

i-CREATE 2015

International Convention on Rehabilitation Engineering & Assistive Technology

Jointly Organized by:



Singapore Therapeutic, Assistive & Rehabilitative Technologies (START) Centre



The Thailand's National Electronics and Computer Technology Center (NECTEC) is a statutory government organization under the



National Science and Technology Development Agency

Affiliated Event



 Smart Aging Expo 2015

 Int'l Symposium & Tradeshow on Assistive Technology 2015

Foreword

Into its 9th year, i-CREATe continues to provide a stage for technical exchanges and bring together advocates and professionals from across the countries to share ideas and best practices in the disabilities fields and exchange information on advanced technologies, equipment, techniques and materials applied in the field of Assistive & Rehabilitative Technology.

This conference will include a range of workshops on the types of assistive technologies available for use in education and employment. There will also be presentations by people with disabilities using technologies in their daily lives, including education, training and employment.

We are very honored to have the presence of Her Royal Highness Princess Maha Chakri Sirindhorn for the 9th consecutive year.

We are looking forward to meet you all in Singapore. i-CREATe 2015!



Prof. Pairash THAJCHAYAPONG
General Co-Chair



Prof. ANG Wei Tech
General Co-Chair

Committees

General Co-Chairs	Pairash THAJCHAYAPONG National Electronics and Computer Technology Center (NECTEC), Thailand
	Wei Tech ANG Nanyang Technological University, Singapore
Program Co-Chairs (Scientific)	Win Tun LATT Singapore Polytechnic, Singapore
	Sarun SUMRIDDETCHKAJORN National Electronics and Computer Technology Center (NECTEC), Thailand
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	Kalyana VELUVOLU Kyungpook National University, South Korea
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	Kriskrai SITTHISERIPRATIP, National Metal and Materials Technology Center (MTEC), Thailand
	Roger GASSERT Eidgenössische Technische Hochschule (ETH) Zürich, Switzerland
Student Innovation Challenge Committees	Prakasit KAYASITH Thai Health Promotion Foundation, Thailand
	Olivier LAMBERCY Eidgenössische Technische Hochschule (ETH) Zürich, Switzerland
	Jiro SAGARA Kobe Design University, Japan
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	Pensri GUNTASOPATRA National Electronics and Computer Technology Center (NECTEC), Thailand
	Robyn CHAPMAN Independent Living Centre Australia
	David Lijun JIANG Republic Polytechnic, Singapore

Committees for Publicity	Edwin Tuan Hoe FOO Nanyang Polytechnic, Singapore
	Edwin Heng Siang ONG Ngee Ann Polytechnic, Singapore
	Tai Suan TAN Temasak Polytechnic, Singapore
	William TAN Institute of Technical Education , Singapore
	Siritham NARANONG National Nanotechnology (NANOTEC), Thailand
	Jackrit SUTHAKORN Mahidol University, Thailand
Publication Co-Chairs	Pasin ISRASENA National Electronics and Computer Technology Center (NECTEC), Thailand
Conference Secretaries	Sarinya CHOMPOOBUTR National Electronics and Computer Technology Center (NECTEC), Thailand
	Vera YANG START Centre, Singapore

Plenary Session
13 Aug 2015 (Thu), 1330 - 1730hr
Nanyang Auditorium

1330 - 1400hr

Dr. Theng Yin Leng
and Director at the Centre of Healthy and Sustainable Cities (CHESS) at the Wee Kim Wee School of
Communication and Information,
Research Strategy and Coordination Unit (President's Office),
University (NTU, Singapore).

Professor
Research Director at the
Nanyang Technological

In the area of research, Professor Theng's philosophy is about doing worthwhile, scientifically-based experimental Human-Computer Interaction in understanding users and their interactions, especially for Information Systems, in her earlier research on the World Wide Web and Digital Libraries, and with recent focus on interactive systems/devices for Healthcare and Education. Her main research interest is to develop innovative tools, techniques, methods and models to assist in the design and evaluation of interactive systems/devices, making research relevant and impacting society. Professor Theng has been active as a Principal Investigator (PI), Co-Principal Investigator and Collaborator in competitive research grants outside WKWSCI from the A*Star (Agency for Science, Technology and Research), National Research Foundation (Media Development Authority), Ministry of Education (MOE) and Health Promotion Board (HPB) to name a few. From 2003 to 2015, as a PI, she has garnered a total of slightly over S\$3M as PI and about S\$2M as Co-PI and Collaborator. Professor Theng has more than 200 papers and publishes widely in top-tiered international journals and conferences

Title

Extending VETS: VETS-Plus - A Virtual Exercise Therapist System for Health Maintenance and Functional Recovery

Abstract

Worldwide and in Singapore, the population is ageing. By 2030, Singapore's elderly citizen will triple to about 900,000, or 18.7% of the total population. Consequently, there will be higher demands on medical and care needs. Thus, healthcare costs are expected to increase significantly. To meet the ageing issues, intervention programmes to help the silver population age gracefully, and live healthy lifestyles are being explored as an alternative to merely curing illnesses. This could reduce age-related disabilities and improve their quality of life. An area identified is physical activity. In fact, it is the ageing population that has the most pressing need to engage more in physical activity in reducing various age related risks. Research has shown that this trend of sedentary lifestyles among older adults is associated with greater prevalence of hypertension, diabetes mellitus and metabolic syndrome which are high risk factors that will lead to stroke and other chronic illnesses and disabilities. Therefore, there is a need for the elderly to continue to engage in exercise and other physical activities to reduce the incidences of age-related diseases and illnesses in the older adults. One major barrier to achieving compliance and intensity of exercises is the monotonous nature of repetitive rehabilitative exercises. Lack of motivation can be a significant issue. This presentation will discuss previous work on the **Virtual Exercise Therapist System (VETS)** prototype, its design justifications and empirical studies with on-going work extending VETS to include rehabilitative exercises for health maintenance and functional recovery.

1400 – 1430hr

Prof. Ian Gibson

Professor of Industrial Design, Faculty of Science Engineering & Built Environment, School of Engineering, Geelong Waurm Ponds Campus, Deakin University

Ian Gibson is Professor of Industrial Design in the School of Engineering at Deakin University. He has been working in the field of 3D Printing for around 25 years, when it was still known as Rapid Prototyping. His interests in relation to this technology are many and he has worked with artists, architects, civil, electrical, materials and mechanical engineers, biochemists, surgeons, prosthetists, and even international sportsmen. He moved to Deakin in 2014 to set up and direct the new Centre for Advanced Design in Engineering Training, which is an exciting new facility where engineers and industrial designers can work on real-world projects.

Title: The 3D printing revolution: what does it mean to assistive technologies?

Abstract: Rehabilitation engineering and assistive technologies are about devising solutions for small groups of people. In the past, much effort has focused on creating solutions that are adaptable so that they may be used by different groups with different requirements. This one-size-fits-all approach for rehabilitation devices will often mean the user must adapt to the system, which can result in sub-optimal performance, unnecessary discomfort and may even cause long-term harm. 3D printing has the capacity to provide bespoke solutions that can be designed to suit an individual user at affordable costs. This presentation will explain 3D Printing and discuss how it can provide such solutions.

1430 – 1510hr

Prof Hermano Igo Krebs

Principal Research Scientist & Lecturer, Massachusetts Institute of Technology

Adjunct Professor, University of Maryland, School of Medicine

Visiting Professor, Fujita Health University, School of Medicine

Visiting Professor, Institute of Neuroscience, Newcastle University

Dr. Hermano Igo Krebs joined MIT's Mechanical Engineering Department in 1997 where he is a Principal Research Scientist and Lecturer – Newman Laboratory for Biomechanics and Human Rehabilitation. He also holds an affiliate position as an Adjunct Professor at University of Maryland School of Medicine, Department of Neurology and as a Visiting Professor at Fujita Health University, Department of Physical Medicine and Rehabilitation and at Newcastle University, Institute of Neuroscience. He is one of the founders and member of the Board of Directors of Interactive Motion Technologies, a Massachusetts-based company commercializing robot technology for rehabilitation. He is a Fellow of the IEEE (Institute of Electrical and Electronics Engineers). Dr. Krebs was nominated by two of IEEE societies: IEEE-EMBS (Engineering in Medicine & Biology Society) and IEEE-RAS (Robotics and Automation Society) to this distinguished engineering status "for contributions to rehabilitation robotics and the understanding of neuro-rehabilitation." Dr. Krebs has published and presented extensively on stroke rehabilitation related issues (over 200 publications). He serves as the Associated Editor of IEEE-Transactions on Neural Systems and Rehabilitation Engineering (since 2002), as the Head of the Special Interest Group in Robotics of the World Federation for NeuroRehabilitation (since 2010). His work goes beyond Stroke and has been extended to Cerebral Palsy for which he received "The 2009 Isabelle and Leonard H. Goldenson Technology and

Rehabilitation Award,” from the Cerebral Palsy International Research Foundation (CPIRF). His goal is to revolutionize the way rehabilitation medicine is practiced today by applying robotics and information technology to assist, enhance, and quantify rehabilitation.

Robotic Assistive Steppers for Locomotor Training: Trotting Back to the Starting Gate

Abstract not available at time of print

1510 – 1550hr

Prof. Etienne Burdet
Chair in Human Robotics
Imperial College London, United Kingdom

Dr. Etienne Burdet is Professor of Human Robotics in the Department of Bioengineering at The Imperial College of Science, Technology and Medicine. He is also a visiting Professor at Université Paris VI and at University College London. He holds an MSc in Mathematics (1990), an MSc in Physics (1991), and a PhD in Robotics (1996), all from ETH-Zürich. He was a postdoctoral fellow with TE Milner from McGill University, Canada, JE Colgate from Northwestern University, USA and Mitsuo Kawato of ATR in Japan. Professor Burdet’s group uses an integrative approach of neuroscience and robotics to: i) investigate human motor control, and ii) design efficient systems for training and rehabilitation, which are tested in clinical trials.

Neuroscience-Based, Practical Rehabilitation of Hand Function

Impressive rehabilitation robots have been developed in the last decades. However, such robotics are still not commonly used for neurorehabilitation within clinical settings or in a patient’s home environment. To address the rehabilitation needs of the increasing number of individuals affected by neurological diseases, we investigate practical technological solutions for neurorehabilitation based on neuroscience and patient-centric design. This talk will present three aspects of this research: i) Sensor-based tools and signal processing techniques to develop evidence-based assessment of the sensorimotor condition; ii) Simple rehabilitation devices for training hand function that can be used from a patient’s hospital bedside to their home; iii) Robot-aided investigation of neural mechanisms of motor learning and recovery.

1620 – 1700hr

Prof. Dr.-Ing. Robert Riener
Sensory-Motor Systems Lab, IRIS
ETH Zurich, Switzerland

Robert Riener is full professor for Sensory-Motor Systems at the Department of Health Sciences and Technology, ETH Zurich, and professor of medicine at the University Hospital Balgrist, University of Zurich. Robert Riener studied Mechanical Engineering at TU München, Germany, and University of Maryland, USA. He received a Dr.-Ing. degree in Engineering from the TU München in 1997. He performed postdoctoral work from 1998-2003 at the Centro di Bioingegneria, Politecnico di Milano, and at TU München, in the field of biomechatronics. Since 2003 he is professor at ETH Zurich and university of Zurich working rehabilitation robotics, virtual reality and human motor learning. Riener has published more than 400 peer-reviewed journal and conference articles, 20 books and book chapters and filed 20 patents. He has received 18 personal distinctions and awards including the Swiss Technology Award in 2006, the IEEE TNSRE Best Paper Award 2010, and the euRobotics Technology Transfer Awards 2011 and 2012.

Rehabilitation Robotics: The Next Generation

Abstract not available at time of print

Workshop Sessions

Workshop 1

12 August 2015 (Wed), 1330 – 1730hr (Tea Break 1500 – 1530hr)

Use of 3D printing to Support Assistive Technology

3D Printing has been recognised as useful for medical applications for more than 20 years. However, it is still not routinely used in Assistive and Rehabilitation Technology practice. The recent upsurge in interest in 3D Printing has often focused on medical applications and it is anticipated that the general public will want to know why it is not more common. This presentation will try to address the difficult journey that new technologies like 3D Printing face when and explain the numerous obstacles that it has faced and may face in the future. If we are able to overcome these obstacles, we may be able to reach our vision of the future.

About the trainers

Prof Ian Gibson, Professor of Industrial Design Deakin University Australia has been working in the field of 3D printing for more than 20 years, when it was still known as Rapid Prototyping. He was part of the first Rapid Prototyping research group at Nottingham University in the UK and took this on to Hong Kong University, the National University of Singapore and now Deakin University. He is responsible for numerous initiatives in the field, including the Rapid Prototyping Journal, the book 'Additive Manufacturing: from Rapid Prototyping to Direct Digital Manufacture', and the Global Alliance of Rapid Prototyping Associations. He has researched and published widely, with over 110 cited publications in many fields. His work in the medical arena includes 3 patents for medical implant technology, the John Wiley book 'Medical Applications for Advanced Manufacturing Technology' and cited work in tissue engineering, medical use for 3D Printing (including clinical cases), and modeling of complex dynamic movements of the spine. This puts him in an excellent position to commentate on the use of 3D Printing as a solution to medical problems.

Dr. Kavin Karunratanakul is a researcher at medical device laboratory of National Metal and Materials Technology Center (MTEC), Thailand. He was part of Skeletal Tissue Engineering group at KU Leuven, Belgium. Construction of 3D tissue engineering scaffold using 3D printing technology is one of the topics explored in the research group. He was responsible for the biomechanical aspect of the full system, i.e. the combination of scaffold and fixation, and the load distribution within a scaffold. At MTEC, he is part of the team that focus on using 3D printing technology in medical application. Under close collaboration with medical doctors from different fields, the team provide solutions for many difficult cases, especially for skull and CranioMaxillofacial surgery, throughout the country. As a team, with more than 10 years of experience, they provide 3D printed implants for more than 1,400 cases."

Dr. Pasu Sirisalee is a senior researcher at medical devices lab at National Metal and Materials Technology Center (MTEC), Thailand. He got Ph.D. from the Cambridge Engineering Design Centre, University of Cambridge, UK. At MTEC, he works in various projects in a wide range of medical device's product development such CT scanner, digital x-ray machine, patient lift, surgical tools. He's now interested in the new product development of rehabilitation equipment and assistive device by utilising 3D printing technology, which is a core technology of MTEC's medical device lab.

Workshop 2

12 August 2015 (Wed), 1330 – 1500hr

Selecting Appropriate Seating for Wheelchair Users : Science and Practice

This workshop will focus on the science behind wheelchair seating. We'll look at the design and materials used in cushions and how this affects their ability to provide postural support and skin protection. We'll investigate methods of skin protection in wheelchair seating including loading techniques, material choice and design shapes. Best practice for desired postures will be discussed. We'll also address balancing postural desires with functional realities.

Workshop 3

12 August 2015 (Wed), 1530 – 1700hr

Evaluation For Power Wheelchairs -Maximizing your Client's Function and Success

Mobility is an innate human desire. You must have mobility to be included. For some clients, this can only happen through powered mobility. This program is designed to provide strategies to those involved in the assessment and prescription of power wheelchair technology. The discussion will focus on wheelbase selection, powered seating options and electronics/ drive input selection. It will include the assessment process determining those appropriate for power mobility, and selecting the appropriate components to maximize success. We'll discuss clinical implications of power seat functions as well as alternate drive controls for more complex clients. We'll use case studies to cement understanding. If you have an interest in powered mobility, if you would like to get more familiar with power wheelchairs, and learn more about how to successfully prescribe powered mobility for your clients, this is the workshop for you!

About the trainer

Ms Amy Bjornson, PT, ATP, SMS, Clinical Education Manager Sunrise Medical, Australia is trained as a Physical Therapist in the United States, Amy has over 20 years' experience as a physical therapist working with the adult and paediatric neurologic populations, with specialties in the treatment of spinal cord injury, and evaluation and provision of assistive technology for clients with physical challenges. She was the director of the Seating and Mobility Clinic in Boston, MA USA and provided consultation services to the United Cerebral Palsy Foundation. Published works include contributions to "Health Officers Guide to Treatment of Spinal Cord Injured" and "Treatment of Traumatic Brain Injury"

Amy came to Sunrise Medical – North America in 2000 as an Account Representative and joined the Education Department in 2002. She joined Sunrise-Australia in July 2007 as a Clinical Education Manager to provide and enhance professional education, training and consultation regarding wheelchair seating and functional mobility throughout Asia Pacific.

Amy is a dynamic speaker who has lectured extensively on seating and mobility, wound management and the physical therapy treatment of spinal cord injured clients. She has also travelled to several developing countries, learning and sharing information with their medical communities including Vietnam, China, India, Thailand and Mongolia. Amy received her ATP certification in 1995, SMS certification in 2015, is a friend of NRRTS and a member of RESNA

Workshop 4
13 August 2015 (Thu), 0900 - 1030hr

Developments, Outcomes and Evaluations of our Consumer Capacity projects

Participants gain an understanding of the Consumer Empowerment Framework coming into the new Assistive Technology (AT) provision framework for people with disabilities in Australia. Participants will also have a recap of and understand the progress of the two projects of the Independent Living Centre of NSW aimed at building consumer capacity: Factors to Consider and AT Mentors. The preliminary results from the "Factors to Consider Workshops" will be presented as will the preliminary evaluation results of the AT Mentors Project.

About the trainer

Ms Robyn CHAPMAN B.App.Sc (Phty) is the Chief Executive Officer, Independent Living Centre NSW. Robyn has 35 years of experience in the health, disability and ageing service delivery sectors in NSW, Australia as a Physiotherapist, in administration, in teaching and in systemic advocacy. Robyn several systemic and research advisory roles being a member of: EnableNSW Advisory Council; the UNSW Dementia Research Centre; the USyd Consultative Group (Discipline of Occupational Therapy); the AT Collaboration. Robyn has led the Independent Living Centre NSW through significant change, including the need to embrace a web based model as an integrated model of information service delivery on AT.

Workshop 5
13 August 2015 (Thu), 0900 - 1030hr

Assistive Technology (AT), the AT Delivery Process and Outcomes for people with CP and Multiple Disabilities: Our Experience at Cerebral Palsy Alliance Singapore (CPAS)

Assistive Technology (AT) plays a vital role in the lives of people with disabilities. Based on the experience of a team of Allied Health Professionals at a Singaporean Voluntary Welfare Organisation (VWO), the presentation seeks to share with participants the more common Assistive Technology (AT) devices that have been found useful by people with Cerebral Palsy (CP) and Multiple-Disability in the areas of Positioning / Mobility / AAC / ADL / Computer Access / Environmental Control / Recreation, the in-house processes that have been developed to deliver AT effectively at the centre, and the outcomes achieved thus far.

The Assistive Technology (AT) Delivery Process at Cerebral Palsy Alliance Singapore (CPAS) is multi-disciplinary in nature. The complexity of cases seen at CPAS necessitate the combined expertise of Occupational Therapists (OTs), Physio-therapists (PTs) and Speech and Language Pathologists (SLPs) in conducting accurate assessments, making appropriate recommendations and developing useful intervention strategies. Often, a Social Worker's involvement is also crucial when AT equipment is eventually obtained for home use. Through the sharing of in-house processes that have been developed for AT delivery, the presentation seeks to highlight how the various disciplines can work effectively and efficiently together to bring AT to those with Cerebral Palsy and/or multiple disability and make a meaningful difference to their lives.

About the trainers

Mr. Lee EK is a qualified Speech and Language Pathologist (SLP) who has obtained Full Registration with the Singapore Allied Health Professions Council (AHPC). He has been practising at Cerebral Palsy Alliance

Singapore (CPAS) since 2009 where he manages a caseload of clients diagnosed with cerebral palsy, autism spectrum disorder, developmental delays, multiple disability or congenital syndromes, aged between 5 to 35 years old.

His clinical responsibilities include the provision of Assistive Technology (AT) consumer-related services amounting to at least 50% of his total working hours per week, in addition to meeting the needs of clients with articulation, language, literacy, and/or swallowing issues. He is an integral part of the Assistive Technology (AT) Clinic team at CPAS – comprising Occupational and Physio-Therapists - that performs assessment and evaluation services, develops intervention strategies, and implements intervention at the monthly Assistive Technology Clinics, and conducts training programs on the use of AT for teachers and caregivers. The AT services he provides pertain mainly to the areas of Augmentative and Alternative Communication (AAC), as well as computer access, environmental modification, and technology for children with learning difficulties. Mr. Lee is certified as an Assistive Technology Practitioner (ATP) by Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), and has acquired advanced clinical skills in Neuro-Development Treatment (Paediatrics) in the course of his work.

Ms. Maureen Tesico is a senior Occupational Therapist with more than 12 years' experience with specialization in Neuro-Developmental Treatment (Adult Hemiplegia and Pediatrics). She handles a caseload of 30 clients per week on an average. Her clients are mainly from the Adult Programme such as those in Sheltered Workshop. The clients' age ranges from 18 to 60 years, diagnosed with cerebral palsy and other related physical disabilities, autism spectrum disorder, developmental disorders, intellectual and multiple disabilities. OT intervention provided to them focuses on pre-vocational and vocational skills assessment and training while trying to support and enhance clients' interests to help them improve their task coping and productivity skills.

She is valued member of CPAS Assistive Technology (AT) Clinic team that performs assessment and recommendation of suitable AT devices to clients who have difficulties performing Basic and Instrumental Activities of Daily Living. She also trains parents, caregivers and teachers in the use of such devices. As a Senior Occupational Therapist, she spends most of her working hours supervising newly recruited staff and mentoring junior staff in the Occupational Therapy department besides fulfilling her clinical responsibilities. She also provides supervision to OT students placed in the department for clinical attachment. She has been working in CPAS since July 2002.

Workshop 6

13 August 2015 (Thu), 1100 - 1230hr

Multifaceted use of an iPad for Speech Language Intervention in a SpEd setting

The utility of an iPad as an Assistive Technology device in facilitating speech and language intervention is being increasingly recognized by professionals and parents alike. It is poised to become an all – encompassing assistive device which can be used in a special education classroom setting. In this context, the workshop looks to share and increase awareness on the use of an iPad as a comprehensive communicative tool that enables a clinician and teacher to work together in targeting multiple domains of speech, language and communication. Through a few working examples, the workshop shall focus on pre-requisite skills and challenges that a client and/or communication partner faces in using an iPad or even choosing an application on an iPad. The workshop aims to stimulate holistic ideas of solving and managing practical problems encountered while using an iPad for speech, language and communication purposes, with emphasis on a classroom setting.

Learning Objectives

- To learn about the use of an iPad across the domains of Speech, Language and Communication.
- To obtain an overview of domain specific Apps for Speech Language Intervention.
- To examine the pre-requisite skills necessary for use of an iPad and its Apps.
- To identify the challenges of using an iPad and its Apps in a SPED setting.
- To gain tips to counter the challenges of using an iPad and its Apps in a SPED setting.

About the trainers

Mr. Varun Uthappa A. G., currently working as a Speech-Language Pathologist at CPAS, is a post-graduate in Speech-Language Pathology (2011) and graduate in Speech-Language Pathology and Audiology (2009) from the All India Institute of Speech and Hearing, University of Mysore, India. He has worked in both clinical and research capacities. In his clinical career as an SLP, he has served a wide variety of communication disorders across ages, such as Specific Language Impairment, Autism Spectrum Disorders, Intellectual Disability, Dyslexia, Global Developmental Delay, Fluency disorders, Voice disorders, Hearing Impairment, Cleft Lip and Palate, Cerebral Palsy, Aphasia, Speech sound disorders, and multiple disabilities, in university clinic, hospital and special school settings. His experience with AT spans across the fields of speech-language pathology and audiology. At CPAS, he is involved in the Early Intervention Program for Infants and Children through the trans-disciplinary approach of service delivery, which encompasses the application of AT for speech and language services inside the classroom.

Ms. Archana Sailesh is currently working as a Speech-Language Pathologist (SLP) at the CPAS, is a graduate in Speech Pathology from Flinders University, South Australia. She presently manages a caseload of clients with diagnosed with cerebral palsy, autism spectrum disorder, developmental delay, multiple disabilities or congenital syndrome, age between 5 to 18 years of age. Her clinical responsibilities include the provision of Assistive Technology (AT) related services to at least 50% of her client population, in addition to meeting to the needs to clients with articulation, language, literacy and/ or swallowing issues. She is a part of the Assistive Technology (AT) loan project at CPAS. This project provides assistive technology equipment on a loan or trial basis to clients, in order to facilitate generalization of skills from school to home environment. She has also completed a certification in the Fundamentals Course in Assistive Technology by Rehabilitation Engineering and Assistive Technology Society of North America (RESNA).

Workshop 7

14 August 2015 (Fri), 0900 to 1230hr

Assistive Technology Tools in the Classroom for: Communication, Self-Regulation, Work Skills, Social Skills and Academics

The workshop will cover simple Assistive Technology that can be used in any classroom for any student no matter what the disability. We will cover the choices available, correct set-up and implementation, correct assessment of tools to be used and ideas and activities for continued use throughout the school life. We will also be discussing on how to implement Assistive Technology in to a school system, ongoing training for teachers/therapists so that your students/clients will always have the latest technology and thinking available.

Areas covered will be: Communication, Access, Computer Access, Environmental Control, iPhone/iPad/mobile device access and using these devices for communication.

Target Audience: Beginner to Intermediate, those wishing to learn about simple Assistive Technology, how to use correctly and ways to get the best from technology for students.

About the trainer

Mr Paul Thompson has worked within the Assistive Technology industry for over 15 years, working in the fields of Dyslexia, Blindness/Low Vision and the more complex disabilities where access and communication are challenges. Having worked in many differing environments across the globe Paul understands the differing needs and wants that economic conditions dictate, and is able to offer a unique perspective that any teacher/therapist/caregiver can learn from and take back to their own environment. Paul has trained and

presented at hundreds of venues and has recently been invited to present to the UNICEF board on how to implement an Assistive Technology policy across many countries. However Paul's main aim and interest is still to help ensure that the caregiver has the knowledge to ensure those who need technology get the right technology and have the systems to ensure it's used correctly.

Paper Presentations

P1 – Augmentative & Alternative Communication (AAC) /
Blind & Low vision
12 Aug 2015 (Wed), 0900 – 1030hr

P1.1 0900 to 0915	<p>The Preliminary Study of Validating Vocabulary Selection for Thai Minspeak Software</p> <p>*Sarinya CHOMPOOBUTR , *Monthika BORIBOON, *Wantanee PHANTACHAT, * Krit KOSAWAT, **Puttachart POTIBAL</p> <p>*National Electronics and Computer Technology Center, Thailand; Kasetsart University, Thailand**</p>
P1.2 0915 to 0930	<p>Directional Obstacle Warning Device Using Multiple Ultrasonic Transducers for People with Visual Disabilities.</p> <p>*Surapol VORAPATRATORN, ** Kulthida TEACHAVORASINSKUN, ***Nacha CHANWARAPHA, *Atiwong SUCHATO , *Proadpran PUNYABUKKANA</p> <p>*Faculty of Engineering Chulalongkorn University Bangkok, Thailand; **Faculty of Architecture Chulalongkorn University Bangkok, Thailand, ***Faculty of Medicine Siriraj Hospital Mahidol University Bangkok, Thailand</p>
P1.3 0930 to 0945	<p>Development of an Assistive Stereo Vision System</p> <p>Tanmay SHANKAR, Abhijat BISWAS, Venkat ARUN</p> <p>Indian Institute of Technology Guwahati, India</p>
P1.4 0945 to 1000	<p>A Robotic Telepresence System for Full-Time Monitoring of Children with Cognitive Disabilities</p> <p>*TEE KIT TSUN Mark, *Bee Theng LAU, *Hudyjaya SISWOYO JO, **Sian Lun LAU</p> <p>*Swinburne University of Technology Sarawak Campus, Malaysia; **Sunway University, Malaysia</p>
P1.5 1000 to 1015	<p>Development of a low-cost, portable, tablet-based eye tracking system for children with impairments</p> <p>*Harshita KARAMCHANDANI, *David HOBBS, ** Tom CHAU, **Leslie MUMFORD</p> <p>*Flinders University, Australia; **Holland Bloorview Kids Rehabilitation Hospital, Toronto</p>
Po1.1 1015 to 1020	<p>Development of Voice Navigation and Talking Map System for the Visually Handicapped</p> <p>Wai Ming KONG, Shao SHI, Tsu Soo TAN</p> <p>Nanyang Polytechnic, Singapore</p>

Po1.2 1020 to 1025	Situation of communication aids for amyotrophic lateral sclerosis patients in Japan IMURA, Tamotsu Chubu gakuin University, Japan
Po1.3 1025 to 1030	Usage of Communication Aid by People with Severe Impairment and its Challenge *Fumihito ITO, **Satoshi KIKUTA, * Masahiko NAWATE *Shimane University, Japan **Ministry of Education, Sri Lanka

P2 – Environmental Control / Computer Access
12 Aug 2015 (Wed), 0900 – 1130hr

P2.1 0900 to 0915	Problems in using Home Appliances by Elderly Persons who live alone in Japan and some Design Proposals *Jiro SAGARA, **Rumi TANEMURA, **Kazue NODA, **Toru NAGAO *Kobe Design University, Japan, **Kobe University, Japan
P2.2 0915 to 0930	Development of the Bio-Remote Adaptive Human Interface with Novel Glasses-based Operation **^Go NAKAMURA, #Akitoshi SUGIE, ^Taro SHIBANOKI, ***Keisuke SHIMA, ##Yuichi KURITA, *#Takaaki CHIN, ###Toshio TSUJI *Robot Rehabilitation Center in Hyogo Rehabilitation Center; #The Hyogo institute of Assistive Technology; ^Graduate School of Engineering, Hiroshima University; **College of Engineering, Ibaraki University; ***Faculty of Engineering, Yokohama National University; ##Institute of Engineering, Hiroshima University
P2.3 0930 to 0945	Multimodal Gait Training and Evaluation using Smartphone *Aung Aung PHYO WAI, #Lijung JIANG, **Zihao WANG, **Sim Heng ONG *Institute for Infocomm Research, Singapore; **National University of Singapore, Singapore; #Republic Polytechnic, Singapore
P2.4 0945 to 1000	Wireless Multimodal Sensory Headband for Personalized Relaxation Management *Weiqi Victor HUANG, *Zhi-En Samuel Joshua CHEW, *Yan Kai Brandon FOONG, #Aung Aung PHYO WAI, *Sher-Yi CHIAM *NUS High School of Science and Mathematics; #Institute for Infocomm Research, Singapore

P2.5 1000 to 1015	Redundancy Effect of Word-Picture-Object for Mobile Learning in Rich Physical Environment Yootthapong TONGPAENG, Pradorn SUREEPHONG Chiang Mai University, Thailand
Po2.1 1015 to 1020	NRC Glass: Glasses-Type Assistive Service for People with Mild Cognitive Impairments Won-Kyung SONG; Yuri KIM; Seong Pil KIM Korea National Rehabilitation Center, South Korea
Po2.2 1020 to 1025	Bowl-Holder for children using myoelectric hand *#Yuichiro HONDA, #Yuji HAMAMOTO, *#Takaaki CHIN, *#Yaeko SHIBATA, *#Futoshi MIZOBE, **Hidemasa NAKAMURA, **Mitsuru IRIE *Robot Rehabilitation Center in the Hyogo Rehabilitation Center, #Hyogo Institute of Assistive Technology, **Department of Electronics, Information and Communication Engineering, Osaka Sangyo University

**P3 – Mobility Aids / Robotics / Prostheses & Orthoses
12 Aug 2015 (Wed) 1100 – 1230hr**

P3.1 1100 to 1115	Preliminary Study of a Four-axis Force/Torque Sensor and its calibration machine for an Assistive Robot Arm *Dong-Lin TSAI, **Yu-Jen WANG, #Chun-Chieh WANG, #Wei-Der CHUNG, ##Paul C.-P CHAO, **Cheng-Tang PAN *National Taipei University of Technology, Taiwan; **National Sun Yat-sen University, Taiwan; #Industrial Technology Research Institute, Taiwan; ##National Chiao Tung University, Taiwan
P3.2 1115 to 1130	A Hybrid Assistive Wheelchair Exoskeleton Tanmay SHANKAR, Santosh Kumar DWIVEDY Indian Institute of Technology Guwahati, India
P3.3 1130 to 1145	Phase Detection and Foot Drop Prevention for the Novel Powered Ankle Foot Orthosis System Thanh Trung NGUYEN Shibaura Institute of Technology, Japan

P3.4 1145 to 1200	A Simple Biomechanical Analysis and Rotary Motor Design of a Lower-Limb Exoskeleton for Sit-to-Stand Movement Leonardo Paul MILIAN, Alex ANCHIVILCA, Diego VASQUEZ, Reynaldo DIBURGA, Ebert CHOQUEHUANCA, Mirna AMPUERO Universidad Nacional de Ingenieria, Peru
P3.5 1200 to 1215	Study of a Novel Center-driven Robot for Upper Limb Rehabilitation WuJing CAO, HongLiu YU, JinHua YI, YouFang FANG University of Shanghai for Science and Technology, China
Po3.1 1215 to 1220	Automatic Bed Posture Control System for Caring Long-term Bedridden Persons with Disability *Seokjin HWANG, *Ju-hwan BAE, *#Inhyuk MOON * Department of Intelligence System, Graduate School of Dong-Eui University; *#Department of Mechatronics Engineering, Dong-Eui University
Po3.2 1220 to 1225	Usability Assessment of a Glove Type Writing Assistive Device for People with Spinal Cord Injury *Myungjoon LIM; *Hyosun KWEON, *Jiyoung PARK, *Kuem Ju LEE, #Byungchul KIM, #Kyujin CHO, *Hyun CHOI *Korea National Rehabilitation Research Institute, Korea, Republic of (South Korea); #Dept. Of Mechanical Engineering, Seoul National University, Republic of Korea

**P4 - Neurorehabilitation Technology /
Research and Assessment on Games
12 Aug 2015 (Wed), 1100 - 1230hr**

P4.1 1100 to 1115	Gamification in classroom, effect of categorization of extrinsic reward to motivate student learning performance *Suepphong CHERNBUMROONG, **Pradorn SUREEPHONG *Knowledge Innovation Research Laboratory, College of Arts, Media and Technology, Chiang Mai university, Thailand; **Knowledge Innovation Research Laboratory, College of Arts, Media and Technology, Chiang Mai university, Thailand
P4.2 1115 to 1130	Effects of an Intelligent Robot on Number of Words and Length of Sentences uttered by Children with Autism *Lee, Yu Lim, **Kwon, Jungmin, ***Kim, Young Tae, *Shin, Soo-Jung *Ipbook Elementary School, **Seoul National University of Education, Korea, Republic of (South Korea) ***Ewha Womans University

<p>P4.3</p> <p>1130 to 1145</p>	<p>fNIRS-based analysis of temporal changes of brain activation during long-term conditioning with functional electrical stimulation</p> <p>*Misato OHDAIRA, **Tomoko KAMISAWA, #Soichiro MORISHITA, #Yinlai JIANG, *Masao SUGI, #Osamu YAMAMURA, *#Hiroshi YOKOI</p> <p>*The university of electro-communications, Japan; **Fukui-Ken Saiseikai Hospital; #The Brain Science Inspired Life Support Research Center, The University of Electro-Communications; ##Second Department of Internal Medicine University of Fukui</p>
<p>P4.4</p> <p>1130 to 1145</p>	<p>Application of Reaction Force for Balance Training and Active Rehabilitation</p> <p>Makoto HARAGUCHI</p> <p>Fukui University of Technology</p>
<p>P4.5</p> <p>1130 to 1145</p>	<p>Local Circular Modeling based Real-time Pathological Tremor Characterization for FES Applications</p> <p>*Sivanagaraja TATINATI, *Yubo WANG, *Kalyana Chakravarthy VELUVOLU, **Wei Tech ANG</p> <p>*Kyungpook National University, Korea, Republic of (South Korea); **Nanyang Technological University, Singapore</p>
<p>P4.6</p> <p>1145 to 1200</p>	<p>A Simulation Study on Nerve Block by Electrical Stimulation with High Frequency</p> <p>Bin ZHANG, Pete SHULL, Dingguo ZHANG</p> <p>State Key Laboratory of Mechanical System and Vibration, Shanghai Jiao Tong University, China</p>
<p>Po4.1</p> <p>1200 to 1205</p>	<p>Designing Games for Individuals with Autism Spectrum</p> <p>Swati GUPTA</p> <p>Callaghan Innovation, New Zealand</p>

Student Innovation Challenge @ i-CREATe 2015

The 8th Student Innovation Challenge (**SIC**) is an annual event held at the International Convention on Rehabilitation Engineering and Assistive Technology (**i-CREATe**). It provides a platform to encourage students from all over the world to compete with one another in developing creative and innovative devices or solutions to **improve the quality of living of elderly and people with disability, and to improve the quality of professional practice in rehabilitation**. It showcases the extraordinary talents of these students while providing them the opportunity to work with clients and clinicians to develop these innovative ideas. There are 2 categories in this challenge.

Design Category

Students are expected to apply **User-Centered Design** process to produce a solution that 'makes life easier' for its users or enhance the user experience (UX) or improves the quality of professional rehabilitation practice. The solution may or may not be technology based.

Technology Category

Students are expected to apply principles in **Engineering and Information Technology** to design and implement Assistive & Rehabilitation Technology solution to address the issues/problems faced by the needy, their caregivers and clinicians. The solution must have engineering or technological component(s).

There are 2 rounds of judging:

Oral Presentation

Date / Time: 11 August 2015 (Tue), 1300 to 1800hr

Format: A 5-minutes computer and/or video presentation key idea(s) of the project, followed by a 2-minutes Q&A.

Prototype Judging

Venue : Nanyang Auditorium, Foyer

Date / Time: 12 August 2015 (Wed), 1100 to 1730hr

Format : A 5-minutes demonstration of prototype followed by a 2-minutes Q&A.

A panel of international judges of different professional backgrounds will be invited to judge on the projects. All judges' score based on the judging criteria will carry equal weight and decision of the winners need not be unanimous.

The judges will select the top three teams as well as two teams that deserve merit in each category.

Gold – USD 1,400.00, a trophy and certificates for all members.

Silver – USD 700.00, a trophy and certificates for all members.

Bronze – USD 350.00, a trophy and certificates for all members.

Merit Award - a trophy and certificates for all members.

Best presentation award - A trophy and certificates for all members

The award will be decided by the panel of judges based on the presentation part of the judging criteria.

Best poster award - A trophy and certificates for all members

The award will be decided by the panel of judges based on the poster part of the judging criteria.

Best prototype/Ergonomic award - A trophy and certificates for all members
The award will be decided by the panel of judges based on the prototype part of the judging criteria.

Peer's choice award - A trophy and certificates for all members
The award is to be decided by the SIC participants. Each team is allowed to cast one vote on the most deserving team entry but cannot vote for themselves.

Public's choice award - A trophy and certificates for all members
The award is to be decided by the delegates attending the conference

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