

Special Lecture

August 23, 2017

12:30-14:00 |

B1F Main Hall



Akiko Fukuda

Secretary General, World Federation of the Deafblind / International Cooperation Committee member, The Japan Deafblind Association (person with multiple disabilities)

CV

- Born in 1977 in Fukuoka prefecture
- Raised in Saga prefecture until high school
- Bachelors of Arts from Tokyo Womans' Christian University (Japan)
- Master of Social Work from Washington University in St. Louis (USA)
- 2004-2005 Consultant, Inter-American Development Bank (USA)
- 2005-2006 Assistant Regional Development Officer, Disabled Peoples' International Asia-Pacific Region (Thailand)
- 2006-2009 International Community Center, Waseda University (Japan)
- 2009-2012 Clinical Development Officer, Zimmer Inc. (Japan)
- 2012-current International Corporation Committee member, Japan Deafblind Association (Japan)
- 2013-current Secretary General, World Federation of the Deafblind

Abstract

Technology for the Deafblind and Its Possibility and Limitation

It is estimated that around 14,000 deafblind people are living in Japan. Difficulty in seeing and hearing causes extremely-limited accessibility in every sector of daily lives from communication to moving around. Thus, they are easily isolated and excluded from mainstream society. Advancement of technology has made a significant breakthrough for us deafblind to be connected or reconnected to the world once we are forgotten. Deafblind people got a tool to be united even beyond international borders. Technology shed some light on us but still remains darkness which cannot be solved by itself.

My life was once shut down in the course of losing hearing and sight. Even before I lost these two senses I have developed severe impairments in mobility and breathing already but inability to move or breathe did not limit my access to mainstream world that much. Being deafblind is a totally different story. Everything around me lost its existence, even a person next to me. I only know by being physically touched. There is no one around me even in the crowd.

Being connected – that is all what matters to us. It is said that deafblindness causes three major difficulties: communication, getting information, and moving around. No information is gained automatically. Whether it is morning or night, I cannot tell by myself. Time, location, who is with me – there is no clue. There is no way to access by myself.

Only way we can access to world fully by ourselves is through technology. Tactile watch and Braille Display are such examples. Advancement of technology changed our lifestyle from “being approached and controlled by others” to the agent of own lives. Now I am driving my life and enjoying to its fullest.

However, there is still a challenge that technology cannot solve or overcome. Human brings technology but technology cannot create human. We need someone who guides us which technology to choose and how to use in our own different communication methods. Each deafblind person has her/his own way of communication. In case of natural disaster or fire, how would we know if it is coming? How can we make a phone call? How can we enjoy movie and music? How can we decide where we want to go and move around? With a bit of warm hands behind technology, our lives can be fully nourished. Severe shortage of such warm hands is a limitation for us to embrace this wonderful world that technology can bring about.

Plenary Lecture

August 22, 2017

14:00-15:00 |

B1F Main Hall



Hong-liu Yu

Professor and the director of the Institute of Rehabilitation Engineering and Technology, University of Shanghai for Science and Technology (USST), China
President-elect of Coalition of Rehabilitation Engineering and Technology Asia (CREATe Asia)
President of Shanghai Engineering Research Center of Assistive Devices, China

CV

Dr. Yu Hong-liu is a professor and the director of the Institute of Rehabilitation Engineering and Technology, University of Shanghai for Science and Technology (USST). He obtained his Ph. D degree with the study in the field of rehabilitation engineering and intelligent control and is now responsible for leading the program and discipline of Rehabilitation Engineering in USST. Professor Yu has published over 110 papers and 5 books, and is authorized for more than 100 patents in rehabilitation engineering. He is now the President-elect of Coalition of Rehabilitation Engineering and Assistive Technology, the president of Shanghai Engineering Research Center of Assistive Devices(SERCAD) and the Secretary General of Rehabilitation Devices Committee of China Association of Assistive Products(CAAP). He is also the Chief Editor of Journal of International Rehabilitation Engineering and Devices.

Abstract

Development of Rehabilitation Robotics in China

The presentation will give an overview to the technical advances of rehabilitation robotics in China. Based on discussion on the concept and classification of rehabilitation robots at first, the typical rehabilitation robots developed for daily life assistance and rehabilitation therapy by research institutions and companies of China are introduced. The application situation of rehabilitation robots in medical institutions is also presented.





Shingo Shimoda

Unit Leader, Intelligent Behavior Control Unit, RIKEN, BSI-TOYOTA Collaboration Center, Japan

CV

- **Current Position**

Unit leader
Intelligent Behavior Control Unit,
RIKEN, BSI-TOYOTA Collaboration Center

- **Education**

The University of Tokyo, Ph.D. Department of Electronics Engineering, 2005
The University of Tokyo, M. Science Department of Environmental studies, 2001
The University of Tokyo, B. Science Department of Mechano-Informatics, 1999

- Academic Position

2005-2007: Research Scientist, Biological Control System Laboratory, RIKEN
2003-2004: Visiting student, Field and Space Robotics Laboratory, Massachusetts Institute of Technology

- **Awards**

IEEE Robotics and Automation Society Most Active Technical Committee, 2017
RIKEN Industry Partnerships Contribution Award, 2016
IROS CoTeSys Cognitive Robotics Best Paper Award in IROS 2010
General Chairs' Recognition Award in 48th IEEE Conference on Decision and Control (CDC2009)
Research Encouragement Award, The Robotics Society of Japan, 2002

Abstract

Intelligent Robot Control for Supporting Human Behaviors

Symbiotic interactions between human motions and robot motions are one of the most important factors for the comfortable behavior support by the robots. How are our behaviors controlled by brain? How different between our behavior control and robot control principles? These questions provide us the interesting clues to develop the symbiotic robot controller with human behaviors.

The most interesting feature of biological learning system is "Bi-directional Learning", that is, top-down and bottom-up learnings are mixture in our learning process. Top-down learning is explicit learning process where we are aware of the correct target for learning and are able to know that we are succeeded to reach to the target or not. Thus, we can intentionally search the appropriate method for the target behaviors.

Bottom-up learning is, on the other hand, tacitly progressed through body/environment interactions. The main purpose of bottom-up learning is behavior adaptations. We cannot intentionally detect what is the correct target but acquire the learning results as tacit knowledges. For instance, we can walk with very efficient gait comparing with the most advanced humanoid robots. We don't know, however, the detail control method for the walking though we can do it. That is because we have tacitly acquired the good algorithm through our life. Bottom-up learning can tune our behaviors more suitable one with our body and the environment without knowing the explicit target.

For comfortable behavior supports by robots, both human and robots adapt the behaviors each other by the bottom-up learning. I will introduce in this talk the robot learning system called tacit learning that shares the many aspects with human bottom-up learning method. Tacit learning can tune the roughly-defined robot behaviors to the sophisticated ones through robot/human interactions. We applied the learning method to motion support system such as exoskeleton robots for walking support, forearm prosthesis for wrist rotation control and post-stroke patient rehabilitation systems. The experimental results show that the behaviors of the patients and the robots were well adapted each other and created the efficient motions.



Takenobu Inoue

Director of Department of Assistive Technology, Research Institute of National Rehabilitation Center for Persons with Disabilities

CV

Education

March 1989 Master of Sciences in Engineering, Keio University Department of Mechanical Engineering

Employment History

2007 to present Director of Department of Assistive Technology, Research Institute of National Rehabilitation Center for Persons with Disabilities
 2001 to 2007 Section Chief of Assistive Products Section, Department of Assistive Technology, Research Institute of National Rehabilitation Center for Persons with Disabilities
 1989 to 2001 Researcher, Department of Assistive Technology, Research Institute of National Rehabilitation Center for Persons with Disabilities
 2004 to 2007 Associate Professor, School of Engineering, The University of Tokyo.
 1996 to 1997 Centre for Studies in Aging, Sunnybrook Health Science Centre, University of Toronto (Internship Program of Japanese Government)

Professional Services

2014 to present Convener, ISO/TC173/SC2/WG12, Classification and Terminology of Assistive Products
 2016 to present Board Member, Japanese Society of Biomechanisms
 2016 to present Board Member, Japanese Society for Well-being Science and Assistive Technology

Abstract

Research and Innovation of Assistive Technology – User Participation and Field-based Innovation

Research and development of assistive technology space is changing so quickly all over the world and also in Japan, in these days. WHO takes a lead in global procurement and R&D of ATs through GATE (Global Cooperation on Assistive Technology) initiative. While in Japan, promotion programs for matching needs and technologies in AT space are increasing. Ministry of Economy, Trade and Industry (METI) and Ministry of Health, Labour and Welfare (MHLW) promote robotic assistive technology development and evaluation program. The MHLW also conducts assistive technology for persons with disabilities development program. These two programs set target technologies and target user groups and also mandate field tests for each project.

Based on these trends in AT space, user participation in research and innovation process is getting more important. In addition, these processes should be conducted in the expected utilization field of developing technologies as much as possible, which we call field-based innovation. In this presentation, two examples will be introduced. One is development of electric powered wheelchairs according to individualized user participation, another is development of information support robot according to field-based innovation.

The first project intended to develop four kinds of electric powered wheelchairs for persons with severe cerebral palsy or muscular dystrophy. Four target users asked to cooperate with whole process of the developments. Speech recognition technology, image recognition technology, MEG detection technology and force detecting technology were selected as human interface technologies for operating the wheelchairs. The four novel wheelchairs showed good results of evaluation in the real utilization fields. In addition, the engineers who participated in the project suggested effectiveness of the individualized user participation for the developments.

The second project intended to develop information support robot for older persons with mild cognitive decline. Data aggregation from target user group at the living situation, participation observation in an independent living facility for fixing the function of the robot, and group interviews with 124 older people living in community, design workshop with the expected stakeholders for fixing the concept of the service systems including the robot. The results of the field test showed effectiveness of the information support robot system.

User participation and field-based innovation will be more important and more useful for development of assistive technologies to support daily living. On the other hand, some of the issues are pointed out, e.g. ethics, safety and burden. More discussion and consideration will be needed.



Tim C. Lueth

Professor and Director of the Institute of Micro Technology and Medical Device Technology of the Technical University Munich (TUM), Germany

CV

Tim C. Lueth, is Professor and Director of the Institute of Micro Technology and Medical Device Technology of the Technical University Munich (TUM), Germany. From 2013 to 2016, he served as dean of the Mechanical Engineering Faculty at TUM. He was born in Hamburg, Germany, in 1965, and received his diploma degree in electrical engineering from the Darmstadt University of Technology, Germany in 1989. Afterwards, he received the Ph.D. degree in robotics and his habilitation degree in computer science from the University of Karlsruhe in 1993 and 1997, respectively. In 1994-1995, he was a Visiting Researcher at the MITI-AIST Electrotechnical Laboratory in Tsukuba, Japan. In 1997, Lueth became Professor for surgical navigation and robotics at the medical school Charité Berlin (HU). In 2001, he became the Director for Mechatronic Medical Technology at the Fraunhofer-Institute for Production Systems and Design Technology IPK. Since 2005, Lueth works at TUM. In 2006, he received a professor status at the University of Toronto, Canada. The European Patent Office elected him in 2007 as TOP-3 inventor in the category "lifetime achievement" for his patent activities in the area of surgical robotics and navigation. He received several national and international awards for his research on medical devices. In 2010, Lueth became elected Member of "acatech," the German National Academy for Science and Technology. Lueth is active Member of the IEEE R&A Chapter and the IEEE EMB Chapter.

Abstract

From Patient Individual Surgical Robots to Automated Design of Assistance Mechanisms: CAD Systems for the Human Body and Certification of Products

Surgery, rehabilitation and elderly care are big markets for robot technology beside industrial production. The surgical robot company "Intuitive Surgical" has already today a higher market capitalization in comparison with all other robotics companies. The value is comparable to automotive companies. There is a clear new trend to design humans specific complex devices in addition to industrial or transportation systems. In this field of human related technology also some private companies such as Otto Bock, Medi etc. are very successful. Nevertheless, computer aided design tools to support the construction of those human adapted complex mechanisms and robots are still missing.

In the talk, I will present some examples of the design of complex mechanisms and robots for human application in surgery, rehabilitation or elderly care. Beside the design also regulatory affairs such as ISO 9001/ ISO 13485 and the new Medical Device Directive are relevant. There is a strong need to support the design and documentation processes by new software systems to reduce the time consuming processes of getting a CE/FDA approval for new devices

The third part of the talk deals with the automated design of robots and manipulator mechanisms for additive manufacturing and laser cutting. Those design tools today the key for rapid production of patient specific assistance.



Haruki Nakamura

President, Japanese Association of Occupational Therapists

CV

Academic Background

1977 - OT Diploma, Rehabilitation Institute of National Sanatorium Kinki-Chuo Hospital
(changed to "National Hospital Organization Kinki-Chuo Chest Medical Center" since April 1, 2004)
OT Licensure from Ministry of Welfare, Japan

Work History(Last Three Posts Held)

2006 - Hyogo Prefectural Rehabilitation Center at Nishi-harima, Hyogo Prefectural Rehabilitation Hospital at Nishi-harima

2010 - Hyogo Rehabilitation Center Central Hospital

2015 - present: President (full-time), Japanese Association of Occupational Therapists since April

Social Activities

- President of Japanese Association of Occupational Therapists
- Trustee of Japan Visiting Nursing Foundation, etc.

Abstract

Utilization of Welfare Equipment in Aging Society – Current Status and Issue in Japan

In 2025, Japan's population aged 65 or older will account for 30.3% of its total population and that aged 75 or older will account for 18.1%, and the number of elderly people who live alone or need social care tends to increase until 2035. The rental welfare equipment covered by the long-term care insurance includes wheelchairs, special beds, bedsore prevention tools, slopes, walkers, walking sticks, sensing systems for wandering elderly with dementia, transfer lifts and automatic excretion treatment devices. Approximately half of the recipients of the long-term care benefit are utilizing these items. Beds and wheelchairs occupy a large portion of their utilization rate. Chronologically, the number of rented items of welfare equipment in Kobe city was 1,392 in April 2000, and increased by 66 times to 92,637 in September 2016. The number of rental dealers also increased from 10 to 116. While the number of rented items has been increased and the supply system has been enhanced like this, the data on the effectiveness of welfare equipment are being required, for example, on whether such equipment is applied and used suitably for users' daily life functions.

Meanwhile, development and spread of nursing care robots are in progress as part of national policy. There are three projects related to the Ministry of Health, Labour and Welfare as follows: "Establishment of a council for cooperation and coordination between needs and seeds," "Project for supporting practical applications of welfare equipment and nursing care robots" and "Model project for supporting development of nursing care technologies by utilizing nursing care robots." In this presentation, I introduce some of them.

In Japan, we are questioning how elderly people's dignity and independence should be supported while our society is aging and its working-age population is decreasing. We have to address various issues, including physical points of welfare equipment and nursing care robots, user education of such equipment, sharing of principles and review of the rules. Today my presentation covers some of them, which I hope will be informative for your countries' future cases.

Program

August 22, 2017

Paper Presentation - PP1

B1F Main Hall

16:00-17:30 | Hand Exoskeleton / Upp-Limb Prosthesis

- PP1-1 Therapeutic Hand Robot(THR) with pre-programmed courses and voice- or sound-activated commands for post-stroke rehabilitation
Ong Teck Soon
(School of Engineering, Ngee Ann Polytechnic, Singapore)
- PP1-2 Gripping motion evaluation of 3-Digits 7-joints myoelectric controlled hand
Tomohisa Morita
(Graduate School of Science & Engineering, Tokyo Denki University, Japan)
- PP1-3 Upper limb posture angle estimation controller For 3-DOF powered transradial prosthesis
Kimihito Hayashi
(Graduate School of Science & Engineering, Tokyo Denki University, Japan)
- PP1-4 Mechanical design of an elbow exoskeleton device
Qiaoling Meng
(Institute of Rehabilitation Engineering and Technology / Shanghai Engineering Research Center of Assistive Devices / Key Laboratory of Neural-functional Information and Rehabilitation Engineering of the Ministry of Civil Affairs / University of Shanghai for Science and Technology, China)
- PP1-5 Research advance on key technology of EMG-based control for hand exoskeleton robots
Qingyun Meng
(School of Medical Institute, Shanghai University of Medicine & Health Science, China)
- PP1-6 Preliminary research of a novel wearable hand function training exoskeleton based on EMG triggering
Hongliu Yu
(Institute of Rehabilitation Engineering and Technology, University of Shanghai for Science and Technology (USST), China)

Paper Presentation - PP2

5F Room 502

16:00-17:15 | Language / Communication

- PP2-1 Recognizing words in thai sign language using flex sensors and gyroscopes
Rujira Jitcharoenport
(Assistive Technology Group, Department of Computer Engineering, Chulalongkorn University, Thailand)
- PP2-2 Towards automatic diagram description for the blind
Ekapol Chuangsuwanich
(Assistive Technology Research Group, Faculty of Engineering, Chulalongkorn University, Thailand)
- PP2-3 Reading mathematical expression in Thailand
Nattapat Boonprakong
(Chulalongkorn University, Thailand)

- PP2-4 A case study of reading disability: using non-word reading and word writing
Puttachart Potibal
(Kasetsart University, Thailand)
- PP2-5 Analysis of multi-meaning graphic symbols for Thai Minspeak® software phase II
Sarinya Chompoobutr
(National Electronics and Computer Technology Center / National Science and Technology Development Agency, Thailand)

Paper Presentation - PP3

5F Room 504-5

16:00-17:45 | Life Support

- PP3-1 Touchscreen device size suitable for icon search by blind users
Rei Asakura
(Graduate School of Science and Technology, Niigata University, Japan)
- PP3-2 A proposal for improvement of usability of browsing and playback systems for DAISY and EPUB
Kazunori Minatani
(National Center for University Entrance Examinations, Japan)
- PP3-3 Developmental stage for ECS-make your life colorful-
Hiroshi Ishihara
(Research & Development Department in Hashimoto Artificial Limb Manufacture Co., LTD, Japan)
- PP3-4 Development of BCI system for functional substitution: controlling FES
Jongsook Sanguantrakul
(Department of Biomedical Engineering, Faculty of Engineering, Mahidol University, Thailand)
- PP3-5 Hip and ankle regulations that reduce defecation time in elderly
Pattama Madaeng
(Srinakharinwirot University, Thailand)
- PP3-6 Development of excretion supporting device for person with a spinal cord injury
Megumi Ando
(Hyogo Rehabilitation Center, Japan)
- PP3-7 Accelerometer-based bed exit alarm for patient monitoring
Surapa Thiemjarus
(Rehabilitation and Assistive Technology Laboratory, National Electronics and Computer Technology Center, Thailand)

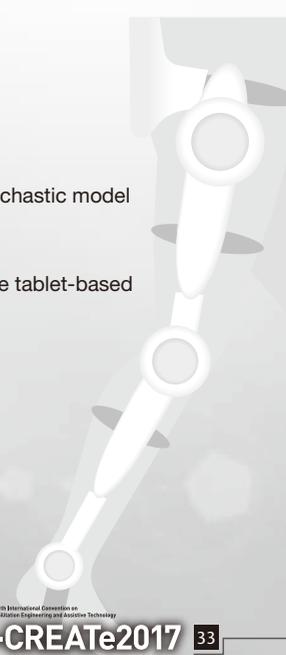
9:45-11:00 | **Mobility**

- PP4-1 Design and simulation of a wheelchair mounted lightweight compliant manipulator
Bingshan Hu
(University of Shanghai for Science and Technology, Shanghai Engineering Research Center for Assistive Devices, China)
- PP4-2 Development of chair with improved mobility performance
Tomoyuki Murata
(Kanagawa Rehabilitation Center, Japan)
- PP4-3 Obstacle avoidance feedback system for the blind using stereo sound
Kawin Metsiritrakul
(Department of Computer Engineering, Faculty of Computer Engineering Chulalongkorn University, Thailand)
- PP4-4 “iSonar-2: obstacle warning device, the assistive technology integrated with universal design for the blind”
Surapol Vorapatratorn
(Department of Computer Engineering, School of Information Technology, Mae Fah Luang University, Thailand)
- PP4-5 Instability predicted by instantaneous dynamic stability: A preliminary study on periodic and fall recovery motion
Amaraporn Boonpratotong
(Srinakharinwirot University, Thailand)

Paper Presentation - PP5

14:10-15:10 | **Research & Development**

- PP5-1 Model-based design of PEMS for medical devices
Supachai Vorapojpisut
(Thammasat University, Thailand)
- PP5-2 Simple calibration method for low-cost eye-tracker
Takehito Kikuchi
(Faculty of Science and Engineering, Oita University, Japan)
- PP5-3 Virtual restoration of down-sampled EMG signals using a stochastic model
Akira Furui
(Graduate School of Engineering, Hiroshima University, Japan)
- PP5-4 Low-noise high-power amplification system design for mobile tablet-based audiometry
Siwat Saibua
(National Electronics and Computer Technology Center, Thailand)



9:15-10:15 | AT Situation (Nation / Region)

- PP6-1 A study on the role of disability awareness workshop in promoting social inclusion: case of visual impairment in tunisia
Sami Ben Fradj
(Kobe Design University, Japan)
- PP6-2 Assistive products in bangladesh: The state of the art and problems
Mehedi Hasan Khan
(Graduate School of Rehabilitation, Kobe Gakuin University, Japan)
- PP6-3 Can the silver economy answer for Thai aging society?
Kamolpun Punpuing
(National Science and Technology Development Agency, National Electronics and Computer Technology Center, Thailand)
- PP6-4 Equipment support for emergency calling device for patients with incurable at home
Toshihiro Kawai
(Saitama Rehabilitation Center, Japan)

WKC Forum

13:00-15:00 | Role of Assistive Technology in Rapid Ageing in Asia and the World

Opening Address

Sarah Louise Barber
(Director, WHO Kobe Centre, Japan)

Keynote Lecture

Assisted Living in a Danish Perspective - with special focus on the ageing population and related challenges

Henrik Hjorth
(Director, Creative Impact, Denmark)

Reports by Practitioners: Support for Independent Living using AT

Masako Okuhira
(Expert on International Relations, Japanese Society for Rehabilitation of Persons with Disabilities, Japan)

Hiroyuki Shinoda
(Lecturer on Seating Engineering, Sakura Wheelchair Project, Japan)

Kazushi Matsumoto
(Executive Director, Asian Seating Assistance Project (ASAP), Japan)

Paper Presentation - PP7

10:45-11:45 | Lower Limb Orthosis / Prosthesis

- PP7-1 Finite-element based orthotics design tools for relieving shear stresses under metatarsal heads in people with diabetes
Wen-Ming Chen
(University of Shanghai for Science and Technology, Shanghai Engineering Research Center for Assistive Devices, China)

- PP7-2 Hydraulic damper structure design of a novel intelligent knee prosthesis
Cao Wujing
(Institute of Rehabilitation Engineering and Technology / Shanghai Engineering Research Center of Assistive Devices / Key Laboratory of Neural-functional Information and Rehabilitation Engineering of the Ministry of Civil Affairs / University of Shanghai for Science and Technology, China)
- PP7-3 Preliminary study on ankle-foot orthosis using elastomer-embedded flexible joint
Isao Abe
(Faculty of Science and Engineering Oita University, Japan)
- PP7-4 Validity of the electric spastic ankle measure for ankle spasticity
Hiroki Ishihama
(The Eisei-kai Rehabilitation Research and Development Center, Eisei Hospital, Japan)

Workshop

5F Room 504-5

9:30-11:30 | Workshop

- WS-1 Empowering person-centred decision-making: service strategies for complex assistive technology selection
Rachael Elliott Schmidt
(Schmidt Consultancy, Australia)

Paper Presentation - PP8

5F Room 504-5

11:30-12:00 | Special Education

- PP8-1 Concurrent validity of EEG-based cognition test app and wechsler intelligence scale for children
Yung-Wen Tang
(School of Physical Therapy, Chun Shan Medical University, Taiwan)
- PP8-2 PLAY-ABLE – developing ability-based play activities for children with special needs
Daniil Umanski
(Holon Institute of Technology, Israel)

Poster Presentation - PT1 Upp-Limb

5F Room 501

- PT1-1 An easy & light weight upper limb: case report
Nadda Reecheeva
(Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand)
- PT1-2 Testing and training device for adjustability for grasping force
Kohei Ando
(Graduate School of Engineering, Nagoya Institute of Technology, Japan)
- PT1-3 Hand function recovery after a stroke with robotic training: Study on spasticity
Long Li
(Xi'an Jiaotong University, China)
- PT1-4 Improvement of a body powered functional arm prosthesis with modern technology
Akio Nakagawa
(Kobe Gakuin University, Japan)
- PT1-5 Adaptation of new silicone glove in the practical application of the skeleton type electric prosthetic hand
Hidemasa Nakamura
(Hyogo Rehabilitation Center, Robot Rehabilitation Center, Japan)

Poster Presentation - PT2 Communication

5F Room 501

- PT2-1 INDIE-WORD - An adaptable communication interface for paralyzed individuals
Daniil Umanski
(Holon Institute of Technology, Israel)

Poster Presentation - PT3 Life Support

5F Room 501

- PT3-1 Influence on personal assistance by robotic arms for individuals with severe physical disabilities
Toshinori Maruoka
(Nagoya Sangyo University, Japan)
- PT3-2 Augmentative and alternative communication using brain computer interfaces and accessibility functions of smart devices
Yosuke Fujimoto
(Endowed Research Department of Clinical Neuroengineering, Global Center for Medical Engineering and Informatics, Osaka University / Department of Neurosurgery, Kobe University, Japan)
- PT3-3 Development of BCI system for functional Substitution: Controlling robot
Jongsook Sanguantrakul
(Department of Biomedical Engineering, Faculty of Engineering, Mahidol University, Thailand)
- PT3-4 Developing Individual-specific assistive technology systems: A multi-input multi-output platform for severe quadriplegic
Yi-Feng Ko
(Department of Physical Medicine and Rehabilitation, Taipei Medical University Hospital, Taiwan)

Poster Presentation - PT4 Mobility

5F Room 501

- PT4-1 Investigation of manipulation force for wheelchair using 6-DOF force sensor
Ryoji Onodera
(National Institute of Technology, Tsuruoka College, Japan)

- PT5-1** Engaging caregivers in an outpatient clinic waiting area using healthcare virtual reality applications: An exploratory study
Loh Yong Joo
(Tan Tock Seng Hospital, Singapore)
- PT5-2** Conventional physiotherapy versus virtual reality exergames in stroke patients undergoing subacute rehabilitation in a community hospital: An assessor blinded randomized controlled pilot trial
Tham SL
(TTSH Rehabilitation Center, Singapore)
- PT5-3** Shape consideration for prolonging the lifetime of the Straight-fiber-type pneumatic artificial muscle
Akihiro Kojima
(Chuo-University, Japan)
- PT5-4** The training of eye-tracking for severely disabled using serious games
Fumihito Ito
(Shimane University, Japan)

Poster Presentation - PT6 AT Situation (Nation / Region)

- PT6-1** Development of web accessibility and mobile accessibility for disabilities in Taiwan
Yao-ming Yeh
(Department of Information Management, Kainan University, Taiwan)

Poster Presentation - PT8 Lower Limb

- PT8-1** The effectiveness and adaptation criteria of HONDA walking assistance robot for patients after total hip arthroplasty
Yusuke Tezuka
(Hyogo Rehabilitation Center, Japan)
- PT8-2** Validity of the crutch length estimation methods
Takayuki Nagasaki
(Department of Rehabilitation, Kyushu University of Social Welfare, Japan)
- PT8-3** The development of an intelligent drop foot stimulator
Chih-Wei Peng
(Department of Biomedical Engineering Taipei Medical University, Taiwan)
- PT8-4** A brand new design of 3D printing ankle foot orthosis advantages patients with neurological disease: Clinical research
Shih-Ching Chen
(Department of Physical Medicine and Rehabilitation, School of Medicine, College of Medicine, Taipei Medical University / Taipei Medical University Hospital, Taiwan)
- PT8-5** Changes in lower extremity muscle activity after fast walking in individuals with flat foot
Chu-Yuan Chiang
(Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Taiwan)