of Technology, China)
- 15:00-15:15 Q&A
- 15:15-15:30 Tea Break
- Chairs: Lijuan AO, Yu PAN**
- 15:30-15:55 Noninvasive Brain Stimulation in the Treatment of Neuropathic Pain  
**Tao XU** (Tongji Hospital Affiliated to Tongji Medical College of Huazhong University of Science and Technology, China)
- 15:55-16:20 Applications of Exoskeleton Robots on Neurological Rehabilitation  
**Mei SHUAI** (Institute of Biomedical Engineering of Beihang University, China)
- 16:20-16:45 Today and Future of BCI from Psychiatrist View  
**Yu PAN** (Beijing Tsinghua Chang Gung Hospital, China)
- 16:45-17:10 Transcranial Focus Ultrasound and Neuromodulation  
**Lijuan AO** (Kunming Medical University, China)
- 17:10-17:30 Q&A

## 14 July 2018, PM

### "Smart Rehab Helps Healthy China" International Rehabilitation Forum

Grand Ballroom, 2/F, SEEC Hotel

13:30-14:00 Opening Remarks & Group Photo  
Chaired by **Hua ZHAI, Chunlei SHAN**

**Chairs: Mingcheng ZHOU, Dongsheng XU**

14:00-14:40 The Application of MTT in the Rehabilitation for Parkinson's Disease  
**Eibo SCHWITTERS**

14:40-15:10 Frontiers in Cardiac Rehabilitation: "Prehab"  
**Shunlin XU**

15:10-15:20 Tea Break

**Chairs: Juntao YAN, Qing DU**

15:20-15:50 The Use of Neuromodulation Technologies in Rehabilitation after Brain Injury  
**Yi WU**

15:50-16:20 Innovation-driven Strategies Promote Rehabilitation Development  
**Shouwei YUE**

## 14 July 2018, PM

### HCR Symposium

Guangda No. 1, 2/F, SEEC Hotel

12:00-13:50 Poster Presentation (SEEC Exhibition Hall)

**Chairs: Bingshan Hu and Yunfeng Ji (Shanghai University for Science and Technology, China)**

13:50-14:10 Opening Speech

#### Session 1 Advanced Human-Robot Interaction

**Chairs: Hao DING (ABB German Institute, Germany)  
Miao LI (COBOT Technology co. Ltd., China)**

14:10-14:30 Multi-modal Human-Robot Cooperation: A Brief Historic Overview and Current Work  
**Alois C. KNOLL (Technische Universität München, Germany)**

14:30-14:50 Health Engineering: From Robotic Arm Human Control To Cardiovascular Diseases Prediction  
**Yuan-Ting ZHANG (City University of Hong Kong, China Hongkong)**

14:50-15:10 Dance Partner Robot to Co-worker Robot "PaDY"  
**Kazuhiro KOSUGE (Tohoku University, Japan)**

15:10-15:30 AI-Enhanced Robot Manipulation and Navigation  
**Il Hong SUH (Hanyang University, Korea)**

15:30-15:50 Tea Break

#### Session 2 Intelligent Rehabilitation Robot I

**Chairs: Qingdu LI (Shanghai University for Science and Technology, China)  
Zhaopeng CHEN (German Aerospace Center, DLR, Germany)**

15:50-16:10 Human-machine Interaction and Neurorehabilitation  
**Etienne BURDET (Imperial College London, UK)**

16:10-16:30 Remote control of heterogeneous devices based on force feedback  
**Hua ZHANG (China Southwest University of Science and Technology, China)**

16:30-16:50 Research on Human Kinesiology and Wearable Robot  
**Caihua XIONG (Huazhong University of Science and Technology, China)**

16:50-17:10 Exoskeleton Systems for Rehabilitation Medicine  
**Hong CHENG (University of Electronic Science and Technology of China)**

17:10-17:30 Neural Interface, Intelligent Prosthesis, and Rehabilitation Robot  
**Jiping HE (Beijing Institute of Technology, China)**

18:00-20:00 **Banquet (Grand Ballroom, 2/F, SEEC Hotel)**

15 July 2018, AM

**Speech Cognitive Rehabilitation Technology** Guangda No. 6, 2/F, SEEC Hotel

**Session Chair: Chunlei SHAN** (Shanghai University of Traditional Chinese Medicine, China)

**Chairs: Yixin ZHOU, Xiaodan LIU**

08:30-09:10 A Global Perspective on the Development of Rehabilitation of Speech, Language and Hearing Sciences and Recommendations for China  
**Lilly CHENG** (San Diego State University, USA)

09:10-09:40 The Development of Evaluation and Training for Neurological Speech Disorders  
**Zhaoming HUANG** (The University of Washington, USA)

09:40-10:10 Research Progress in Behavioral Intervention and Mechanism of Cognitive Aging  
**Chunbo LI** (Shanghai Jiao Tong University School of Medicine, China)

10:10-10:15 Q&A

10:15-10:30 Tea Break

**Chairs: Yan HAN, Jun QIAO**

10:30-11:00 The Role of Neuroimaging and Neuromodulation in Language Cognitive Rehabilitation  
**Chunlei SHAN** (Shanghai University of Traditional Chinese Medicine, China)

11:00-11:30 New Advances of AD and MCI's Diagnosis, Treatment and Rehabilitation Technology  
**Yan HAN** (Yueyang Hospital Affiliated to Shanghai University of Traditional Chinese Medicine, China)

11:30-12:00 Language and Cognitive Rehabilitation Based on Neural Network and Internet  
**Zude ZHU** (Collaborative Innovation Center for Language Ability, China)

12:00-12:05 Q&A

15 July 2018, AM

**The 1<sup>st</sup> International Forum on Industry Development of Assistive Products  
The 4<sup>th</sup> China (Shanghai) Forum on Technology and Industry  
Development of Rehabilitation**

Guangda No. 8, 2/F, SEEC Hotel

**Chairs: Hongliu YU, Wei Tech ANG, Yi WU**

08:30-09:00 Welcome speech from the Organizers, **Hongliu YU**  
Opening remarks from the leader of the Chinese Association of Rehabilitation Medicine(CARM), **Guoen FANG**  
Remarks from the representative of WHO, **Chapal KHASNABIS**  
Remarks from the leader of China Assistive Devices and Technology Centre for Persons with Disabilities, **Xi LI**  
Remarks from the leader of China Association of Assistive Products (CAAP) , **Heping YAN**  
Remarks from the leader of National Research Center for Rehabilitation Technical Aids, **Yubo FAN**  
Remarks from the leader of Shanghai Center of Biomedicine Development, **Daxu FU**

**Chairs: Wuqing YANG, Wenqiang XU**

09:00-09:25 Opening Ceremony for Rehabilitation Robot Alliance under CARM  
Taking Group Photos

09:25-09:50 Development Plan of Medical and Rehabilitation Device Industry in Jinxian County of Jiangxi Province, China  
**Ye TAO** (Deputy County Chief, Jinxian County, Jiangxi Province)

**Chair: Robyn Chapman**

09:50-10:15 Global Coordination on Assistive Technology (GATE) –Now and Future  
**Chapal KHASNABIS** (Director of Assistive Products of WHO)

10:15-10:45 Overview on Industry Development of Assistive Products in China  
**Heping YAN** (Chairman of China Association of Assistive Products)

10:45-10:55 Tea Break

**Chair: Xiaoyu ZHANG**

10:55-11:20 Overview on Development of Assistive Products Service for Person with Disability in China  
**Hongtao ZHANG** (Director, Industry Development Office of China Assistive Devices and Technology Centre for Persons with Disabilities)

- 11:20-11:45 Profile of Technology Support Policies on Assistive Products in China  
**Yue SU** (Deputy Director of Department of Chemical Medicine and Medical Devices, Chinese Biotechnology Development Center)
- 11:45-12:10 Assistive Technology Industry in Thailand: from Legal Provision and Government Economic Policies to Investment Opportunity  
**Monthian Buntan** (National Legislative Assembly, Royal Thai Parliament, Thailand)

## 15 July 2018, PM

Supported by: Changzhou Qianjing Rehabilitation Co., Ltd.  
Jinxian Workstation, Technology Transfer Center, University of Shanghai for Science and Technology (USST)

### Chairs: Shih-Ching CHEN, Tianrun FAN

- 13:00-13:25 The Requirements and Current of the Adaptations of Assistive Products for the Person with Disability in China  
**Xiaoming XU** (Vice-Standing President of China Association for Rehabilitation and Disabled)

- 13:25-13:50 AT in Australia – Delivering What People Need  
**Robyn CHAPMAN** (Assistive Technology Australia)

### Chairs: Simon WONG, Yongzheng HE

- 13:50-14:15 Profiles on Clinical Application of Assistive Products in Hong Kong  
**Simon WONG** (Hong Kong Occupational Therapy Association)

- 14:15-14:35 The Database of Assistive Products in Asia  
**Wei Tech ANG** (Founding President of Coalition of Rehabilitation Engineering and Assistive Technology, Asia)

- 14:35-15:00 Innovation practices on industry Development of Enterprises on Rehabilitation in China  
**Tianrun FAN**

15:00-15:15 Tea Break

### Chair: Yuichiro HONGDA

- 15:15-15:35 State of the Art on Standards of Assistive Products in China  
**Xiaoyu ZHANG** (China Association of Assistive Products)

- 15:35-15:55 Industry development and clinical application of assistive products in Taiwan  
**Shih-Ching CHEN** (Chairman of Taiwan Rehabilitation Engineering and Assistive Technology Society (TREATS))
- 15:55-16:20 The State of the Art of Development of Nursing Care Robots in Japan  
**Yuichiro HONDA** (Hyogo Rehabilitation Center, Japan)
- 16:20-17:00 Work Meeting of Committee of Technology and Industry Development, CARM  
All Committee Members

## 15 July 2018, AM

### Workshop on Central Nervous System Injury Rehabilitation: Concept and Practice — Comprehensive Rehabilitation for Foot&Ankle

Guangda No.11, 2/F, SEEC Hotel

### Chairs: Huifang WANG, Yan ZHU

- 08:30-09:15 Common Dysfunctions at the Foot and Ankle with Secondary Osseous Changes after CNS Injury  
**Wenhua CHEN**

- 09:15-10:15 Commonly Applied Biomechanical Analysis and Physical Examination of Lower Extremities in Foot and Ankle Rehabilitation  
**Bo YU**

10:15-10:30 Tea Break

### Chairs: Yanhong MA, Hong ZHANG

- 10:30-11:50 Application of Soft Tissue Taping Techniques on Ankle Dysfunction  
Theory: **Junmin HUANG**  
Practice: **Shifeng KAN**

15 July 2018, AM

## Workshop on Central Nervous System Injury Rehabilitation: Concept and Practice — Comprehensive Rehabilitation for Foot&Ankle

Guangda No.11, 2/F, SEEC Hotel

**Chairs: Xia BI, Weibo LU**

13:30-14:15 Conservative Treatment of Ankle and Hindfoot Disease and the Principle of Brace Designing  
**Chen WANG**

14:15-15:15 Principles and Improvement of Orthosis for Common Diseases of Forefoot and Midfoot  
**Li CHEN**

15:15-15:30 Tea Break

**Chairs: Youguo HAO, Min SHEN**

15:30-16:10 Foot and Ankle Dysfunctions after CNS Injury: A Comprehensive Treatment Strategy of BTXA Injection Combined with Semi-rigid Polymer Tubing  
**Yun MIAO**

16:10-17:10 Clinical Application of Biomechanical Orthopedic Insoles and Hands-on Training Programs in Neurological Rehabilitation Setting  
**Hejian LIU**

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## Assistive Technology for Spinal Cord Injury

Guangda No.9, 2/F, SEEC Hotel

**Session Chairs: Jixiang WU** (Southwest Hospital-The First Hospital Affiliated to Army Medical University, China)  
**Xin FANG** (Prosthetics and Orthopaedic Rehabilitation of Beijing Social Management Vocational College, China)

**Chairs: Zhengquan ZHAO, Xin FANG**

08:30-08:55 Dysfunction and Evaluation after Spinal Cord  
**Jianhua HE** (Tian You Hospital Wuhan University of Science and Technology, China)

08:55-09:20 Occupational Therapy for Spinal Cord Injuries: Adopting the ICF Framework  
**Simon Wong** (Tai Po Hospital, Hong Kong, China)

09:20-09:45 The Application of Assistive Devices for Daily Life in Patients with Spinal Cord Injury  
**Guohui LIN** (Guangzhou Rehabilitation for People with Disability, China)

09:45-10:10 Selection Strategies and Advances of Walking Orthosis in Patients with Spinal Cord Injury  
**Jixiang WU** (Southwest Hospital-The First Hospital Affiliated to Amy Medical University, China)

10:10-10:15 Q&A

10:15-10:30 Tea Break

**Chairs: Xidong LIU, Jianhua HE**

10:30-10:55 Application and Training of Lower Limb Orthosis in Patients with Spinal Cord Injury  
**Zhengquan ZHAO** (Tongji Hospital, Huazhong University of Science and Technology, China)

10:55-11:20 Application of Karen System in Spinal Cord Injury Orthosis Training  
**Xidong LIU** (Sichuan Disabled Rehabilitation Center, China)

11:20-11:45 Application of Partial Mobile Assistive Devices in Spinal Cord Injury  
**Linlin HAN** (Sichuan 81 Rehabilitation Center, China)

11:45-11:50 Q&A

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## Neurorehabilitation

Guangda No.10, 2/F, SEEC Hotel

### Chairs: Yulong BAI, Hong WANG

08:30-09:05 Robot-assisted Gait Training for Early Intervention in Neurological Rehabilitation  
**Zhifeng LIN**

09:05-09:40 State-of-the-art in Clinical Application of Rehabilitation Robot  
**Shen BI**

09:40-10:15 Progress and the Future of Neuromodulation Technology in Rehabilitation Medicine  
**Fumin JIA**

10:15-10:30 Tea Break

### Chairs: Xianzhong MENG, Xiao CUI

10:30-11:00 MRI-guided Interventions for Brain Diseases  
**Zheng WANG**

11:00-11:15 Acute Systemic Hierarchy Treatment on Critical Neurorehabilitation  
**Zhen CHEN**

11:15-11:30 Methodology and Clinical Test of Synergy-based FES for Upper Limb Rehabilitation post Stroke  
**Chuanxin NIU**

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## EMG Technologies

Guangda No. 9, 2/F, SEEC Hotel

Supported by DELSYS Co. Ltd.

**Session Chairs: Sunil Agrawal** (Columbia University, USA)  
**Dingguo ZHANG** (Shanghai Jiao Tong University, China)

### Chairs: Dingguo ZHANG

13:30-13:55 Robotics to Improve Posture and Gait  
**Sunil AGRAWAL** (Columbia University, USA)

13:55-14:20 Intelligent Human-Robot Interaction Technology and Its Application in Rehabilitation Robot  
**Xingang ZHAO** (Shenyang Institute of Automation, China)

14:20-14:45 Complexity Analysis of EMG Signals and Its Applications in Motor Function Evaluation for Patients after Stroke  
**Rong SONG** (Sun Yat-sen University, China)

14:45-15:10 Gesture Control with Single-element Ultrasound Signals: A Comparison with Single-Channel Surface Electromyogram  
**Ning JIANG** (University of Waterloo, Canada)

15:10-15:15 Q&A

15:15-15:30 Tea Break

### Chair: Sunil Agrawal

15:30-15:55 Improve Myoelectric Control for Amputees through Transcranial Direct Current Stimulation  
**Dingguo ZHANG** (Shanghai Jiao Tong University, China)

15:55-16:20 dEMG Motoneuron Measurements for Targeted Rehabilitation  
**Joshua KLINE** (Delsys Research Center, USA)

16:20-16:45 Post-stroke Neuromuscular Changes Revealed by Noninvasive Examination using Surface Electromyography  
**Xu ZHANG** (University of Science and Technology of China, China)

16:45-17:10 Continuous Myoelectric Control for the Prosthetic Upper Limb with Neural Network and Limited Samples  
**Chuang LIN** (Shenzhen Institutes of Advanced Technology, China)

17:10-17:15 Q&A



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## Prosthetic and Orthotic Technology

Guangda No. 10, 2/F, SEEC Hotel

Supported by Ottobock

**Session Chairs: Zhengquan ZHAO, Xiaoyu ZHANG**

**Chairs: Xiaoyu ZHANG, Jixiang WU**

13:30-14:00 New Development of Intelligent Prosthetic & Orthotics Technology  
**Georg Hoffmann-Kuhnt** (ottobock, Germany)

14:00-14:30 Development and Application of Intelligent Paraplegia Assistive Device in China  
**Xiaoyu ZHANG** (China Association of Assistive Products, China)

14:30-15:00 Insights into the Working Mechanism of Prosthetic Orthosis in General Hospitals  
**Zhengquan ZHAO** (Tongji Hospital, Huazhong University of Science and Technology, China )

15:00-15:15 Q&A

15:15-15:30 Tea Break

**Chair: Zhengquan ZHAO, Simon Wong**

15:30-16:00 Amputation Rehabilitation and Clinical Application of Prosthesis  
**Jixiang WU** (Southwest Hospital-The First Hospital Affiliated to Army Medical University, China )

16:00-16:30 Clinical Studies of Prosthetics and Orthotics  
**Xin FANG** (Prosthetics and Orthopaedic Rehabilitation of Beijing Social Management Vocational College, China)

16:30-17:00 Advances in Diagnosis of Pediatric Cerebral Palsy & Treatment of Orthopedic Rehabilitation Therapy  
**Hong LI** (ottobock, China)

17:00-17:15 Q&A

15 July 2018, PM

## Assistive Technology for Pediatric Rehabilitation

Guangda No. 7, 2/F, SEEC Hotel

**Session Chairs: Qing DU** (Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine)  
**Etienne Burdet** (Imperial College London,UK)

**Chairs: Qing DU** (Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine)  
**Hong WANG** (Shanghai University of Medicine&Health Sciences)

13:30-14:00 Digital medicine and 3D printing technology on clinical translation in the fields of Pediatric Rehabilitation Accessories  
**Jinwu WANG** (Shanghai Ninth People's Hospital Affiliated Shanghai Jiao Tong University School of Medicine )

14:00-14:30 Application prospect of robotic technology in neuro-rehabilitation  
**Etienne BURDET** (Imperial College London, UK )

14:30-15:00 Bridging the gap between conventional and robotic therapy: general concepts  
**Georg RAUTER** (University of Basel, Switzerland )

15:00-15:15 Q&A

15:15-15:30 Tea Break

**Chairs: Min SHEN** (Tongji University School of Medicine)  
**Renxiu HUANG** (Liuzhou Maternal and Child Health-Care Hospital)

15:30-16:00 The International Concept of Robotics in Cerebral Palsy Rehabilitation  
**Chih-Feng LIN** (CSMU Affiliated Hospital-Zhongxing Branch )

16:00-16:30 Application of rehabilitation learning aids in institutional rehabilitation and family rehabilitation  
**Hongyun LU** (National University of Singapore )

16:30-17:00 "Go Baby Go" -- Applying Adaptive Techniques to Facilitate Children's Function and Social Participation  
**Grace Tseng** (National University of Kaohsiung )

17:00-17:30 Assistive Technology for Children with Cerebral Palsy  
**Qing DU** (Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine )

17:30-17:45 Q&A

15 July 2018, PM

## Intelligent Assistive Technology

Guangda No. 6, 2/F, SEEC Hotel

- 13:30-13:40 A Hybrid BCI based on SSVEP and EMG of temporalis for Home control  
**Zhang Zhimin**
- 13:40-13:50 Study of Steady State Motion Visual Evoked Potential-based Visual Stimulation Paradigm  
**Guan Kai**
- 13:50-14:00 The application of transcranial magnetic stimulation on the status of auxiliary rehabilitation of learning and memory dysfunction in aged population  
**Zhao dongshuai**
- 14:00-14:10 Game-based for Enhancing Autism Children's Communication Skill in Thailand  
**Anuttri Robkob**
- 14:10-14:20 Quantitative assessment of Parkinsonian tremor based on the tremor amplitude calculation  
**Zhirong Lin**
- 14:20-14:30 A Time-Domain Hand Gesture Recognition System Based on Two-Channel sEMG Signals  
**Yikang Yang**
- 14:30-14:40 A Portable Virtual Reality Glasses for Hemi-spatial Neglect  
**Kuan Luan**
- 14:40-14:50 A Novel Measurement Method for Human's Spinal Morphology  
**Jun ZHAO**
- 14:50-15:00 A Digital Diagnostic Method of Gait Disorders in Parkinson's Disease  
**Yajing Guo**
- 15:00-15:10 A Preliminary Study of Using Artificial Intelligence Technology to Physical Rehabilitation by Kinect-based Rehabilitation System  
**Haoran Wang**
- 15:10-15:30 Tea Break
- 15:30-15:40 The relationship between pain-related evoked potential and pain perception level in the peripheral nervous system  
**Kornkanok Tripanpitak**

- 15:40-15:50 Thai Sign Language Recognition with Leap Motion  
**Thuchchai Jiamsorn**
- 15:50-16:00 Detection and Assessment of Muscular Asthenopia Based on Electrooculogram Signal  
**Lina Li**
- 16:00-16:10 Review on Novel Flexible Wearable Sensors  
**Zhangyi Ma**
- 16:10-16:20 Effects of age and body mass index on foot pressure impulse and trajectory of the center of pressure in residents of Xi'an and surrounding areas  
**Guo Jintao**
- 16:20-16:30 Evaluation Method for Function Decline in Proprioceptors in Elderly People with Low Back Pain  
**Reiya Nishio**
- 16:30-16:40 A preliminary investigation of measuring the elbow joints angles by using the human channel gain  
**Jiang Ruixin**
- 16:40-16:50 Local thickening method of orthopedic insole based on analysis of wearable plantar pressure device and pressure center track  
**Zhao Yiqin**
- 16:50-17:00 Thailand on the Way towards Accessible TV  
**Kamolpun Punpuing**

## 15 July 2018, AM

### HCR Symposium - Collaborative Robots and Applications in Aerospace

Guangda No. 1, 2/F, SEEC Hotel

<b>Session 1</b>	<b>Human Centered Systems</b>
<b>Chairs:</b>	<b>Jianwei ZHANG</b> (Universität Hamburg, Germany) <b>Sheng CHENG</b> (Kunshan Robotechn Intelligent Technology Co., Ltd., China)
08:30-08:35	Welcome Address <b>Chongfeng ZHANG</b> (Aerospace System Engineering Shanghai, China)
08:35-08:55	The Age of Human-Robot Collaboration: Deep Sea Exploration <b>Oussama KHATIB</b> (Stanford University, USA)
08:55-09:15	Advances in Navigation, Grasping and Manipulation for Future Service Robots <b>Amir SHAPIRO</b> (Ben-Gurion University of the Negev, Israel)
09:15-09:35	Health Care Service Robotic System <b>Toshio FUKUDA</b> (Nagoya University, Japan)
09:35-09:55	Safe Human-robot Collaboration: Real-time Motion Planning, Hybrid Control, and Reinforcement Learning <b>Torsten KROEGER</b> (Karlsruher Institut für Technologie, Germany)
09:55-10:15	Space Mechanism and Applications <b>Meng CHEN</b> (Aerospace System Engineering Shanghai, China)
10:15-10:30	Tea Break
<b>Session 2</b>	<b>Human-in-the-Loop: Modelling and Perception</b>
<b>Chairs:</b>	<b>Meng CHEN</b> (Aerospace System Engineering Shanghai, China) <b>Ming LI</b> (Wuhan University, China)
10:30-10:50	Dynamics Simulation and Control of Space Manipulators <b>Huaiwu ZOU</b> (Aerospace System Engineering Shanghai, China)
10:50-11:10	Sensor Fusion and Application: From Autopilot, Robot Astronauts to Rail Examination <b>Dezhen SONG</b> (Texas A&M University, USA)
11:10-11:30	Modeling and Control of Unstable Physical Human-Machine Interactions: A Rider-Bikebot Example <b>Jingang YI</b> (Rutgers University, USA)
11:30-11:50	Enabling Robot for Elderly Health Monitoring <b>Shigang YUE</b> (University of Lincoln, United Kingdom)
11:50-12:10	Cooking Robotics: AI Meets Physical World <b>Yu SUN</b> (University of South Florida, USA)

## 15 July 2018, PM

### HCR Symposium

Guangda No. 1, 2/F, SEEC Hotel

<b>Session 1</b>	<b>Intelligent Rehabilitation Robot II</b>
<b>Chairs:</b>	<b>Robert RIENER</b> (ETH Zurich, Swiss) <b>Chaoli WANG</b> (Shanghai University for Science and Technology, China)
13:30-13:50	Medicine 4.0: Common Challenges in Rehabilitation and Medical Robotics <b>Georg RAUTER</b> (University of Basel, Switzerland)
13:50-14:10	The Development of Rehabilitation Robots <b>Zhen LIU</b> (Nagasaki Institute of Applied Science, Japan)
14:10-14:30	Assistive Exoskeletons for Motion Assistance: Development Challenges and Applications <b>Shaoping BAI</b> (Aalborg University, Denmark)
14:30-14:50	Rehabilitation Robotics: from Machine Centered to Human Centered <b>Jinwu Qian</b> (Shanghai University, China)
14:50-15:10	Neuromodulation Theory and Design of Rehabilitation Training Robot <b>Jue WANG</b> (Xi'an Jiao Tong University, China)
15:10-15:30	Design and Application for Service Robots <b>Ming LIU</b> (Hong Kong University Science & Technology, China Hong Kong)
15:30-15:50	Tea Break
<b>Session 2</b>	<b>AI in Medical Robot Systems</b>
<b>Chairs:</b>	<b>Qingjie ZHAO</b> (Beijing Institute of Technology, China) <b>Ruiqin LI</b> (North University of China, China)
15:50-16:10	Assistive Robotic Handheld Instrument for Microsurgery <b>Wei Tech ANG</b> (Nanyang Technology University, Singapore)
16:10-16:30	Collaborative Human-Centered Medical Robotics with Continuum and Compliance <b>Hongliang REN</b> (National University of Singapore, Singapore)
16:30-16:50	Medical Robot Promotes Smart-Health Innovation <b>Lining SUN</b> (Soochow University, China)
16:50-17:10	Lower-Limb Wearable Robots: Noninvasive Human-Robot Interfaces and Control Strategies <b>Qining WANG</b> (Peking University, China)
17:10-17:30	The Trend of Integration and Collaboration of AI2.0 and Robot2.0 <b>Jingtai LIU</b> (Nankai University, China)
17:30-17:50	Technology of AI-Assisted Medical Diagnosis and its Applications <b>Wenqiang ZHANG</b> (Fudan University, China)

16 July 2018, AM

## Neuro-Rehabilitation Robotics and Human-robot Interaction

Guangda No. 6, 2/F, SEEC Hotel

- 08:30-08:40 Structure Design of a Reconfigurable Modular Robot  
**Liu Kaiyuan**
- 08:40-08:50 Experience and Lessons in the Research and Invention of XY- Upper Limb Rehabilitation Robots  
**Li Wei**
- 08:50-09:00 Safety Related Requirements for Wearable Rehabilitation Robots  
**Yibing Zhao**
- 09:00-09:10 Exoskeleton Gait Control Strategy to Overcome Lateral Overbalance  
**Zhangyi Ma**
- 09:10-09:20 Kinect-based Interactive Games with Joint Measurements to Assist Upper Limb Rehabilitation  
**Peng Nan**
- 09:20-09:30 Structure Optimization and Simulation Analysis of Multi-Modal Perceptive Humanoid Finger Sensor  
**Wenqi Zhang**
- 09:30-09:40 Concept for Using a 6-DOF Parallel Manipulator In Passive Upper Limb Rehabilitation  
**Amnad Tongtib**
- 09:40-09:50 Kinematic Control of a Dual-arm Humanoid Mobile Cooking Robot  
**Gen Pan**
- 09:50-10:00 Development of Wearable Sensor Shoes Fused with Range Sensor Arrays  
**Guangyi Li**
- 10:00-10:10 A Review of the Control Solution for Rehabilitation Robot  
**He Hongjun**
- 10:10-10:30 Tea Break
- 10:30-10:40 Path Planning for Wheeled Mobile Service Robots based on Improved Genetic Algorithm  
**Shuang Li**

- 10:40-10:50 Feasibility Study of Virtual Reality with Integrated Biofeedback for Robot-Assisted Gait Training  
**Jen-Shuan CHANG**
- 10:50-11:00 The Design of a Indoor Guide Robot Based on Embedded Control System  
**Peng Zhao**
- 11:00-11:10 A method based on grey theory toward the multi-sensor information fusion of human centered robots  
**ZHANG Yicha**
- 11:10-11:20 Generating Robust Grasps for Unknown Objects in Clutter Using Point Cloud Data  
**Hongzhuo Liang**
- 11:20-11:30 Augmenting working areas with action-relevant information for intuitive human-robot cooperation  
**Bernd Kast**
- 11:30-11:40 Development of Power Add-on Unit for Manual Wheelchair and Its Sensorless Power Assistance Control  
**Peirang Li**
- 11:40-11:50 Sensorless Power Assistance Control for an Upper Limb Exoskeleton Robot  
**Naoyuki Ogawa**
- 11:50-12:00 Study on Lens Distortion Model for Mobile Gaze Tracking  
**Dan Su**

16 July 2018, AM

## Intelligent Assistive Technology & Neuro-Rehabilitation Robotics and Human-robot Interaction

Guangda No. 7, 2/F, SEEC Hotel

### Session1: Intelligent Assistive Technology

- 08:30-08:40 "9-Square Matrix" Aerobic Exercise Recognition using Image Processing  
**Sweta Dwivedi** ( Thailand )
- 08:40-08:50 Gait analysis of patients with knee osteoarthritis before and after Thai massage treatment  
**Onamon Kaesornpornmanee, Karaked Pakwang** ( Thailand )
- 08:50-09:00 Design and Verification of a New 3D Printed Customized Unilateral Load-reduction Knee Brace  
**Xu Yuanjing** ( China )
- 09:00-09:10 A Pre-processing Technique for BLE-based Indoor Localization  
**Shanatip Choosaksakunwiboon** ( Thailand )
- 09:10-09:20 Using Surface Electromyography To Assess Vastus Lateralis, Rectus Femoris and Vastus Medialis Muscle Strength Pre-And Post-Reconstruction  
**Li Keke, Cao Manlin, Li Yan\*, Gao Fang\*** ( China )
- 09:20-09:30 Rehabilitation effect of pain and function in patients with rotator cuff lesions by TENS based on the theory of wrist-ankle acupuncture: A Randomized Controlled Clinical Trial of a wearable electrical stimulation device  
**Wenjuan Song, Jishen Zhou, Ping Shi, Wei Gu, Fanfu Fang** ( China )
- 09:30-09:40 A Variety of Human-computer Interactions of Smart Wheelchair  
**LI WENXIU, YU HONGLIU, WANG MENG** ( China )
- 09:40-09:50 Research on motion pattern recognition of a new hydraulic intelligent knee prosthesis based on Neural Network Algorithm  
Weiliang Zhao, Hongliu Yu, Wujing Cao ( China )
- 09:50-10:00 Visual Assistant Tracking System Based on UWB  
Xulong Xu, Chaoli Wang ( China )
- 10:00-10:10 Navigation Scheme of Mobile Robots and Its Application at Home Care  
Yinchuan Zhang, Chaoli Wang ( China )
- 10:10-10:30 Tea Break

### Session 2: Neuro-Rehabilitation Robotics and Human-robot Interaction

- 10:30-10:40 Research on exoskeleton rehabilitation robot based on wheelchair platform for upper limbs  
Wang Feng, Yu Hongliu, Ou Daoyang ( China )
- 10:40-10:50 A Virtual Reality Training System Based on Upper Limb Exoskeleton Rehabilitation Robot  
Jinyu Zheng, Ping Shi, Hongliu Yu ( China )
- 10:50-11:00 Research on Control System of Wearable Elbow Exoskeleton  
**Hui Zhang, Qiaoling Meng, Hongliu Yu** ( China )
- 11:00-11:10 A Study of Cable-driven Robot for Upper-limb Rehabilitation  
Hunag Xiaohai, Yu Hongliu, Wang Xiaoming, Xu Peng, Zhang Weisheng ( China )
- 11:10-11:20 A Novel Lower Limb Exoskeleton Robot  
**Jinyue Huo, Hongliu Yu, Wei Ni** ( China )
- 11:20-11:30 Upper-Limb Rehabilitation Robot: State of the Art and Existing Problems  
**Qiaoling Meng, Qiaolian Xie, Hongliu Yu** ( China )
- 11:30-11:40 Application of rehabilitation assistance analysis on the system of elbow exoskeleton  
**Li Xinwei, Yu Hongliu, Wang Xiaoming, Chang Ying, Hao Liang** ( China )
- 11:40-11:50 Service Robot Path Planning Based on Improved Dijkstra Algorithm  
**Chaofeng Zhang, Chaoli Wang** ( China )

## 16 July 2018, AM

### Workshop

#### Smartphones and People with Disabilities: the Power and Technological Promise

Guangda No. 11, 2/F, SEEC Hotel

#### Workshop led by Ong Teck Soon

- 09:00-09:10 Introduction & Overview of workshop
- 09:10-09:30 Objective #1:  
Understanding the smartphones sensors and how they work
- 09:30-10:10 Objective #2:  
Build a simple android app for the visually impaired
- 10:10-10:40 Discussion

## 16 July 2018, AM

### HCR Symposium

Guangda No. 1, 2/F, SEEC Hotel

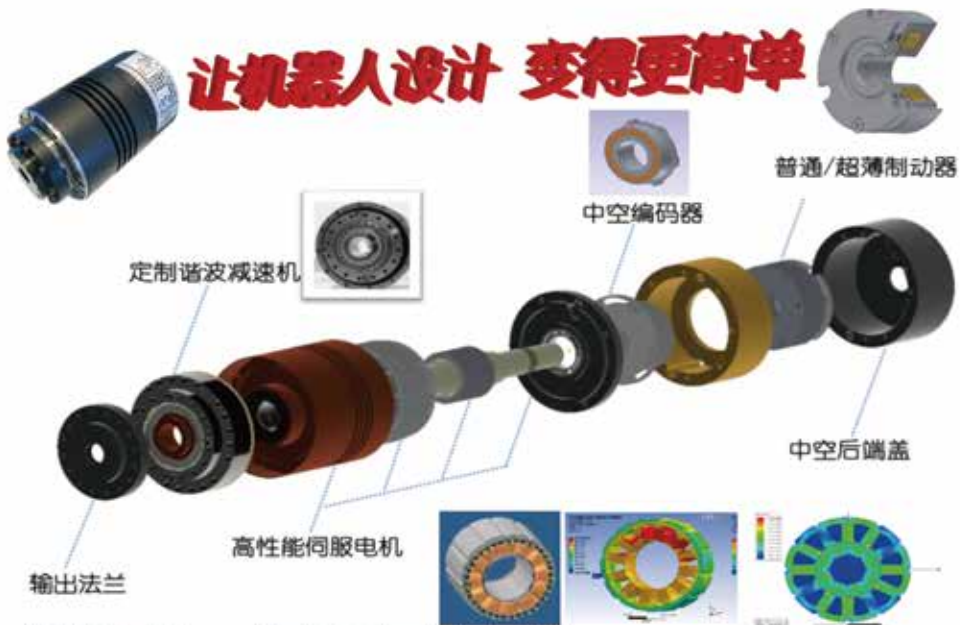
#### Session 1 Human-machine Fusion systems

- Chairs:** **Peter MEUSEL** (German Aerospace Center, DLR, Germany)  
**Song TANG** (Shanghai University for Science and Technology, China)
- 08:30-08:50 Wearable Robotics: Powered Prosthetics to Powered Exoskeletons  
**Thomas SUGAR** (Arizona State University, USA)
- 08:50-09:10 Robotics for Medical Rehabilitation: Global Challenges and Opportunities  
**Shengquan XIE** (University of Leeds, UK)
- 09:10-09:30 Human-friendly assistive robots from the user's perspective  
**Jochen STEIL** (Technische Universität Braunschweig, Germany)
- 09:30-09:50 Innovation of Health Robotic for Aging Society  
**Zhiwei LUO** (Kobe University, Japan)
- 09:50-10:10 Development of Human Support Robotic Systems  
**Chi ZHU** (Maebashi Institute of Technology, Japan)
- 10:10-10:30 Tea Break

#### Session 2 Future Intelligent Robots

- Chairs:** **Ying HU** (SIAT, Chinese Academy of Sciences, China)  
**Zhongcheng GUI** (Shanghai Guimu Robot co. Ltd.)
- 10:30-10:50 Advanced Control of Humanoid Robot  
**Rong XIONG** (Zhejiang University, China)
- 10:50-11:10 Safe Human Robot Interaction of Forced Controlled Rehabilitation Robot  
**Feng GAO** (Shanghai Jiao Tong University, China)
- 11:10-11:30 Neurorehabilitation and Neural Repair with Intelligent Robots  
**Yong YU** (Kagoshima University, Japan)
- 11:30-11:50 Towards More Flexible Calibrations for Visual Sensing and Tracking  
**Youfu LI** (City University of Hong Kong, China Hong Kong)
- 11:50-12:10 Robust Software Architecture for Human Centered Robot  
**Xiaorui ZHU** (Harbin Institute of Technology, China)

# 让机器人设计 变得更简单



模块化设计：一体电机/电动关节组件  
典型应用场景：助力机器人/移动机器人/协作机器人

## 智能助力机器人

融合人机实时性控制、动态失稳平衡控制、意图识别等技术  
可用于康复医疗、老人助行、残疾人辅助行走等领域



## 协作机器人

融合柔性关节设计技术、多传感器融合技术等  
技术，可用于敏捷制造、人机协作等领域



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## Invited Guests



**Guoen FANG**  
Chairman of the Chinese Association of  
Rehabilitation Medicine (CARM)



**Enxi NIU**  
Party Secretary of the Chinese Association  
of Rehabilitation Medicine (CARM)



**Xi LI**  
Director of China Assistive Devices and  
Technology Centre for Persons with  
Disabilities



**Heping Yan**  
Chairman of China Association of Assistive  
Products



**Gang HUANG**  
President, Shanghai University of  
Medicine & Health Sciences