

The logo for i-CREATE 2008 features a large, stylized golden letter 'A' that serves as a background for the text. The text 'i-CREATE' is in a blue, sans-serif font, with a small 'e' at the end, and '2008' is in a smaller blue font to the right.

i-CREATE²⁰⁰⁸

The title text is arranged in a vertical stack on the left side of the page. It includes the word 'International' in a smaller blue font, followed by 'Convention on Rehabilitation Engineering & Assistive Technology' in a larger blue font, and '2008' in the largest blue font. The background behind the text is a faded image of a golden stupa.

International
**Convention on
Rehabilitation
Engineering &
Assistive
Technology
2008**

The event details are listed in a blue, sans-serif font. The dates '13 - 15 May' are on the first line, followed by the location 'Imperial Queen's Park Hotel' and 'Bangkok, Thailand' on the next two lines.

13 - 15 May
Imperial Queen's Park Hotel
Bangkok, Thailand

The ISBN number is displayed in a blue, sans-serif font.

ISBN 978-981-08-0368-1

The words 'CONFERENCE' and 'GUIDE' are written in a large, bold, blue, italicized sans-serif font, stacked vertically.

***CONFERENCE
GUIDE***

A light blue rectangular button with rounded corners containing the word 'Welcome' in a dark blue, sans-serif font.

Welcome

A light blue rectangular button with rounded corners containing the word 'Contents' in a dark blue, sans-serif font.

Contents

A light blue rectangular button with rounded corners containing the word 'Authors' in a dark blue, sans-serif font.

Authors

A light blue rectangular button with rounded corners containing the word 'Search' in a dark blue, sans-serif font.

Search

i-CREATE^e 2008

International Convention on Rehabilitation Engineering & Assistive Technology

13-15 May 2008
The Imperial Queen's Park Hotel
Bangkok, Thailand

Jointly Organized by:



The Singapore Therapeutic, Assistive & Rehabilitative Technologies (START) Centre

&



The Thailand's National Electronics and Computer Technology Center (NECTEC)

Technical Sponsors:



Supported by:



Official Airline:

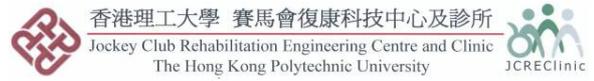


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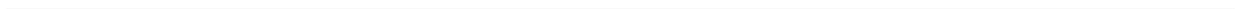


Supporting Organizations:





Professional Conference Organizer



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Welcome

Assistive and Rehabilitative Technologies (ART) are the systematic applications of scientific and engineering principles to improve the quality of life for people with disabilities.

Though the providing of technology needed to accomplish tasks that were formerly impossible or difficult to achieved, ART promote independence.

An ART device can be loosely defined as “any item, piece of equipment, or product system, whether acquired commercially off-the-shelf, modified or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.” It has been long observed that people with disabilities has increased vocational and independent living opportunities with adoption of ART.

The importance of Assistive and Rehabilitative Technology is well recognized and undeniable, and the *international Convention for Rehabilitation Engineering & Assistive Technology (i-CREATE) 2008* is organized to provide information exchange, knowledge-sharing, networking, publications of researches, and professional interactions among the end-users, practitioners, policy-makers, researchers, and manufacturers.

Jointly organized by the Thailand’s National Electronics and Computer Technology Centre (NECTEC) and the Singapore Therapeutic, Assistive & Rehabilitative Technologies (START) Centre, and supported by the Thailand Exhibition & Convention Bureau (TCEB), *i-CREATE* is held for the very first time in Bangkok, Thailand.

This year, for the very first time as well, *i-CREATE* will feature an Assistive and Rehabilitative Technology Student Design Challenge (SDC), where top student teams from regional countries convene to interact and compete for the top design awards.

We trust that you will find the carefully assembled Keynotes, Plenary Sessions, Workshops and Paper Sessions useful and we also strongly encourage you to take time to visit the exhibition booths to gather more information.

We look forward to meeting with you at *i-CREATE* 2008.



Prof. Pairash Thajchayapong
General Chair



Mr. Zen Koh
Deputy General Chair

General Information

Conference Date:	13 to 15 May 2008
Conference Venue:	The Imperial Queen's Park Hotel Bangkok 199 Sukhumvit Soi 22, Bangkok 10110 Thailand Tel: +66 (0) 2261 9000 Fax: +66 (0) 2261 9530-4
Opening Hours:	8:30 a.m. to 5:30 p.m. daily
Admission:	Open to trade and public. All visitors are to register at the Registration Counter to exchange for visitor passes.
Registration:	Queen's Park 1 Foyer, Level 2
Opening Ceremony:	Queen's Park 1, Level 2
Keynote & Plenary Sessions:	Queen's Park 1, Level 2
Workshops & Paper Presentations:	Queen's Park 4, Level 2 Queen's Park 5, Level 2 Queen's Park 6, Level 2 Saithip, Level 3
Exhibition:	Queen's Park 2 & 3 , Level 2
Lunch and Tea Break:	Queen's Park 1, Level 2
Gala Dinner:	Queen's Park 1, Level 2
Student Design Presentations:	Saithip, Level 3
Conference Contact	i-CREATe 2008 Conference Secretariat Prajaree TANTONG, Thailand Research Assistant, Assistive Technology Center (ASTECC), National Electronics and Computer Technology Center (NECTEC), Thailand prajaree.tantong@nectec.or.th Vera YANG, Singapore Program & Operation Manager, START Centre, Singapore vera_yang@start-centre.com

Session Information

All Chairpersons and Speakers are requested to be in their respective session rooms at least 10 minutes prior to the commencement of each session.

A total of 15 minutes has been allocated for each oral presentation, including time for questions (12 minutes presentation + 3 minutes question and answer.) Session chairpersons will strictly enforce this limit. Presenters are requested to keep their presentations within the time limits stated.

Presentations must be carried out using either **Microsoft PowerPoint OR Overhead Projector (OHP)**. No slide projector will be provided.

For presenters using Microsoft PowerPoint, they are encouraged to bring their files in a CD ROM or USB flash drive (thumb drive) and upload their files from **08:00 – 08:30 hrs daily, during the daily tea breaks or lunch time** directly onto the laptop or desktop computer provided in the designated room of the presentation. Presenters may also use their own laptops if their presentations require special software or codec.

Travel Information

Thailand

Thailand lies in the heart of Southeast Asia, making it a gateway to Indochina, Myanmar and Southern China. Its shape and geography divide into four natural regions: the mountains and forests of the North; the vast rice fields of the Central Plains; the semi-arid farm lands of the Northeast plateau; and the tropical islands and long coastline of the peninsula South.

Thailand is a constitutional monarchy with His Majesty King Bhumibol Adulyadej, or King Rama IX, the ninth king of the Chakri Dynasty, the present king. Thailand embraces a rich diversity of cultures and traditions. With its proud history, tropical climate and renowned hospitality, the Kingdom is a never-ending source of fascination and pleasures for international visitors. For more information on Thailand, visit <http://www.tourismthailand.org>

Bangkok

Bangkok was founded in 1782 by the first monarch of the present Chakri dynasty. It is now the country's spiritual, cultural, diplomatic, commercial and educational hub. It covers an area of more than 1,500 square kilometers, and it is home to approximately ten million people or more than 10% of the country's population.

For tourists, Bangkok has a feast of attractions to offer. The city is dotted with 400 glittering Buddhist temples of great beauty and fascination, magnificent palaces, classical dance extravaganzas, numerous shopping centers and traditional ways of life, especially along the "Venice of the East" timeless canals and the Chao Phraya River of the "River of Kings" winding through the city. It is worth taking a trip along its waters before exploring further into different canals to take a glimpse of old Bangkok.

Airport Information

Suvarnabhumi Airport is located in Racha Thewa in the Bang Phli district of Samut Prakan province, 30 kilometers east of Bangkok. It has 2 parallel runways (60 m. wide, 4,000 m. and 3700 m. long) and 2 parallel taxiways to accommodate simultaneous departures and arrivals. Please check your desired airlines of arrival and departure terminal.

After clearing customs and immigration, several modes of transportation may be found at the exits. Prices may range from Baht 700 to 1,500 on private limos or Baht 350 – 400 for regular taxis (not including Toll or express way for another Baht 60).

1 USD \approx 31.75 Baht, 1 SGD \approx 23.25 Baht, 1 USD \approx 1.36 SGD.

Population

Thais are well-known for their friendliness and hospitality. A large majority of over 62 million citizens of Thailand are ethnic Thai, along with strong communities whose ethnic origins lie in China, India and elsewhere. About 7 million people reside in the capital city of Bangkok.

People

Thai (80%), Chinese (10%), Malay (3%), and the rest are minorities (Mons, Khmers, hill tribes) Ethnic Thais form the majority, though the area has historically been a migratory crossroads, and has thus produced a degree of ethnic diversity. Integration is such, however, that culturally and socially there is enormous unity.

Language

Spoken and written Thai is largely incomprehensible to the casual visitor. However, English is widely understood, particularly in Bangkok where it is almost the major commercial language. English and some European Languages are spoken in most hotels, shops and restaurants in major tourist destinations, and Thai-English road and street signs are found nationwide.

Climate

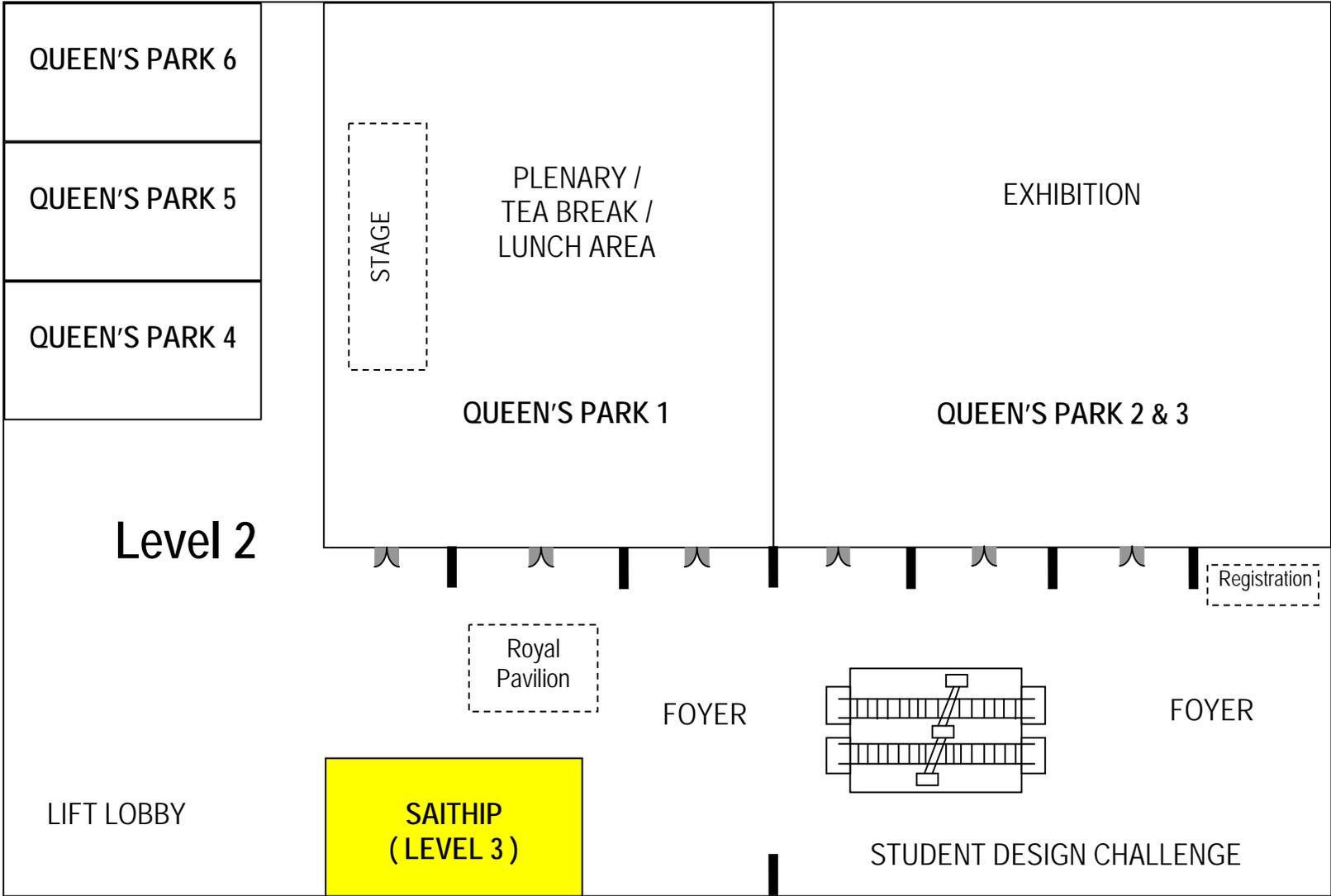
Thailand enjoys a tropical climate with three distinct seasons-hot and dry from February to May (average temperature 34 degrees Celsius and 75% humidity); rainy with plenty of sunshine from June to October (average day temperature 29 degrees Celsius and 87% humidity); and cool from November to January (temperatures range from 32 degrees Celsius to below 20 degrees Celsius with a drop in humidity).

Much lower temperatures are experienced in the North and Northeast during nighttime. The South has a tropical rainforest climate with temperatures averaging 28 degrees Celsius almost all year round.

Imperial Queen's Park Hotel, Bangkok

The Imperial Queen's Park Hotel, Bangkok is perfectly suited for both business and leisure travelers to Bangkok. The impressive 37-storey hotel comprising of two towers has over 1,250 well appointed guest rooms, a choice of seven restaurants, a spa and numerous recreation facilities and is centrally located on world-famous Sukhumvit Road near the skytrain, a luxurious shopping complex, the Emporium; Queen Sirikit National Convention Centre and the Bangkok International Trade and Exhibition Centre (BITEC).

Hotel Floor Plan



Social Programme

HALF DAY TOUR

City Tour and Temple (CODE: HF01)

Period: 8.00 – 11.30 hrs

Remark: Quoted in Thai Baht and min. 2 pax

Definitely on the "must do" list and an integral part of Thai culture include Wat Traimit which has a wonderful solid gold seated Buddha nearly 5 metres high and weighting five and a half tons. In the past, artisans crafted the Buddhas in gold and disguised them from invading armies by a covering of stucco and plaster. The Wat Po temple is actually much older than the city of Bangkok itself. It was founded in the 17th century, making it the oldest temple in Bangkok. The name Wat Po comes from its original name of Wat Potaram. King Rama I, the founder of Bangkok, enlarged the temple, installed many statues and other artefacts recovered from Ayuthaya, and renamed the temple Wat Phra Chetuphon in 1801. After that visit Wat BenjamaBorpit or Marble Temple which is constructed of marble from Carara Italy.

Royal Grand Palace and Emerald Buddha (CODE: HF02)

Period: 08.30 – 12.00 hrs

Remark: Quoted in Thai Baht and min. 2 pax

Visit one of Thailand's most revered temples, Wat Pra Kaeo (Emerald Buddha). The temple is located inside the grounds of the Grand Palace. This Royal temple contains an exquisite Emerald Buddha which dates back to around the 14th century. The robes on the Buddha are changed with the seasons by HM King of Thailand and form an important ritual in the Buddhist calendar. The Grand Palace, Bangkok's number one attraction, is quite simply stunning. Shimmering in gold, alongside the Temple of the Emerald Buddha, it represents the best in Thai traditions. Take a closer look at some of the capital's other cultural gems for an insight into this fascinating city.

HALF DAY TOUR

The Thonburi Klong Tour (CODE: HF03)

Period: 08.30 – 12.00 hrs

Remark: Quoted in Thai Baht and min. 4 pax

Travel by long-tailed speedboat on the picturesque Chao Phraya River and Klongs (canals) of Thonburi, visit the Temple of Dawn and the Royal Barges Museum. Bangkok is changing fast, but if you still want a close up of traditional Thai life, explore some of Bangkok's waterways. The network of canals (klongs) branching out from the main Chao Phraya river still follows an old lifestyle that leaves the modern face of Bangkok behind. Small interconnecting canals sustain a traditional lifestyle where mobile shops, "floating kitchens" and water taxi services ensure a local pace. While it is not difficult to hire a boat by yourself, a tour provides an insight into the lifestyle, rather than just a plain sightseeing trip. Choose a klong tour which stops at some of Bangkok's other places of interest, like the Royal Barges Museum and Wat Arun. An excellent way to get to know a special part of Bangkok. After finishing the tours, drop at MBK Shopping Center for shopping.

Damnern Saduak Floating Market (CODE: HF04)

Pick up time: 06.30 – 12.00 hrs

(Min. 2 persons incl. transportation / English speaking guide / Toll Fee / boat)

Damnernsaduak is believed to be one of a well-known and attractive traveling site. Historically, Damnoensaduak was actually the name of the canal dug in the reign of King Rama IV by the military men and the people of Rajburi, Samutsakorn and Samutsongkram Province directed by Phayasrisuriyawong, the minister of Defense. In those days without rivers and canals, transportation was almost motionless; King Rama IV with his great concern over the country's future economic growth, he finally had the canal dug to connect the Taa Chin River in Samutsakorn Province and Mae Klong River in Samutsongkram Province together.

FULL DAY TOUR

Ayudhaya 1 day Trip (CODE: FF01)

Period: 08.00 – 16.30 hrs

Remark: Quoted in Thai Baht and min. 2 pax

By coach to Ayudhaya Province, visit Bang Pa-In Summer Palace, Wat MahaThat, Wat Na Phra

Mane then take a buffet lunch on cruise to along with Chao Phaya River back to Bangkok

Program:

- 08.10 hrs Depart Bangkok to Ayuthaya, passing through many main parts of the Angel City. Along the way, you will see an agricultural country.
- 09.30 hrs Arrive at the Bang Pa-In Summer Palace, built during the Ayuthaya era. The palace is beautifully decorated in both traditional Chinese and European style. See the beautiful Aisawanthipaya- Art Pavilion, the unique Chinese-style hall with a vast collection of Thai, Chinese, and European artifacts, as well as many other outstanding monuments. The palace itself is a pretty garden with plenty of rare flowers.
- 10.45 hrs Arrive at the Ayuthaya, the Ancient city, which was the former Thai capital for over 400 years. The prosperous city used to dominate trade in Asia as well as being the center of trade between Thailand and many European countries, including Britain, France and Holland. Nowadays the glory and the beauty of the grand palace and Temples in the past vanished leaving merely a glimpse of ruins, despite this it is a good reflection of the past. River sun brings you a combination of both the ruins and the remaining historical attractions. - Wat Maha That. Over 600 years old, Wat Maha That was the heart and soul of the Ayuthaya people. It was almost completely destroyed by the Burmese during Thai- Burmese war. - Wat Na Phra Mane: Remains in perfect conditions, as it was used as the Burmese headquarters. The splendid Golden Buddha, dressed in regal attire, was place in the temple a long with the three thousand year old green stone carved Buddha. Both are considered as extremely valuable national relics. - Wat Lokayasutharam ha a mysterious past, hereby its origins are unknown. The temple enshrines a Largest Reclining Buddha Image which was built during the Early period of the Ayuthaya Region. The other two ancient temple, as well as the ruined site also surround the compound area.
- 12.30 hrs Depart Wat Lokayasutharam for the Shangri La Cruise, at the pier “ Bang Sai” Buffet Lunch: "Delicious meals served in the luxurious surroundings of the cruise boat".
- 13.30 hrs Through out the journey you are able to watch the Chao Phraya River banks scenery from the river sun Cruise, ether on deck in the fresh cool tropical air or from the refreshing air-conditioned passenger room. Either view you get an amazing ling clear view of the life of the inhabitants that dwell along the river, and the unforgettable scenery of children as they great the visitors going by, making it an altogether worthwhile experience.
- 16.30 hrs Arrive Bangkok and disembark at the Shangri La pier, and transfer you back to your hotel.

For more information about the tour packages, kindly contact:

Pan Pho Co.,Ltd.

Tel: +66 2 623-1418-9 ext 11, 17

Fax: +66 2 623-1417

E-mail: supaporn@papho.com, rommy@panpho.com

Contact: Ms. Supaporn Pumruang, Mrs. Rommayakorn Suvisit

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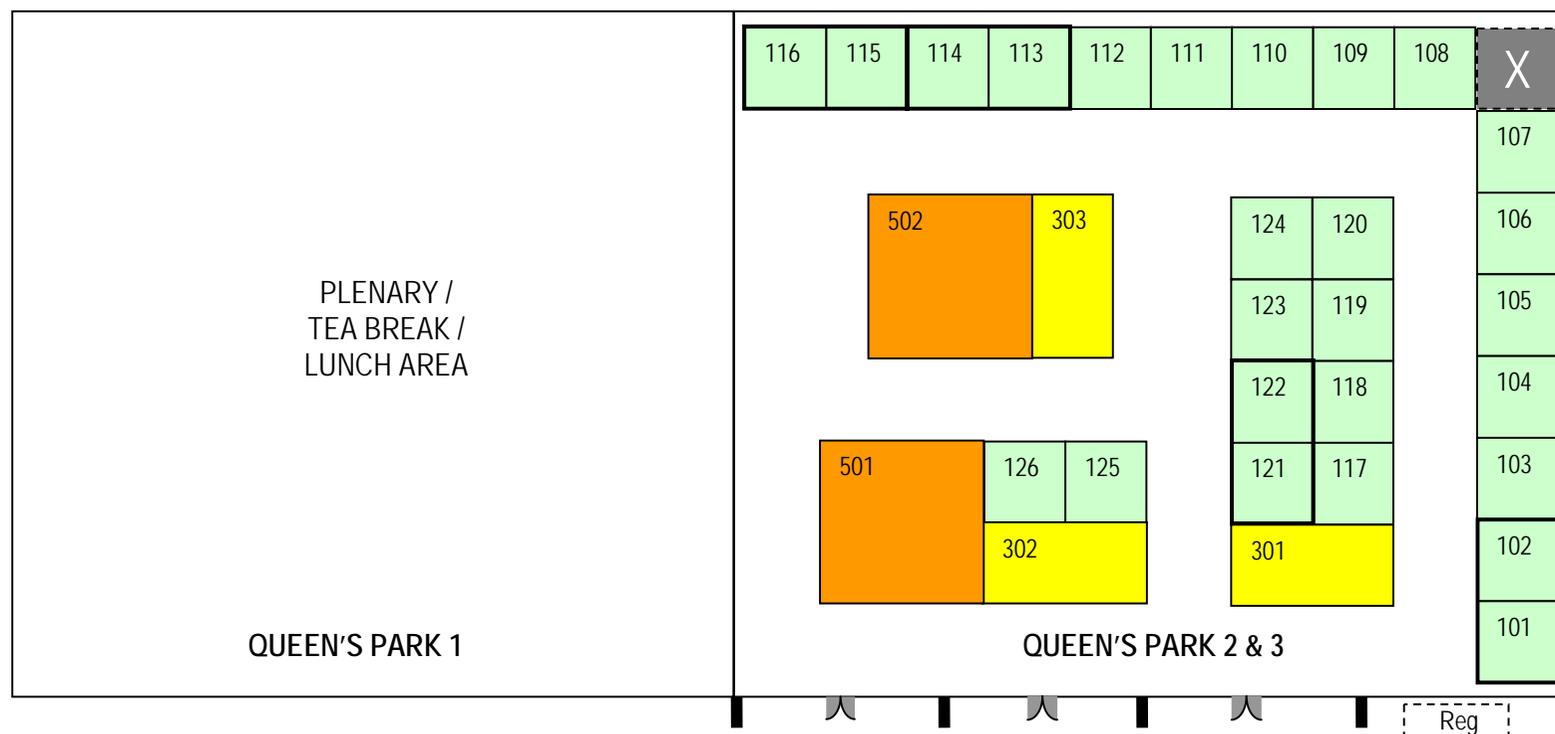
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Exhibition



101 & 102	Shinanokenshi Company Co. Ltd.	113 & 114	V.S. Engineering	124	Intimex Cochlear
103	Chuanmit Biomedical Engineering Co.	115 & 116	Modernform Health & Care Co. Ltd.	125	GW Micro Inc.
104 & 105	TBA	117	DASIY For All (DFA)	126	Klarity Medical & Equipment Co., Ltd
106	Prostheses Foundation	118	Thai Association for the Blind (TAB)	301	HumanWare-Viewplus
107	National Office for Empowerment of Persons With Disabilities	119	Disabled People International, - Asia Pacific (DPI-AP)	302	National Electronics and Computer Technology Center & Strategic Alliances
108	Rajanukul Institute	120	START Centre Pte Ltd	303	Ulrich Alber GmbH
109	Ratchasuda College	121 & 122	Liberator	501	KARMA Medical Products Co. Ltd
110 - 112	Assistive Technology for Medical Rehabilitation	123	Lab Rehab Pte Ltd	502	Otto Bock South East Asia Co. Ltd

Exhibitors	Booth
Assistive Technology for Medical Rehabilitation	#110 - #112
Chuanmit Biomedical Engineering Co. <i>The exclusive distributor of INVACARE and ROHO in Thailand.</i> 50/34 Chuanmit building Phahonyothin Road Arnusaowaree Bangkhen, Bangkok Thailand 10220 Tel: 02-9704183, 02-9704184 Fax: 02-9704185 Mobile Phone: 089-5012529, 086-8889264 Name: Gumpoj P Email: gumpoj@chuanmit.com	#103 See Advertisement
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Disabled People International- Asia Pacific <i>World cross-disability, self-help, human rights organizations of persons with disabilities established in 1981.</i> 29/486 Moo.9., Soi.12 Muangthong Thani, Bangpood, Pakkred, Nonthaburi 11120 THAILAND Tel : (662) 503-4268-9 Fax : (662) 503-4268-9 Website : http://www.dpiap.org Name: Saowalak Thongkuay E-mail : saowalak@dpiap.org	#119
GW Micro Inc. <i>Manufactures & distributes, worldwide, assistive technology solutions for blind people.</i> 725 Airport North Office Park Fort Wayne, IN 46825, USA Tel: 260-489-367 Fax: 260-489-2608 Website: http://www.gwmicro.com/ Name: Marty Hord, Director Asia-Pacific Business Development Email: marty@gwmicro.com	#125 See Advertisement
HumanWare-Viewplus <i>Provides innovative solutions, empowering people who are blind, visually impaired or learning disabled.</i> Suite 2,7-11 Railway Street Baulkham Hill NSW, 2153 Australia Tel: (02) 9686 2600 Fax: (02) 9686 2855 Website: http://www.humanware.com/en-new_zealand/home Name: Ron Hathaway, Managing Director Email: ron.hathaway@humanware.com	#301 See Advertisement

Exhibitors	Booth
<p>Intimex Cochlear</p> <p><i>The latest technology that has enabled people who are profoundly deaf to hear again or for the first time.</i></p> <p>14 Mars Road, PO Box 629 Lane Cove NSW 2066, AUSTRALIA Tel: 61 2 9428 6555 Fax: 61 2 9428 6353 Website: http://www.cochlear.com.au</p>	#124
<p>KARMA Medical Products Co. Ltd.</p> <p><i>Manufactures and distributes life enhancement products for the injured, disabled and elderly.</i></p> <p>No 2363 Sec 2, Da-Shiue Road Min-Hsiung Shiang Chia-Yi 621, Taiwan Website: http://www.karmamedical.com/k1-1.htm Name: Susan Huang Email: susan@karma.com.tw</p>	#501 See Advertisement
<p>Klarity Medical & Equipment Co., Ltd</p> <p><i>Manufactures broad variety of medical thermoplastics sold under Larson trade names, and trade names of our distributors throughout the world.</i></p> <p>3rd Floor, 1st Building, Guangzhou Sciencetech park No.9 Lan Yu 4th.R., China 510730 Tel: 86-20-82226380-601 Fax: 86-20-82088552(82221907) Website: http://www.klarity-medical.com/en/index_en.asp Email: sales@klarity-medical.com</p>	#126
<p>Lab Rehab Pte. Ltd.</p> <p><i>Aims to design functional equipment which are targeted for specific purposes and make them available at affordable prices so that patients and healthcare institutes can benefit.</i></p> <p>211 Holland Avenue #04-03, Singapore 278967 Website: http://www.lab-rehab.com/index.html Name: Ng Chee Kiat Email: Kiat@lab-rehab.com</p>	#123
<p>Liberator</p> <p><i>Part of the Prentke Romich group of companies, a global leader in effective communication for those with speech impairments.</i></p> <p>Suite 36, 239 Magill Road, "SteadFast House", Maylands, SA 5069 Australia Tel: 61 88 366 6536 Fax: +61 88 366 6501 Website: http://www.pri-liberator.com/ Name: Nigel Duckett, Managing Director Email: nigel@liberator.net.au</p>	#121 & #122 See Advertisement

Exhibitors	Booth
<p>Modernform Health & Care Co. Ltd.</p> <p><i>Provides one stop service solution for hospital and home care. Fully equipped and highly specialized in Interior Service & Turnkey Management, Layout Consultant Service, & Medical equipment & hospital furniture.</i></p> <p>699, 15th F1 Modernform Tower, Srinakarindar Road Suanluang, Suangluang Bangkok 10250, Thailand Name: Suradej Chaiwiwat Email: suradej@modernformhealthcare.co.th</p>	#115 & #116
<p>National Electronics and Computer Technology Center & Strategic Alliances</p> <p><i>Aims to undertake, support and promote the development of electronics and computer technologies through research and development activities.</i></p> <p>112 Phahon Yothin Rd., Klong 1, Klong Luang, Pathumthani 12120, Thailand Tel: 0-2564-6900 Fax: 0-2564-6901-3 Website: http://www.nectec.or.th/ Email: info@nectec.or.th</p>	#302
<p>National Office for Empowerment of Persons with Disabilities</p>	#107
<p>Otto Bock South East Asia Co., Ltd</p> <p><i>Worldwide, the name stands for high-quality and technologically outstanding products and services in Orthobionic® and Bionimobility®.</i></p> <p>1741 Phahol Yothin Road. soi 27, Chatuchak, Bangkok, Thailand -10900 Tel: +6598184803 Fax: +6567259855 Website: http://www.ottobock.com/ Name: Daryl Lim, Business Development Manager Email: Daryl.Lim@ottobock.co.th</p>	#502 See Advertisement
<p>Prostheses Foundation</p>	#106
<p>Ratchasuda College</p>	#109
<p>Shinanokenshi Company Ltd</p> <p>6-15-26, Chuo Ueda-Shi, Nagano-Ken, Japan Tel: +81.268.28.8282 Fax: +81.268.22.5476 Website: http://www.skcj.co.jp/ Name: Masato Shimizu, General Manager Email: smasato@skcj.co.jp</p>	#101 & #102

Exhibitors	Booth
<p>Singapore Therapeutic, Assistive & Rehabilitative Technologies (START) Centre</p> <p><i>Specializes in the technology transfer, commercialization of research projects, evaluation, training, custom design and installation of a variety of ART applications to assist people with disabilities to achieve their vocational, educational and independent living goals.</i></p> <p>Kaki Bukit TechPark II, 49 Kaki Bukit View, Singapore 415973 Tel: +6567430262 Fax: +6567430263 Website: http://www.start-centre.com/ Name: Cheong Soon Huat, Business Development Manager Email: cheongsh@start-centre.com</p>	#120
<p>Thailand Association for the Blind</p> <p><i>One of the largest NGOs for the visual handicapped in Thailand.</i></p> <p>85/1-2, Boonyoo, Dindaeng, Samsennai, Phayathai, Bangkok, 10400 Tel: 02246-3835 Fax: 02245-9846 Website: http://www.tabod.net/ Email: info@tab.or.th</p>	#118
<p>Ulrich Alber GmbH</p> <p><i>Specialist for portable, versatile and easy to use mobility aids.</i></p> <p>Vor Demweiben Stein 21, 72461 Albstadt, Germany Tel: 0049.7432.2006-235 Fax: 0049.7432.2006-298 Website: www.ulrich-alber.de/ Name: Marie-Luise Neitz, Export Manager Email: Marie-Luise.Neitz@alber.de</p>	#303 See Advertisement
<p>V.S. Engineering</p> <p><i>Premier manufacturer of rehabilitation and mobility equipment in Thailand.</i></p> <p>7,9 Charunsanitwong Soi 83/1, Charunsanitwong Rd. Bang-Au Bang Plad, Bangkok Thailand, 10700 Tel: +66186979208 Fax: +6628805551 Name: Kanchana Wanichkorn, Asst. to Mangement Director Email: kanchana.wanichkorn@nectec.or.th</p>	#113 & #114

Technical Program Overview

DAY ONE – 13th May 2008 (Tuesday)

Room Time	QP-1	QP-4 (Room A)	QP-5 (Room B)	QP-6 (Room C)	Saithip (Room D)	QP-2 &3	
0800		Registration (QP-3 Foyer)					
0850	Opening Ceremony						
0900	Keynote 1 Prof Arthur Mak						Exhibition
0930	Plenary 1 Mr Monthian Buntan						
1000	Tea Break						
1020	Plenary 2 Prof. Libby Cohen						
1050	Plenary 3 Mr. David Dikter						
1130	Exhibition Resting Area	Quarter Day Workshop QW1 <i>Assistive & Rehabilitative Robotics</i>	Quarter Day Workshop QW2 Navigation Technology for the Blind	Paper Session 1A <i>Biomedical Technology & Study</i>	Paper Session 1B <i>Mobility Aids</i>		
1300	Lunch						
1400	Exhibition Resting Area	Half Day Workshop HW1 <i>Mobility for Elderly Session 1</i>	Half Day Workshop HW2 <i>Accessible Tourism</i>	Paper Session 1C <i>Augmentative & Alternative Communications (AAC)</i>	Student Design Challenge <i>Presentation</i>		
1530	Tea Break						
1600	Exhibition Resting Area	Half Day Workshop HW1 <i>Mobility for Elderly Session 2</i>	Half Day Workshop HW2 <i>Accessible Tourism</i>	Paper Session 1D <i>Emerging Assistive & Rehabilitative Technology</i>	Student Design Challenge <i>Prototype Display</i>		
1730	Adjourn						

DAY TWO – 14th May 2008 (Wednesday)

Room Time	QP-1	QP-4 (Room A)	QP-5 (Room B)	QP-6 (Room C)	Saithip (Room D)	QP-2 & 3	
0800		Registration (QP-3 Foyer)					
0830	Exhibition Resting Area	Paper Session 2A <i>Rehabilitation Study</i>	Paper Session 2B <i>Technology for Visual Impairment</i>	Half Day Workshop HW4 <i>AAC Fundamentals</i>	Full Day Workshop FW1 <i>Daisy Consortium</i>	Exhibition	
1000	Tea Break						
1030	Exhibition Resting Area	Paper Session 2C <i>Rehabilitation Technology</i>	Paper Session 2D <i>Policy & Social Issues</i>	Half Day Workshop HW4 <i>AAC Fundamentals</i>	Full Day Workshop FW1 <i>Daisy Consortium</i>		
1230		Lunch (Parkview Restaurant, Ground Floor)					
1330		Paper Session 2E <i>Computer/Web Accessibility & Special Education</i>	Half Day Workshop HW3 <i>Technology for Person With Disabilities (PWD)</i>	Quarter Day Workshop QW3 <i>Applying Evidence-based Practice to AAC Clinical Assessment Decisions</i>	Full Day Workshop FW1 <i>Daisy Consortium</i>		
1500		Tea Break (Foyer)					
1530		Paper Session 2F <i>Gerontechnology & Intelligent Environment</i>	Half Day Workshop HW3 <i>Technology for Person with Disabilities (PWD)</i>	Quarter Day Workshop QW4 <i>AAC Communication Performance Measurement</i>	Full Day Workshop FW1 <i>Daisy Consortium</i>		
1700							
1710	Guests Be Seated for Keynotes & Gala Dinner						
1800	Keynote 2 Prof Shigeru Yamauchi						
1830	Gala Dinner						
2100		Adjourn					

DAY THREE – 15th May 2008 (Thursday)

Room Time	QP-1	QP-4 (Room A)	QP-5 (Room B)	QP-6 (Room C)	Saithip (Room D)	QP-2 &3
0800		Registration (QP-3 Foyer)				
0830	Exhibition Resting Area	Full Day Workshop FW2 <i>Assistive Technology (AT) Fundamentals</i>	Full Day Workshop FW3 <i>Cochlear Implant (CI) Session 1</i>	Half Day Workshop HW5 <i>Universal Design for Special Education</i>	Half Day Workshop HW6 <i>Seating & Position #1</i>	Exhibition
1000	Tea Break					
1030	Exhibition Resting Area	Full Day Workshop FW2 <i>Assistive Technology (AT) Fundamentals</i>	Full Day Workshop FW3 <i>Cochlear Implant (CI) Session 1</i>	Half Day Workshop HW5 <i>Universal Design for Special Education</i>	Half Day Workshop HW6 <i>Seating & Position #1</i>	
1230	Lunch					
1330	Exhibition Resting Area	Full Day Workshop FW2 <i>Assistive Technology (AT) Fundamentals</i>	Full Day Workshop FW3 <i>Cochlear Implant (CI) Session 2</i>	Half Day Workshop HW7 <i>Information & Communication Technology for Special Education</i>	Half Day Workshop HW8 <i>Seating & Position #2</i>	
1500	Tea Break					
1530		Full Day Workshop FW2 <i>Assistive Technology (AT) Fundamentals</i>	Full Day Workshop FW3 <i>Cochlear Implant (CI) Session 2</i>	Half Day Workshop HW7 <i>Information & Communication Technology for Special Education</i>	Half Day Workshop HW8 <i>Seating & Position #2</i>	Exhibition Closed
1730	Adjourn					

Keynote Speakers



Professor Shigeru Yamauchi

Professor, Department of Health Science and Social Welfare, Faculty of Human Sciences, Waseda University, Japan

Topic: Assistive Products in Japanese Long Term Care Insurance

Abstract

Japanese government launched Long Term Care Insurance in 2000. The premiums are collected from all the persons with 40 years older. The benefits include:

- Home-visit/ Day Services
- Home-visit long term care, home-visit bathing, home-visit rehabilitation, day rehabilitation (day-care), home-visit nursing care, day services
- Leasing of assistive products
- Short-stay service, short-stay care
- In-home medical care management counselling
- Care service with mutual support for the elderly with dementia
- Care service provided in for profit private homes for the elderly, etc.
- Allowance for purchase of assistive products
- Allowance for home renovation (handrails, removal of level differences, etc.)

Details of leasing assistive products will be described together with changes in expenditure, recent system modification and its implication to the assistive product industry.

Biography

Professor Shigeru Yamauchi is currently a professor at the Department of Health Science and Social Welfare, Faculty of Human Sciences in Waseda University. He was educated at the University of Tokyo and has a degree in Engineering Sciences in the field of Inorganic material/Physical properties. He attended Graduate school and graduated in 1972, taking up Industrial Chemistry under the Engineering division. He also received his doctorate degree from the same university under the department of Industrial Chemistry.

He was the research associate at the Faculty of Engineering in the University of Tokyo from 1967 – 1973. He was also a Research Fellow under the Materials Science program at the University of Cincinnati, Ohio, USA from 1967 – 1969. From 1973 – 1975, he became an Assistant Professor at the Faculty of Engineering in the University of Tokyo and in 1975 – 1985, he was promoted to Associate Professor. From 1985 – 1992, he was appointed as the President of the Department of Rehabilitation Engineering, Research Institute, National Rehabilitation Center for Persons with Disability.

He is involved in several academic societies. He was the President (1989 – 1990) of the Japan Association of Chemical Sensors and was appointed as Chairman of the Committee for Rehabilitation Technology in the Japanese Association of Rehabilitation Medicine from 1993 – 1998. He served as President (1999 – 2000) of the

Electromechanical Society of Japan and was the Vice President of the Japanese Society for Wellbeing Science and Assistive Technology from 2003 – 2005. Currently, he is a member of ICTA (International Commission of Technology and Access) of Rehabilitation International.

Professor Shigeru Yamauchi is also the Chairperson of the Advisory Committee for Assistive Products and Housing Modification in Long Term Care Insurance, Ministry of Health, Labor and Welfare and in the Technical Committee on Prosthetic Appliances, Ministry of Health, Labor, and Welfare. From the year 2005 until now, he is the President of the Japanese Society for Wellbeing Science and Assistive Technology. In 2007, he was assigned as the Convener, of ISO/TC 159/SC 4/WG 10, Accessible Design for Consumer Products.



Professor Arthur Mak
Associate Vice President (Academic Development)
Head, Department of Health Technology and Informatics
Director, Research Center for Musculoskeletal Bioengineering
Director, Jockey Club Rehabilitation Engineering Center
Chair Professor of Rehabilitation Engineering
The Hong Kong Polytechnic University

Topic: TeleCare Technology for the Vulnerable at Home and in Community

Abstract

The safety of the vulnerable when they need to stay home by themselves is a big social concern. These vulnerable include the elderly and the disabled. This concern continues to grow as the overall population ages, and as the economic situation requires parents and other adults of the family all out for work and for longer hours. The TeleCare System includes a home-based system which consists of a 24-hour central monitoring system with wireless sensors to non-intrusively monitor indoor activities and identify the abnormal pattern through the lack of activities of the users, and a set of wearable ear-borne and wrist-borne vital sign sensors to continuously monitor real-time heart rate, body temperature, and small body motions around the clock. If any abnormality is detected, the system will automatically activate outgoing links to relevant parties such as physicians, social workers or family members. The TeleCare system also includes a portable device using advanced telecommunication technologies of global positioning, cellular phone and radio-frequency beacon to help accurately and efficiently locate a missing person with dementia in both indoor and outdoor settings. The system would enhance special caring services for the vulnerable, especially those suffering from senile dementia, in the home and community settings.

Biography

Professor Mak obtained his B.Sc. in Engineering Mechanics with highest honor from the University of Illinois at Urbana-Champaign in 1976 and earned his Ph.D. in Biomechanics at Northwestern University in 1980. After spending 3 years of postdoctoral fellowship in Tissues Mechanics under Professor Van Mow at Rensselaer Polytechnic Institute in New York, Professor Mak took up an Assistant Professorship in Bioengineering and Orthopedics Research at the University of Pennsylvania.

Professor Mak joined the Jockey Club Rehabilitation Engineering Center at PolyU in 1988 and was promoted to full professorship in 1995. Professor Mak became Chair Professor of Rehabilitation Engineering in 1997 and in the same year was appointed as the Head of Jockey Club Rehabilitation Engineering Center. Professor Mak is active in local, regional, and international professional bodies related to biomedical and rehabilitation engineering. He chairs the Committee of Vocational Training for People with Disabilities in 1998 – 2007 and served as a member of the Hong Kong SAR Government Rehabilitation Advisory Committee during 2000 – 2004. Professor Mak was the Asia-Pacific Chair of the International Commission for Technology and Accessibility in Rehabilitation International during the period of 1998 – 2004. Professor Mak is the Founding Chairman of the Biomedical Discipline Advisory Panel of the Hong Kong Institution of Engineers, a member of the Asia Pacific Working Group of the International Federation for Medical and Biological Engineering, the Honorary Secretary of the Executive Committee of the World Association for Chinese Biomedical Engineers, and a member of the World Council on Biomechanics.

Professor Mak has held visiting/adjunct faculty positions at Sichuan University and University of Pittsburgh. In 2005, Professor Mak became the Founding Head of the Department of Health Technology and Informatics. The Department is the PolyU home for Biomedical Engineering, Biomedical Sciences, and Biomedical Radiation. Professor Mak is serving in the editorial boards of a number of international journals on biomedical engineering and rehabilitation engineering.

His research interests cover tissue mechanics, biomaterials and tissue engineering, seating biomechanics, peripheral joint biomechanics, prosthetic and orthotic bioengineering. Professor Mak became Associate Vice President (Academic Development) of the University in 2006.

Plenary Speakers



Mr Monthian Buntan
President, Thailand Association of the Blind, Thailand

Topic: Accessibility Through Universal Design and Assistive Technologies: the Matter of “Must” in the Rights-Based Society

Abstract

Convention on the Rights of Persons with Disabilities (CRPD) clearly marks the paradigm shift from disability as pathological limitation of each individual to interaction between individual characteristic and external environment/factors. Among general principles toward ensuring full and effective enjoyment of human rights and fundamental freedoms, “accessibility” is one of the most important requirements which make this first human rights convention of 21st century unique and necessary. Meanwhile, the World summit on Information Society (WSIS) documents also suggest that one way of achieving inclusive information society is by global sharing of knowledge through universal design and assistive technologies. It is within the author’s opinion that accessibility, through universal design and assistive technologies must be indivisible, inseparable part of the inclusive and rights-based society for all, including persons with disabilities.

Biography

Mr. Monthian Buntan was born on May 2, 1965 in Phrae Province, Thailand. He is currently the executive director of Thai Blind People's Foundation and also the president of Thailand Association of the Blind. He took up the Bachelor of Arts in English and Philosophy at Changmai University in Thailand and he graduated with honors in Music from St. Olaf College, Northfield, Minnesota, USA. He has a Masters Degree in Music Theory and Composition from University of Minnesota, USA.

He served as a Committee Member on the Educational Reform for Persons with Disabilities, other Disadvantage groups and gifted children, Ministry of Education from 1999 – 2001. He was also a member of the National Broadcasting Commission Search Committee from 2000 – 2002. In 1999, he founded several organizations in which he is still an active member. The organizations were, Thai National Institute for the Blind where in he is also the Vice Chairperson, Thai Blind People's Foundation in which he is the Secretary, and he is also serving as a coordinator in Thailand National Committee on DAISY Production and Services.

He became a member of the Advisory Committee on Disability to the Prime Minister of Thailand in 2001 until now. He is also currently a member of the Information Technology Committee in the Ministry of Education. In 2002, he became a member of the Executive Committee in the Asia-Pacific Development Center on Disability and in 2003; he became a representative from the Thai government to the UN ad hoc committee for the elaboration of the UN convention on the rights of the persons with disabilities. In 2004, he was elected as the President of the Thailand Association of the Blind.

Mr Monthian Buntan has received several awards throughout the years. He was awarded as the person who contributes to the betterment of life for the blind by the Takeo Iwahashi Award in 2004. He was also awarded with a Plaque of Honor from the Prime Minister of Thailand in 2001 as an Outstanding Individual whose contributions have made significant improvement to the lives of PWDs in Thailand. In 1995, he received the Most Outstanding Person with Disabilities award in Thailand from the Council on Social Welfare. And in 1998, he was awarded the Outstanding Member of the Year from the Alumni Association of Chiangmai School for the Blind.



Professor Libby Cohen

NIE Visiting Scholar

***Professor Emerita* at the University of Southern Maine, United States**

Topic: Advances in Technologies Enable Productive Futures for Persons with Disabilities

Abstract

Imagine a future in which learning is engaging, available, and accessible to nearly all individuals, including individuals with disabilities, throughout the globe. This imagined future is now possible because of a rare convergence of recent discoveries in neuroscience research, new conceptualizations of teaching and learning, and the development of current and emerging technologies. As 21st century citizens, persons with disabilities have available to them a range of technologies that support access and success in schools and communities. Advances in technologies include *flexible technologies*, which can be used across curricula and in multiple teaching and learning contexts; *usable technologies* that are characterized by features that are easy and intuitive to use; and *accessible technologies* that are purposefully designed for a broad diversity of individuals, including those with disabilities. In this plenary session, the convergence will be described and examples will be shared including advances in Thailand, made possible through the leadership of Her Royal Highness Princess Maha Chakri Sirindhorn, and other leaders in Southeast Asian countries.

Biography

Prof. Libby Cohen is a Visiting Professor at the National Institute of Education in Singapore and she is passionate about improving the lives of children, youth, and adults with disabilities. A strong advocate for inclusion of individuals with disabilities in all levels of society, she is especially interested in teaching methodologies, universal design in education, and using technology to facilitate teaching and learning.

Prof. Cohen is the author of numerous articles and books including *Assessment of Children and Youth (3rd ed.)* and *Teaching Students with Learning and Behavior Problems (2nd ed.)*. She has recently co-edited a book for Pearson Asia which focuses on special education in Singapore. The book is entitled "Special Education: Perspectives and Practices." She also has served on the editorial boards of three scholarly journals. She is co-chair of the Scientific Programme for the IASSID Asia Pacific conference which will be held in June, 2009 in Singapore.

Prof. Cohen has led numerous projects in the areas of assistive technology, universal designs and the participation of children and youth with disabilities in science. For several years, she led the State of Maine's (U.S.) initiative that focused on creating and implementing universally designed education. She has been funded in the U.S. by the National Science Foundation, National Aeronautics and Space Administration, Department of Education, Mitsubishi Electric Foundation, and others.

Prof. Cohen is the recipient of University Achievement Awards. She was a holder of the Walter E. Russell Chair in Philosophy and Education was awarded was given the Norwich (Connecticut) Native Daughter Award. She was awarded the title of "*Professor Emerita*" by the University of Southern Maine in the United States.



Mr. David Dikter
Executive Director, Assistive Technology Industry Association, USA

Topic: Bringing Assistive Technology to Developing Markets: Hope and Transformation

Abstract

Over the past several years it has become more apparent to developing economies that both the social and economic needs of people with disabilities needs to be addressed more significantly. Assistive Technology is just one part of this puzzle. Throughout the lifespan of the entire family and community there are significant needs that must be met to enable the use of AT. There needs to be a coordinated set of services and supports in place so that every person with a disability has the opportunity and the perceived potential to develop into an independent contributor in society. One of the strongest developments that enable a person with a disability to become successful is the use of Assistive technologies. These technologies have the power to transform lives and this is the reason there is so much emphasis on AT. Implementing programs and supplying AT to individuals is not as simple as saying we can buy it or supply it. There is a greater infrastructure that must be created to maximize the benefits and change the perception of non-disabled people. This includes training programs for professionals, building awareness among families, consumers and care givers. Working with employers to enhance accessibility at the corporate level to enable future employment. The most important of all is government commitment to fund and support these efforts.

This plenary will focus on some examples of these types of programs and share how this powerful technology can transform lives every day and in turn transform society to be more inclusive.

Biography

Mr David Dikter is the Executive Director of Assistive Technology Industry Association (ATIA).He has been for 15 years following his graduation from Boston's Wheelock College by teaching elementary school students with disabilities in the Boston public school system and even overseas, at the Frankfurt International School in Germany. His passion for technology was touched off in college and came in the form of an Apple 2 computer. From the beginning, he recalls, "*I inherently understood the power of technology as a tool that would enrich my life and the lives of others.*" Both passions have propelled him through two careers.

He left the classroom, but not teaching, when the city of Boston embarked on an ambitious program to place computers in classrooms. He signed on with Boston's Office of Instructional Technology to manage professional development for teachers experiencing the shock of their first-ever encounter with computers.

Desiring a career opportunity in the for-profit world – "*my son had just been born*" – he joined a high tech start-up company as a training manager in the waning days of the dot.com boom, a move, he says, "*that gave me a broader understanding of the business world after all those years in a school system/city government environment.*" The boom quickly went bust, however, opening the way to his present position as head of the nation's premier trade group for AT manufacturers, providers and sellers.

Mr. Dikter now manages the overall mission of ATIA to bring assistive technology to people with disabilities. He is responsible for all aspects of the ATIA annual conference, public awareness, government education and work on national policy issues as it relates to assistive and accessible technologies. Dikter sits on the W3C-Web Accessibility Initiative Steering Council and works with diverse groups to promote AT and the needs of individuals with disabilities.

Workshops

DAY ONE - 13th May 2008 (Tuesday)

QW-1: Rehabilitation & Assistive Robotics Workshop

10:45 – 12:30

Room A (QP-4)

by **Professor Wei Tech Ang**, PhD (Robotics, CMU), Assistant Professor, School of Mechanical & Aerospace Engineering, Nanyang Technological University, Singapore.

by **Professor Etienne Burdet**, PhD (Robotics, ETH-Zurich), Imperial College of Science & Technology, London, UK

This workshop introduces the state of the art robotics research in rehabilitation and assistive applications. The content is designed for robotics technology researchers, healthcare professionals, end users, and anyone interested in the field.

HW-1: Mobility for the Elderly

Session 1: 12:30 – 15:00

Session 2: 15:30 – 17:30

Room A (QP-4)

by **Amy Bjorson**, BS, MPT, ATP, Clinical Education Specialist, Sunrise Medical Australia

Session 1: Unique Clients, Unique Challenges: Successful Equipment Prescription for Your Geriatric Patient

The postural evaluation and body measurements allow the therapist to develop a systematic plan for identifying a client's needs. This workshop will provide immediately applicable concepts for participants involved in the assessment and prescription of seating, positioning and mobility devices. The focus of discussion will be on principles and biomechanics of seating and the assessment process from initial client contact through the final equipment prescription. Included will be analysis of some of the more commonly observed postures and related symptoms in the seated client. Special emphasis will be placed on identifying the symptom and understanding the cause. The process of translating assessment findings into generic product parameters will be reviewed. This course will facilitate critical thinking and assist therapists in confident decision-making, clear documentation and positive objective outcomes.

Session 2: Optimizing Power Wheelchair Function and Performance

Selecting the power wheelchair is just the beginning; the functional needs of each individual user vary greatly. To truly maximize mobility, independence and safety, the power wheelchair electronics must be custom tailored. This instructional course will outline how to select drive controls for involved clients, discuss developing technologies and programming strategies to increase successful outcomes. Integration with auxiliary devices and normal household electronic devices will also be presented. Special emphasis will be placed on maximizing independence for the involved power wheelchair client.

QW-2: Navigation Technology for the Blind

10:45 – 12:30

Room B (QP-5)

by **Mr Cheng Hock Kua**, President, Independent Society of the Blind, Singapore

This is a presentation on the roles of navigation technology for the blinds to gain mobility independence in a wide open world. The workshop will touch on the various options available for blind persons in terms of GPS facilities, how it works (including how it helps the blind persons getting from place to place, or even touring the destination before arriving); and the various types of GPS products available to the blind in this region and other parts of the world.

HW-2: Accessible Tourism

13:30 – 17:30
Room B (QP-5)

Title: **Biwako Millennium Framework (BMF): Tool for Promoting Sustainable Tourism**
by **Ms. Aiko Akiyama**, Social Affair Officer, Population and Social Integration Section,
UNESCAP

Title: **Accessible Tourism as a Means of Economic and Social Development**
by **Disabled Peoples' International Asia-Pacific Region (DPI/AP)**

DAY TWO - 14th May 2008 (Wednesday)

HW-3: Technology for Person With Disabilities (PWD)

13:30 – 17:00
Room B (QP-5)

Panel Discussion – Technology for Persons with Server Disabilities: In the View Point of Consumers.
by **Ms. Suppattraporn Tanatikom & Mr. Terayudth Sukhontavith**

Title: **Barrier Free Network Education: Learning Process towards Wheelchair Repairing**
by **Disabled Peoples' International Asia-Pacific Region (DPI/AP)**

HW-4: AAC Fundamentals

08:30-12:30
Room C (QP6)

by **Mr. Barry Romich**, Engineer by training and a registered Professional Engineer in Ohio. Co-founder, Chairman and CEO of Prentke Romich Company, USA

by **Professor Katya Hill**, Research Associate, University of Pittsburgh School of Health and Rehabilitation Science, USA

Title: **Augmentative & Alternative Communication Fundamentals**

This workshop is designed as a basic overview of information highlighting the best current evidence on the models, principles, and practices applied to making clinical decisions about Augmentative and Alternative Communication (AAC). The workshop will review the goal of AAC, the taxonomy and classification system used to identify and compare AAC strategies and technology including AAC language representation methods, methods of utterance generation, and the human interface. Performance and outcomes evidence will be used to compare the various AAC systems used to build language competence and optimize communication.

QW-3: Applying Evidence-based Practice to AAC Clinical Assessment Decisions

13:30-15:00
Room C (QP-6)

by **Professor Katya Hill**, Research Associate, University of Pittsburgh School of Health and Rehabilitation Science, USA

Title: Applying Evidence-based Practice to AAC Clinical Assessment Decisions

The external, internal and personal evidence will be discussed as applied to the AAC assessment and feature-match process. A model and the components of a comprehensive AAC assessment will be presented. The workshop will focus on participants identifying steps to plan a comprehensive AAC evaluation ensuring consideration for language and communication abilities and needs, the three AAC language representation methods, core and extended vocabulary, and the full range of unaided and aided AAC strategies. The session will include an individual who relies on AAC providing feedback to participants.

QW-4: AAC Communication Performance Measurement

15:30-17:00
Room C (QP-6)

by **Mr. Barry Romich**, Engineer by training and a registered Professional Engineer in Ohio. Co-founder, Chairman and CEO of Prentke Romich Company, USA

Title: AAC Communication Performance Measurement

AAC evidence-based clinical practice requires the measurement of communication performance. Automated tools have been developed to support the collection and analysis of language samples of communication generated using any communication board or speech-output AAC system. This session will begin with a review of the basics of AAC evidence-based practice, including the available tools. Then an individual who uses AAC will interact with the audience, during which time a language sample will be collected. Finally, the language sample will be analyzed and the AAC Performance Report for that individual will be generated and reviewed. Participants will understand the power of this simple foundational practice.

FW-1 : Daisy Consortium

Session 1: 0830 – 1000
Session 2: 1030 – 1230
Session 3: 1330 – 1500
Room D (Saithip)

Title: Accessibility Multimedia Workshop

by **Daisy Consortium**, the worldwide coalition of libraries and institutions serving print disabled persons, developing the open standards, tools, and techniques for the next generation of "digital talking books" (DTB)

Session 1: **What is DAISY? Users and Tools for Reading**

Playback Demonstrations: PC Based, Dedicated Player, Online Service, Telephone Based Services, Mobile Phone Based

Title: Enjoy DAISY!
By **Misako Nomura**

- Session 2:* **DAISY for All Project and the DAISY Consortium
DAISY Consortium and DAISY for All Project**
by **Hiroshi Kawamura**
- DAISY in Thailand**
by **Monthian Buntan**
- DAISY in India**
by **Dipendra Manocha**
- DAISY, a view of the World Blind Union AP**
by **Kua Cheng Hock**
- DAISY and Autism**
by **Representative of the Autism Society of Philippines**
- Session 3:* **National DAISY Development**
by **Dipendra Manocha**
- Cambodia, Kazakhstan, Philippines, Laos and Vietnam**
- Concluding Remarks by Monthian Buntan**

DAY THREE - 15th May 2008 (Thursday)

FW-2: Assistive Technology (AT) Fundamentals

08:30 – 17:00
Room A (QP-4)

by **Professor Katya Hill**, Research Associate, Univ. of Pittsburgh School of Health & Rehabilitation Science, USA

by **Mr. Barry Romich**, Engineer by training and a registered Professional Engineer in Ohio. Co-founder, Chairman and CEO of Prentke Romich Company, USA

This full day workshop is designed as a basic overview of information highlighting the best current evidence on the models, principles and practices applied in making clinical decisions about the major categories of assistive technology. (Note: Augmentative and Alternative Communication (AAC) will be covered on an additional day.) The workshop will focus on the guidelines and steps to build a personal study plan based on individual strengths and weaknesses in specific areas of AT service delivery in order to build clinical competence and evidence-based, client-centred decision-making.

FW-3: Cochlear Implant

Session 1: 08:30 – 12:30
Session 2: 13:30 – 17:00
Room B (QP-5)

Session 1: Pursuing the right technologies and service models for developing countries
Supported by **Cochlear/Initimex**

Welcome Speech by Professor Pairash Thajchayahong
PhD, Senior Advisor - National Science and Technology Development Agency (NSTDA), Thailand and General Chair, *i-CREATE* 2008

Economics Issues and Long Term Costs of Hearing Loss

by **Professor Wong Kein Low**

PhD, MBBS, FRCSGlas, FRCSEdin, FRCSDLO(Eng), FAMS Director, Centre for Hearing and Ear Implants Senior Consultant, Department of Otolaryngology, Singapore General Hospital-Singapore and President of Asia-Pacific Symposium on Cochlear Implant and Related Science 2009

Cochlear Implantation, Thailand's Pioneering Work at Chulalongkorn Hospital

by **Associate Professor Kanate Vaewichit**

MD, Head of Dept. of Otolaryngology, Faculty of Medicine Chulalongkorn University, Thailand

Cost – Utility of Cochlear Implant, a Thailand Perspective

by **Pritaporn Kingkaew**

B. Pharm, Principle Investigator, Cochlear implant project, Health Intervention and Technology Assessment Program Ministry of Public Health, Thailand

Selection Criteria and Outcome at Rajavithi Hospital

by **Dr. Kiertiyos Komin**

MD, Dip. Thailand National Board of Oto–Rhino–Laryngology, Head of the Centre of Excellence in Otolaryngology Rajavithi Hospital, Ministry of Public Health, Thailand

Communication Training for CI Users

by **Dr. Maliwan Tammasaeng**

PhD, Program Director (Master of Education, Special Education) Suan Dusit Rajabhat University, Thailand and Chairperson, Academic committee Foundation for the Deaf under Royal Patronage of Her Majesty the Queen

Roles of Parents in CI Habilitation

by **Dr. Stephanie Lim**

Ed.D, Certified AVT, Senior Auditory-Verbal Therapist, Centre for Hearing and Ear Implants, Singapore General Hospital, Singapore

Remarks on Singapore's experiences in providing CI program

by: **Prof. Wong Kein Low**

PhD, MBBS, FRCSGlas, FRCSEdin, FRCSDLO(Eng), FAMS Director, Centre for Hearing and Ear Implants Senior Consultant, Department of Otolaryngology, Singapore General Hospital-Singapore and President of Asia-Pacific Symposium on Cochlear Implant and Related Science 2009

Session 2: Further Insights into Cochlear Implant Technology and its Usage

Supported by DMED Hearing

Welcome Speech by Dr. Pasin Israsena

NECTEC-Thailand

Cochlear Implant Technology, Present and Future

by **Chanida Kanchanalarp MD**

FRCOT, FICS, Department of Otolaryngology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Thailand

Research Methodologies for Cochlear Implant and Other Neural Prosthesis Devices

by **Prof June Kim Sung**

PhD, Professor of School of Electrical Engineering and Computer Science
Director of Nano Bioelectronics and Systems Research Center
Seoul National University, Korea

Medical Considerations Before and After Implantation

by **Chanida Kanchanalarp MD**

FRCOT, FICS, Department of Otolaryngology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Thailand

Recommended Rehabilitation Process for CI Recipients

by **Associate Professor Krisna Lertsukprasert MA**

Department of Otolaryngology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Thailand

Panel Discussion: Working Towards Appropriate CI Programs for Developing Countries.

by **Doctors, Teachers, Service Providers, Users and Parents**

All of whom have critical roles for a successful implantation program

Cochlear implant is the latest technology that has enabled people who are profoundly deaf to hear again or for the first time. The relatively high costs involved in providing and maintaining the implantation, however, has been one of the major obstacles that limit access to the technology. Increasingly, this has become a concern especially in the developing countries. As part of the convention, the workshop aims to provide an open stage for interested parties to share information and discuss the visions for best practices in CI usage in developing countries. The topics include hearing loss and cochlear implant technology, selection criteria, access and servicing, and facilitation processes. The workshop programs include presentations and panel discussions by invited experts in cochlear implant.

HW-5: Universal Design for Special Education

08:30 – 12:30

Room C (QP-6)

by **Professor Libby Cohen**, NIE Visiting Scholar, "Professor Emerita" at the University of Southern Maine, United States

by **Dr. Loraine Spenciner**, Professor, University of Maine at Farmington, USA

by **Dr. Meng Ee Wong**, Assistant Professor, National Institute of Education

by **Mr. Mazlan Hasan**, Senior Instructional Designer, National Institute of Education

by **Dr Marissa Wettasinghe**, Assistant Professor, National Institute of Education

Imagine the Possible: Universal Design of Teaching & Learning

Universal design in education makes processes and content accessible for all learners, including those who have diverse cultural and linguistic heritages and individuals who have disabilities. This session will explore the use of technology as it supports increased access to and engagement in teaching and learning for individuals with disabilities. Examples will be shared on how current and emerging technologies can transform the teaching and learning of all individuals.

HW-7: Information & Communication Technology for Special Education

13:30 – 17:00

Room C (QP-6)

by **Mr. Mazlan Hasan**, Senior Instructional Designer, National Institute of Education

by **Dr Marissa Wettasinghe**, Assistant Professor, National Institute of Education

Infusing IT into Your Classroom for Enhanced & Engaged Teaching

Information Technology has been used to a great extent in main stream schools but how far has it reached into the special education classroom. This workshop hopes to introduce you to some free software which educators can use to create online learning resources. The presenters will also discuss teaching strategies & methodologies which can be used when incorporating IT into teaching and learning.

HW-6: Seating & Position #1

08:30 – 12:30

Room D (Saithip)

by **Penny Knudson**, Occupational Therapist, Business Unit Manager, Otto Bock, Australia

Title: **Seating Assessment – Function, Posture & Mobility**

This workshop will provide a framework for a thorough seating assessment, considering posture, function and mobility, and an understanding of the postural, functional, biomechanical and medical issues to be aware of during a seating assessment. Case studies will be used to assist the participants to apply the information to real life examples. Opportunities will also be given for practicing a postural assessment on other workshop participants.

HW-8: Seating & Position #2

13:30 – 17:00

Room D (Saithip)

by **Penny Knudson**, Occupational Therapist, Business Unit Manager, Otto Bock, Australia

Title: **Not Just Seating – 24 hour Positioning for Children**

To maximize the success of postural interventions with children with disabilities, consideration should be given to their posture in a range of equipment. 24 hour positioning involves assessing and providing postural options for seating, standing, sleeping and alternative positioning.

Student Design Challenge

Introduction

A new challenge event known as the Student Design Challenge introduced at *i-CREATE* 2008 with the inaugural challenge theme – "*Human Machine Interface*".

Student teams from different varsities around the world will pit their design and engineering skills against one another. The challenge will provide an opportunity for them to showcase their talent in front of an international panel of Rehabilitative and Assistive Technology experts and at the same time providing a platform to reach out to future designers in the field.

The Student Design Challenge will also provide *i-CREATE* attendees with refreshing perspectives on how design teams from different disciplines and different parts of the world approach a common design problem.

With the theme in mind, the Students are to design and develop a device or prototype that is related to Assistive Technology. The teams must clearly illustrate their design decisions and demonstrate the human-centered design processes that have been followed.

The teams will present their design concept using PowerPoint slides, poster and a working prototype. They will be assessed on the exposition of methodology, the originality of design, and ability to communicate the proposed solution to the reviewers and the judges. There will be fantastic cash prizes to be won.

Presentation

All teams are required to do a presentation covering the key ideas of the project. The presentations are scheduled at 14:00, 13 May 2008, in the Saithip Room (Room D) Level 3. Each presentation is 5 min.

Poster & Prototype Display

All teams are required to display their posters at the Queen's Park 2 & 3 Foyer, from 13 May 2008, 8:00 to 15 May 2008, 15:30. Prototype display will be at the following time:

- (i) 13 May 2008, 13:15 – 13:45 (Open to Delegates and Public)
- (ii) 13 May 2008, 16:00 – 17:30 (Judges only)
- (iii) 14 May 2008, 12:45 – 13:15 (Open to Delegates and Public)
- (iv) 14 May 2008, 17:00 – 18:00 (Guest of Honor and VIPs only)

At least one team members must be present with their posters and prototypes during the above sessions.

Judging and Awards

A panel of 4 international judges of different professional backgrounds will be invited to judge on the projects. All judges' score will carry equal weights. Decision of winners need not be unanimous. The panel of judges will judge the project entries during the presentation session, followed by a tour to visit and try on the prototypes. The judges will award the top three teams:

Champion – US\$500 and Certificates for all team members
Runner-up – US\$300 and Certificates for all team members
2nd Runner-up – US\$100 and Certificates for all team members

Peers' Choice Award

This award is decided by the SDC participants and is independent of the judges' decision. Each team is allowed to cast ONE vote on the most deserving student design challenge entry. They cannot vote for themselves. The votes

have to be cast at the end of the presentation session. The winner of the Peers' Choice Award can also be a winner of the top three prizes.

Gala Dinner

The top three teams and the Peers' Choice Award winners will be invited to the Gala Dinner. The invitation will be made by the organizer at 14 May 2008, 15:30. The results will be announced at the Gala Dinner.

Student Design Challenge Entries

SDC-1

3rd Eye Cup

Min Juan Zhu, Jing Jing Toh

ITE College Central (Tampines Campus), Singapore

SDC-2

AutoPill

Nurhidaya bte Amin, Tai Cheng Tang

ITE College East (Simei), Singapore

SDC-3

Bioengineering Tool for Formulation and Delivery of Lipid-Based Drugs in Rehabilitation

Youqing Xu, Shanthini Rajendian, Nur Naadhirah Rashid Ridza, Yikai Wang, Ravichandran Subbaraman

Temasek Polytechnic, Singapore

SDC-4

Budd-Way

Tanet Aroonthawornwong, Kornkanok Techaratanayuenyong, Mongkolpornudom, Kittisak Chaturatippradap

King Mongkut's Institute of Technology Ladkrabang, Thailand

SDC-5

Computer notebook for the visually impaired

Thanathip Limna, Suppachai Madue, Vorapol Thinnagonsutibut, Witchuda Kiatjaroensak

Prince of Songkla University, Thailand

SDC-6

e-touch

Chien-Lin Wang, Jun-Tang Yang, Yueh-Yu Hung, Zheng-Zung Liou, Tsai-han Chiou

Chung Shan Medical University, Taiwan

SDC-7

Fun-xercise

Ce Yu Poo, Gim Chew Philip Teo

ITE College West (Dover Campus), Singapore

SDC-8

Home Monitoring System

Wai Sheng How, Muhammad Imaduddin Bin Mustafa

Singapore Polytechnic, Singapore

SDC-9

Hybrid Continuous Passive Motion Machine

Jirayu Janchot, Rachapong Apisitsareekul

King Mongkut's Institute of Technology Ladkabang, Thailand

SDC-10

Local Positioning System for Human Tracking

Nakarin Paluecha

King Mongkut's University of Technology Thonburi, Thailand

SDC-11

MagCulator

Abdul Rahim B Muhammad Farid, Bowen Jonathan Lim

ITE College East (Simei), Singapore

SDC-12

Manual Standing Wheelchair

Niran Maipothi, Anusit Srijanya, Konnarong Srimee

Thammasat University, Thailand

SDC-13

Padlock Key Alert

Muhammad Hanafee Bin Jamin, Muhammad Saiful Bin Aziz

ITE College West (Dover Campus), Singapore

SDC-14

Parkinson's Patient Mobility Aids

Khian Huat Peh, Yin Pin Edmund Yeo, Fatimah Siti

Ngee Ann Polytechnic, Singapore

SDC-15

Secure Spoon

Kun Ming Yeow, Weixiang Ben Chen

ITE College Central (Tampines Campus), Singapore

SDC-16

Sensory Re-education device for Stroke Patient

Mei Ling Lau, Mei Po Ho

Hong Kong Polytechnic University, Hong Kong

SDC-17

UbiCare

Orachorn Sukseen, Veerapong Bantip, Tanapong Piansompon

Thammasat University, Thailand

SDC-18

Voice Command System for In-house Electronic Devices

Wanich Poommarin, Suppachai chaleansuk

King Mongkut's University of Technology Thonburi, Thailand

Paper Presentations

DAY ONE - 13th May 2008 (Tuesday)

1A – Biomedical Technology & Study

10:45 – 12:30

Room C (QP-6)

<p>10:45- 11:00</p>	<p>Variation of Stretch Reflex Threshold During Pendulum Test Chul-Seung Kim, Gwan-Moon Eom * <i>Konkuk university, Korea</i> * <i>Biomedical Engineering, Konkuk University, Korea</i></p> <p>The purpose of this study is to investigate the variation of stretch reflex threshold during pendulum movement in stroke patients, and to find the difference of variation corresponding to the severity of spasticity. We examined the angle and velocity thresholds of stretch reflex by using the pendulum test. We calculated trends in the onset times and time course of dynamic thresholds of angle and velocity within each individual using a linear regression. To investigate the relationship between the angle and velocity threshold, the correlation was calculated using linear regression. The angle threshold had increasing trend and the velocity threshold had decreasing trend in all subject. High level spastic patients might be weakened the stretch reflex adaptation function and the angle threshold increased slower than low level spastic patients. The dynamic angle and velocity thresholds had significant correlation, and the static stretch reflex threshold was significantly different between groups with different level of spasticity.</p>
<p>11:00- 11:15</p>	<p>The Influence of Sensory Disturbance on Postural Control During Spin Turn 180° Chih-Feng Lin, Kok-Soon Soon *, Ming-Yih Lee ** <i>School of Physical Therapy, Chung Shan Medical University, Taiwan, R.O.C.</i> * <i>Graduate Institute of Mechanical Engineering, Chang Gung University, Taiwan, R.O.C.</i> ** <i>Graduate Institute of Medical Mechatronics Engineering, Chang Gung University, Taiwan, R.O.C.</i></p> <p>We studied the visual contribution to postural steadiness by recording the postural sway during turning with eyes open or eyes closed. The center of mass (COM) trajectory was recorded in 10 subjects mean aged 22.1 years (SD ± 2 years) turning on a flat surface or foam surface. The three postural dependent variables calculated were sway velocity and variability of COM displacements in the medial-lateral (M-L) and anterior-posterior (A-P) directions. Due to the increase of the variability of sway velocity, M-L and A-P directions with their own mean values, repeated measures ANOVA was applied to the data to investigate the presence differences. Significantly more variability was observed in sway direction than the visual for M-L body sway COM variability. Additionally, the sway direction revealed significantly greater M-L body sway COM variability than the eyes condition. No differences were observed between the sway velocities for any dependent variable. Therefore, the greatest COM variability was observed in the M-L body sway direction either spin turn on flat surface or foam surface. Further, an interesting relationship between the measures of COM variability and body sway velocity was described.</p>
<p>11:15- 11:30</p>	<p>A Comparative Study to Localize the EEG Activity in the Brain Khemakhem Rafik, Zouch Wassim, Ben Hamida Ahmed, Ahmed-Taleb Abdelmalik* <i>Unité de Recherche en Traitement de l'Information et en Electronique Médicale 'TIEM' ENIS, Université de Sfax, Tunisie, Tunisia</i> * <i>Laboratoire LAMIH Université de Valenciennes et du Hainaut Cambrésis LAMIH, France</i></p>

	<p>Scalp electric potential is due to the primary current density distribution that arises from neuronal post-synaptic processes. Estimation of the cartography of the electric potential in the scalp surface requires a solution to the EEG inverse problem, but, there is no unique solution to this problem. In this paper we present Weighted Minimum Norm "WMN", the Low Resolution brain Electromagnetic TomogrAphy "LORETA" and the WMN-LORETA methods. The purpose of this paper is to present the technical details of these methods, and give some comparison between them. The results demonstrate that using each method, we obtain different results given the reconstruction in 3D of the cerebral activity in the brain from where we evaluate the efficiency of the WMN-LORETA method compared to the good results given LORETA method.</p>
<p>11:30-11:45 1A-4</p>	<p>Nerve Cuff Electrode for Thoracoscopic Implantation Z. Lertmanorat, P.Pongpanitanont, S.Wattananit, S. Rhaipu <i>Mahidol University, Thailand</i></p> <p>Diaphragm pacing has been used for the last three decade to restore respiratory for patients with ventilator dependent such as tetraplegia, hypoventilation syndrome. Several stimulating sites have been proposed including intramuscular or epimysial electrodes placed on the diaphragm, nerve cuff electrode placed on the phrenic nerve at either the cervical or thoracic areas. The thoracic approach can fully activate the diaphragm; however, the electrode implantation requires an invasive thoracotomy.</p> <p>This study presents a nerve cuff electrode suitable for thoracoscopic implantation. The electrode can be held opened by a grasper device. Once the nerve is placed inside the opened electrode and the grasper is detached, the electrode can hold itself onto the nerve and does not require any other lock mechanism. The electrode was implanted successfully on phrenic nerve in two acute canine studies. Chronic animal experiments are underway to validate the safety of this electrode.</p>
<p>11:45-12:00 1A-5</p>	<p>Modelling and Control of Intravenous Drug Delivery System Aided by Optical Bubble Detection Tools Subbaraman Ravichandran, Rajendian Shanthini, Rashid Ridza Nur Naadhirah, Yikai Wang, Jayakumar Deviga <i>Temasek Polytechnic, Singapore</i></p> <p>Modelling techniques for optimizing bubble detection tools in the Infrared band used in conjunction with a drug transport mechanism for the transport of intravenous fluids used in clinical practice have been evaluated qualitatively using simulation techniques. This clearly explains the merits and demerits of the system in real time conditions.</p>
<p>12:00-12:15 1A-6</p>	<p>Finite Element Simulation of the Spine with Haptic Interface Gibson Ian, Zhan Gao <i>National University of Singapore, Singapore</i></p> <p>This study describes construction of a finite element model of the human spine that may be used to assist investigation of clinical problems by predicting its biomechanical behaviour. We describe a combination of online real-time FE simulation supported by an offline non-linear FEA solver. Haptic feedback is provided in the real-time simulation to enhance the human-computer interaction within the system. Approximate results of spinal deformation can be obtained from the haptic online FE simulator. The offline FEA solver provides more detailed deformation and strain/stress information using the primary simulation results from the online simulator.</p>

<p>12:15-12:30</p> <p>1A-7</p>	<p>Implementation of Swallowing-Assisted Algorithms for Dysphagic Patients using a Digital Signal Processor</p> <p>Pornchai Phukpattaranont, Sawit Tanthanuch, Kanadit Chetpatananondh, Surapon Tienmontri, Booncharoen Wongkittisuksa <i>Prince of Songkla University, Thailand</i></p> <p>This article presents an application of a digital signal processor for reducing a power line noise and detecting a swallow signal in surface electromyography (SEMG) from a dysphagic patient, a person who has difficulty in swallowing. The sampling rate at 1000 sample/s was used in SEMG data acquisition. Each sample was collected with 16-bit resolution. We use an adaptive linear neural network (ADALINE) filter and least mean square (LMS) algorithms to reduce power line noise. Parameters used for testing performance of the ADALINE adaptive filter are as follows: number of tapped delay line = 10, delay = 10 and learning rate = 0.0156. Results from the real-time implementation on TMS320VC5509A demonstrate that the system can successfully eliminate both 50-Hz power line noise and its odd harmonic components. In addition, the swallowing detection system based on the digital signal processor functions correctly. In other words, the trigger signal is appropriately generated for 1 second when the beginning point of swallowing signal is detected. When total number of swallows was 40, the system was able to detect 37 times of swallows correctly.</p>
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1B – Mobility Aids

10:45 – 12:30

Room D (Saithip)

<p>10:45-11:00</p> <p>1B-1</p>	<p>Data Requirements and a Spatial Database for Personalized Wheelchair Navigation</p> <p>Kasemsuppakorn Piyawan, Karimi Hassan <i>University of Pittsburgh, USA</i></p> <p>A spatial database is an essential part of a navigation system since it provides the necessary resources to perform navigation and routing functions, among others. While generally wheelchair navigation and car navigation overlap from the functional standpoint, databases for car navigation are not suitable for wheelchair navigation. One major difference between databases for car navigation and wheelchair navigation is that operations in car navigation are centered around road networks along with road segment attributes, whereas operations in wheelchair navigation are primarily centered around sidewalk networks along with unique parameters related to accessibility information about the surrounding environment. In this paper, we discuss the data (spatial and non-spatial) requirements and a database for wheelchair navigation. We also report our experience in constructing a spatial database of the University of Pittsburgh campus area for wheelchair navigation.</p>
<p>11:00-11:15</p> <p>1B-2</p>	<p>Seat Interface Pressure Characteristics of Plegia</p> <p>Junghwa Hong, Gwang-Moon Eom *, Byung Kyu Park <i>Korea University, Republic of Korea</i> * <i>Konkuk University, Korea</i></p> <p>This study investigated characteristics of interface pressure distribution of right and left hemiplegia (rt_hemi and lt_hemi), paraplegia (para), quadriplegia (quadric), and normal subjects (normal) during wheelchair seating. A total of 73 subjects were participated in this study. Maximum interface pressure, mean interface pressure, and interface pressure gradient in the right and left sides of buttocks were measured for 30 minutes while minimizing possible movements of participants and using a same manual type wheelchair with a fabric seat. The ANOVA was performed using the data measured at the end of the test. There were substantial differences in the mean interface pressure on the buttocks between rt_hemi and lt_hemi. The maximum interface pressure on the buttocks was significantly high in hemi, para and quadric compared to normal. A statistically significant difference in the maximum interface pressure</p>

	<p>gradient on the buttocks as found between paralytic patients and normal people. Based on these results, a new approach for developing seat cushion orthosis to prevent decubitus ulcer is required for even distribution of interface pressure considering individual paralytic characteristics. In addition, the maximum interface pressure and gradient on the buttocks could be used as a useful clinical-biomechanical guideline in developing a seat cushion orthosis for preventing decubitus ulcer of paralytic patients.</p>
<p>11:15-11:30 1B-3</p>	<p>Determination of the Vertical Centre of Mass of a Wheelchair and Occupant Bill Contoyannis, Jenna Davis, Fiona Swan, Megumo Ito <i>Monash University, Australia</i></p> <p>The position of the vertical centre of mass of a wheelchair and occupant is important in relation to the stability and comfort of the wheelchair. This project aimed at improving the accuracy, safety and user-friendliness of the pendulum method of location the vertical centre of mass of a wheelchair and occupant. A rig was built to act as a simple pendulum and swing the wheelchair and occupant on a platform from angle less than 15°. The platform was also used to estimate the horizontal centre of mass. The rig was verified by testing the method on a steel cylinder with a known centre of mass. Using a motion timer, the time for one oscillation was recorded ten times for each test. The wheelchair and occupant were tested alone and with different front and back loads to observe the change in the position of the centre of gravity due to loading. The time recordings were very consistent and the result for the cylinder had an error of 1cm which could be minimised by using a timer correct to three decimal places rather than two. The platform and rig were improved by the additions of "legs" and adjustable stoppers. The results for the vertical centre of mass of the wheelchair and occupant showed that loading has a significant impact on the position of the centre of mass. Further improvements were suggested to ensure that the method is suitable for a clinical environment and testing of the method with a wheelchair dependent subject is needed to confirm that this is an agreeable method of location the vertical centre of mass.</p>
<p>11:30-11:45 1B-4</p>	<p>A Novel Rugged All-terrain Wheelchair: Opening the Door to Outdoor Recreation and Off-road Travel for People with Mobility Impairments Jesse Owens <i>University of Alaska Anchorage, WWAMI Biomedical Program, USA</i></p> <p>When a person acquires severe mobility impairment, especially an injury leading to the use of a wheelchair, natural settings become very difficult to access. Many studies find that outdoor recreation for people with disabilities is an exceptionally positive step in rehabilitation; it improves self image, increases fitness, reduces obesity, and produces a more favorable impression of the disabled person by the able-bodied population (1, 3, 4, 6, and 10). Since conventional wheelchairs are of little use on rugged terrain, I developed the Kilikart* to enhance access to natural settings. The Kilikart is stable, durable, and permits able-bodied assistants to help power and stabilize the disabled rider. The device has been thoroughly tested and permits important new options for outdoor recreation and transport.</p>
<p>11:45-12:00 1B-5</p>	<p>He Stand-N-Go*: A Low-cost, Hand-Powered Mobile Standing Frame for Paraplegics Jesse Owens <i>University of Alaska Anchorage, WWAMI Biomedical Program, USA</i></p> <p>Despite important advances in workplace accommodations for wheelchair users in wealthy countries, most work environments around the world are still not suitable for wheelchair users. This is a serious problem especially in developing countries. Unfortunately, the inability to stand and move about precludes many disabled people from employment. To help solve this problem, the Stand-N-Go was developed for paraplegics who wish to move about, work or play, all while standing. The device has lower body support but operates and manoeuvres like a wheelchair. It adjusts to custom-fit users in order to prevent pressure points on bony prominences. The Stand-N-Go presents an important opportunity for wheelchair users to function in previously inaccessible environments. In some cases this device can make the home or workplace usable for a paraplegic without the need for expensive structural modifications. In</p>

	<p>addition, significant medical benefits result from standing upright in a weight bearing position. In spite of its sophistication, the Stand-N-Go could be manufactured at low cost in developing countries for domestic use and perhaps export.</p>
<p>12:15-12:30 1B-6</p>	<p>Hybrid P300 and Mu-Beta Brain Computer Interface to Operate a Brain Controlled Wheelchair Brice Rebsamen, Etienne Burdet *, Qiang Zeng, Haihong Zhang **, Marcelo Ang <i>National University of Singapore, Singapore</i> * <i>Imperial College London, United Kingdom</i> ** <i>Institute for Infocomm Research, Singapore</i></p> <p>This paper describes a control strategy to drive a wheelchair in a building environment by thought. The user selects the destination in a list of predefined locations of interest using a slow but safe P300 EEG interface. The robotic wheelchair navigates autonomously toward destination following virtual guiding paths. Along the way the user has the possibility to stop the movement using a fast mu-beta-rhythm BCI. Experiments demonstrate how healthy subjects can navigate safely in a home-like environment using this novel hybrid BCI.</p>

1C – Augmentative & Alternative Communications (AAC)

13:30 – 15:00

Room C (QP-6)

<p>13:30-13:45 1C-1</p>	<p>Asian Work Choices: How AAC Can Liberate the User Nigel Duckett <i>Liberator Pty Ltd, Australia</i></p> <p>Each culture and nation has its own tradition concerning work and employment. There are varying attitudes towards what is considered real work, namely an activity that contributes to societal improvement. There is an immediate need to explore different cultural definitions of employment and how these might relate to a concept of individual independence. For users of AAC, greater competence leads to a better chance of involvement and inclusion in society. A natural consequence is a desire to contribute and be rewarded. Without a voice, work choices become extremely limited. By contrasting the American and European experiences with the expectations of people with speech impairments living in Asia, insight can be gained into the true value of AAC implementation.</p>
<p>13:45-14:00 1C-2</p>	<p>A New Assistive Communication System for the Serious Disabled Shih-Chung Chen, Ching-Yi Chien, Wei-Min Chang, Shu-Wen Lin * <i>Southern Taiwan University, Taiwan</i> * <i>National University of Tainan, Taiwan</i></p> <p>In this research, we realized an assistive system based on lips images recognition [1][2][3] for the communication of the disabled. This system is composed of the software system mainly and the auxiliary hardware system. In the software system, we developed a recognition algorithm for the open/close status of lips images, including the face detection, the face tracking, the lips pattern recognition, the lips locations and extraction, the lips images processing, etc., and developed a fuzzy algorithm to recognize long tone/silence or short tone/silence of Morse codes [4]. After the fuzzy recognition, the open/close statuses of lips images can be transferred to Morse codes to input the letters, achieving the functions of word processing. Regarding the hardware of the lips-control assistive communication system, we have primarily realized the remote control system for electrical home appliances. Once the system obtains information of open/close statuses of lips images after recognition, the original parallel port interface of general computer and RF module can be used to carry out further remote control functions of home appliances. In conclusion, we have completed an assistive communication system for the disabled without wearing any appurtenance. After finishing some word</p>

	<p>processing tests and home appliance control tests for the whole system, we believe that the new augmentative assistive communication system will be more helpful for the serious disabled especially with vertebra damaged. We hope our study can improve the communication abilities of the disabled and make some contributions to society.</p>
<p>14:00-14:15 1C-3</p>	<p>Sound Commanded OpenOffice Writer Thiengkunagrit Wasin <i>Prince of Songkhla University, Thailand</i></p> <p>Motivated from Microsoft Word which allows users to use their voice as shortcut to operate functions; this project has been developed based on open source. OpenOffice Writer [3] was chosen as open source word processor program because of the capability to integrate new feature into main program easily via plug-in. And Sphinx4 [2] project was selected as application programming interface (API) for capturing and processing sound. By combining OpenOffice Writer and Sphinx4, the open source word processor program which allow user to use their sound as shortcut to bring inaccessible functions closer to users was created.</p>
<p>14:15-14:30 1C-4</p>	<p>Development of Thai Word Recognition System for Esophageal Speaker Using Model Adaptation based on HMM Sabayjai Piyada, Boonpramuk Panuthat, Polwisate Wutthichai, Kayasith Prakasit* <i>Control System & Instrumentation Eng, King Mongkut's Univ. of Technology, Thonburi, Thailand</i> <i>* National Electronics and Computer Technology Center, Thailand</i></p> <p>The paper represents a method to develop an automatic speech recognition system for Thai oesophageal speaker. Using model adaptation approach, a speech recognition built by normal speech corpus is modified by oesophageal speech model based on Hidden Markov Models (HMMs). The aim of the paper is to improve the recognition rate of oesophageal speech using two different approach; model adaptation technique and three cepstral normalization technique. The experimental results show that the model adaptation technique can significantly improve the recognition rate of oesophageal speech from 12.6% up to 78.1%. Moreover, the recognition rate is raised up to 93.0% when a cepstral normalization technique (CMMN) is combined to the model adaptation.</p>
<p>14:30-14:45 1C-5</p>	<p>Improvement of Esophageal Speech by Adaptive Line Enhancement with Bias Tuangpermsub Nuntaporn, Boonpranuk Panuthat, Polwisate Wutthichai, Kayasith Prakasit* <i>Control System & Instrumentation Eng, King Mongkut's University of Technology Thonburi, Thailand</i> <i>* National Electronics and Comouter Technology Center, Thailand</i></p> <p>The main objective of this research is to develop a portable speech enhancement device that would sequentially estimate clean speech and re-synthesis a more intelligible speech output for oesophageal speaker. To resolve a real time processing problem, we propose a noise reducing algorithm called Adaptive Line Enhancement (ALE) with bias model. The method simultaneously reduces noises both from environment (or external noises) and from his/her voice (or internal noises) such as breathing noise, oesophageal utterance noise. Incorporating a weighting coefficient bias into a conventional ALE filter, the filter has been proved empirically to perform better than the conventional one. In addition, the method can be applied without neither a laborious pre-training process nor a priori time consuming noise-power estimation.</p>

1D – Emerging Assistive & Rehabilitative Technology

15:30 – 17:15

Room C (QP-6)

15:30-15:45	Future Directions in Hearing Aid Testing and Evaluation Pasin Israsena, Sumate Lertamonsin <i>NECTEC, Thailand</i>
1D-1	<p>This paper reviews present industrial-standard practice in hearing aid electroacoustic measurements, especially for quality assurance purposes, and discusses the future directions in advanced hearing aid measurements. Modern hearing aids possess non-linear digital signal processing (DSP) functions such as noise reduction or acoustic feedback cancellation, for which the present standard developed for the earlier analog-based generation may not be entirely appropriated. It is envisaged that the updated procedure could include features such as qualitative measurements on directionality, SNR and noise suppression.</p>
15:45-16:00	Design of Inductive Sensors for Tongue Control System for Computers and Assistive Devices Eugen Romulus Lontis, Lotte N. S. Andreasen Struijk <i>Aalborg University, Denmark</i>
1D-2	<p>Design of air-core inductive sensors in printed circuit board technology is presented. Comparative analysis with existing hand made inductive sensors is performed with respect to inductance, resistance, and sensitivity to activation when a soft ferromagnetic material is placed in the center of the sensor. Optimization is performed in a finite element model. This technology allows flexibility in design, automation of production and ease of possible integration with supplying electronics. The basic switch function of the inductive sensor can be extended to two-dimensional movement detection for pointing devices.</p>
16:00-16:15	Using Intentional Muscle Contractions as Input Signals for Various Hands-free Control Applications Torsten Felzer, Rainer Nordmann <i>Darmstadt University of Technology, Germany</i>
1D-3	<p>This paper deals with an alternative input method based on tiny muscle contractions for the use with a variety of target applications. The previously introduced Hands-free Mouse Control System (HaMCoS) is one example of a tool resulting from this input strategy. The system allows its user to completely operate a Windows(R) PC without the need to use the hands. Therefore, it can be very helpful for a person with a severe physical disability who is able to wilfully contract one single muscle (since that is all it takes). The same idea has been applied to a control system for an electrically powered wheelchair. Both systems focus on a similar target population. The paper briefly describes how the muscle-based input signals are detected and how they are processed in the two control applications. As a third application, an environment control system - again primarily targeting people with special needs - is finally proposed. The graphical user interface (GUI) and the basic structure of the proposed tool are presented in thorough detail. Possible implications considering this input method for non-disabled users are also addressed.</p>
16:15-16:30	EEG (Mind controlled) System with Four Trigger States in a Multi-level Haptic Devices for Disabled Persons William Kangdra, John Heng, Subhasis Banerji <i>Nanyang Technological University, Singapore</i>
1D-4	<p>This paper describes the work that has been carried out so far to establish viable, practical, low</p>

	<p>equipment and low computation cost system of a wider Electroencephalogram-Surface Electromyograms (EEG-SEMG) based control system for disabled users. The system consists of the user required to perform mental tasks for our system to achieve 4 states of switching which is picked up through the EEG sensors. The system will then use this as a trigger in order to help the disabled user operate everyday equipment (e.g. electrical appliances, operate wheel chair, or personal computer). The system is designed to be compact and low cost as it is intended that the system can be worn on the patient or carried around in the wheelchair. The setup of the equipment, the process of the experiments, the types of mental tasks that the user will be required to perform, signal processing and corresponding trigger output commands that are generated will be described.</p>
<p>16:30-16:45 1D-5</p>	<p>New Directions in the Creation of UE Rehabilitation Robotic Devices for Stroke Patients William Kangdra, John Heng, Subhasis Banerji <i>Nanyang Technological University, Singapore</i></p> <p>On reviewing products and literature in recent UE rehabilitation engineering research, one finds significant differences in the directions that rehabilitation engineering is adopting and that which clinical practice is advocating. Combining a study of current practices in robotic device development for the hand(9-19), clinical practice for stroke(1, 8), biological mechanisms and natural movement(32,33), an attempt has been made to re-align the thinking on UE Orthosis development. In this paper we propose new directions which have been adopted by us to bridge this gap, with respect to UE Orthosis. Preliminary study with some of these often neglected design considerations are then presented as a low cost, versatile, and simple option that may help to keep the patient motivated to continue UE therapy. Three new directions discussed in this paper are: 1. Making robotic therapy more "collaborative" by encouraging more HMHI (Human Machine Human Interaction) rather than just HMI (Human Machine Interface). 2. Using other biological positions during UE motor re-learning rather than only sitting. 3. Giving patients a menu of triggers to choose from and adapt, rather than single or fixed triggers. Results of preliminary experiments have been enumerated.</p>
<p>16:45-17:00 1D-6</p>	<p>Applied ECG Biometric Technology for Personalization on Disability Population Tsu-Wang Shen <i>Tzu Chi University, Taiwan</i></p> <p>There are many u-health applications and smart home technologies for a secure, easily applied, low-cost method to identify individuals for security and medical reasons. However, some biometric systems may not applicable on disability population when people lost their hands, eyes, and voice. Personalization is also an essential issue for u-health application as well because it can adapt users' behaviors, profiles, and certain patterns. The benefits of a personalized embedded system not only potentially reduce complexities on medical devices, but also adapt end-user conventionality daily. Once u-health devices are applied on multiple users or people with disability, an automatic personalization system becomes more essential. The electrocardiogram (ECG) is not only a very useful diagnostic tool for clinical purposes, but also as a new biometric tool for human identification. Best of all, it can be applied on disability population. The ECG biometrics can easily be combined with other biometrics to provide an extra liveness test with little additional cost. A total of 168 normal, healthy individuals were investigated for identification as a predetermined group. Fifty persons were randomly selected from this ECG biometric database as the development dataset. Then, the identification algorithm developed from this group was tested on the entire database. In this research, two algorithms were evaluated for ECG identification during system development. There are the template matching with LDA neural network model and the fast real-time ECG identification method. The first algorithm provided the identification rate up to 100% accuracy on the development dataset. Then, the identification rate was 95.3% (160 out of 168 persons) when test database with 168 subjects was applied. The second algorithm reduced processing time, and it is suitable for portable medical devices. However, the accuracy rate is also decreased to 89.28%. Hence, Lead-I ECG signals are identify as a valuable biometric for disability population, which can be recommended for future biometric systems used for human identification, personalization, and liveness testing.</p>

<p>17:00-17:15 1D-7</p>	<p>Digital Data Security and Hiding on Virtual Reality VDO 3DGIS-Map Katanyoo Klubsuan, Dr.Surasak Mungsing* <i>Sripatum University, PHD-Information Technology, Thailand</i> * <i>Computer Science Program Faculty of Informatics, Thailand</i></p> <p>Digital Data Security and Hiding on Virtual Reality VDO 3DGIS-Map Today's Information Technology supports varieties of e-commerce, in particular on-demand services such as news, message, seminar and presentation speech to message, and 3DGIS-MAP. Each service can have value-added by embedding other hidden-service within the main service, hence promoting value-added to the service. The value-added services are accomplished by using the technique of Multiple Keys and Messages Embedding (MKME), which hidden-contents can be retrieved only by applying the correct corresponding decryption keys This paper presents the design and algorithm for multiple keys and messages embedding on 3DGIS-MAP, based on Steganography concept. The quality of the resulting product was also investigated.</p>
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DAY TWO - 14th May 2008 (Wednesday)

2A – Rehabilitation Study

08:30 – 09:45

Room A (QP-4)

<p>8:30-8:45 2A-1</p>	<p>Measurement of Motion-related Angular Rate for the Motor Examination of Parkinson's Disease Patients Ji-Won Kim, Jae-Ho Lee, Gwang-Moon Eom, Junghwa Hong *, Byung Kyu Park ** <i>Biomedical Engineering , Konkuk University, Korea</i> * <i>Control & Instrumentation, Korea University, Korea</i> ** <i>College of Medicine, Korea University, Korea</i></p> <p>The purpose of this study is to investigate the angular rate during motor examination of Parkinson's disease patients, as a quantitative measure of the severity. 14 Parkinson's disease patients, 36 healthy elderly subjects and 13 healthy young subjects participated in the experiments. Three different movements selected from the motor examination category of UPDRS i.e. Finger Taps, Rapid Alternating Movements of Hands and Leg Agility test were performed. Frequency and peak angular velocity of swing were derived from the experimental angular rate. Both the frequency and peak velocity showed negative correlation with the clinical score. This suggests that the angular rate can be used for a quantitative measurement of severity in Motor Examination.</p>
<p>8:45-9:00 2A-2</p>	<p>A Preliminary Study: Acoustic Analysis for Parkinson's Disease Patients Focusing on Disease State Supawat Suanpirintr, Nuttakorn Thubthong, Areerat Suputtitada <i>Chulalongkorn University, Thailand</i></p> <p>This paper focuses on a complete four sets of acoustic speech analysis, i.e., fundamental analysis, consonant analysis, vowel analysis, and tone analysis, to study the acoustic characteristics of Thai Parkinson's disease (PD) patients. The effect of disease state or PD state to speech characteristic of PD patients is also investigated. The PD states consist of two levels, i.e., early state and advance state. The results indicate that PD affects patients in term of duration, stability in intensity, stability in consonant time, frequency variability, and tone shape. All patients in early state have better above parameters than those in advance state. Thus it can imply that stability is the large problem for PD patient and the increasing of PD state causes more affect on their speech. This study can be applied for speech assessment or be used for supporting speech training process in the future.</p>

<p>9:00-9:15 2A-3</p>	<p>Quality of Life In Individuals With Transtibial Amputation Using 3 Different Prosthetic Feet Miaojun Hsu, David H Nielsen *, Yaju Chang ** <i>Kaohsiung Medical University, Kaohsiung Medical University Hospital, Taiwan</i> * <i>University of Iowa, USA</i> ** <i>Chang Gung University, Taiwan</i></p> <p>Improvement in quality of life is an important factor to consider when evaluating the efficacy of different types of prosthetic feet. A recently designed prosthesis evaluation questionnaire (PEQ) may be useful in assessing foottype differences. However, no research has been done to substantiate this conjecture. PURPOSE: The purpose of this study was to evaluate foottype differences in quality of life on two energy-storing prosthetic feet, the Flex-Foot (FF) and the Otto Bock 1C40 C-Walk (C-Walk), and a conventional static foot, the Solid Ankle Cushion Heel (SACH), by using two questionnaires, the Short Form Health Survey (SF-36) and the PEQ. SUBJECTS: Eight males with unilateral transtibial amputation participated in this study. METHODS: A preliminary session and three test sessions following one-month acclimation periods with each foottype were required. During each test session, subjects responded to the PEQ and the SF-36 based on their personal use with the specific test prosthetic foot. The scores for each scale of the SF-36 and the PEQ were calculated according to the Manual and Interpretation Guide of the SF-36 Health Survey, and the Guide for the Use of the PEQ, respectively. ANALYSIS: The group means and standard deviations for each scale of the SF-36 and the PEQ for subjects with the C-Walk, the FF, and the SACH were calculated. One-way ANOVA was employed to analyze foottype differences. RESULTS: Generally, the FF and the C-Walk appeared to have better scores compared to the SACH for each scale of the SF-36. However, no significant foottype differences were found. The PEQ showed similar results, however, significant foottype differences were found for the Frustration (FR) and the Usefulness (UF) scales. For the FR, the FF got significantly better scores than the SACH. For the UF, the C-Walk and the FF got significantly better scores than the SACH. CONCLUSION: The SF-36 appeared to be less discriminating than the PEQ for evaluating prosthesis-related quality of life. Based on the significant foottype differences seen on the PEQ scales, the results suggested that the subjects were more comfortable during standing and walking with the FF and the C-Walk, compared to the SACH.</p>
<p>9:15-9:30 2A-4</p>	<p>A Research on the Feasibility of Automatic Fugl-Meyer Assessment for Upper Limb Chongyang Yao, Zixi Wang, Linhong Ji, Lining Chen, Qun Xie <i>Tsinghua University, P.R.China</i></p> <p>Recently, several kinds of rehabilitation devices are designed and applied. These devices can be used both in training and measuring. Together with other technologies, like motion capture system, surface EMG system, rehabilitation devices have a great potential in offering automatic assessment. In this article, after analyzing each item in the Fugl-Meyer assessment score sheet, a plan of automatic Fugl-Meyer assessment has been discussed. As a conclusion, it is feasible to use these rehabilitation devices to shift the traditional Fugl-Meyer assessment to automatic assessment.</p>
<p>9:15-9:30 2A-5</p>	<p>Post-Stroke Training of Finger Coordination with the HandCARE (Cable-Actuated Rehabilitation Equipment): A Case Study Ludovic Dovat, Olivier Lambercy, Berna Salman *, Vineet Johnson *, Theodore Milner <i>National University of Singapore, Singapore</i> * <i>Simon Fraser University, Canada</i></p> <p>Finger extension and coordination are two of the impaired hand functions stroke survivors most desire to recover. We have developed a robotic interface, the HandCARE, to train these functions. The system consists of a Cable-Actuated Rehabilitation (CARE) system in which each finger is attached to an instrumented cable loop allowing force control and a predominantly linear displacement. The interface can assist the subject in opening and closing movements and can be adapted to accommodate various hand sizes and finger shapes. Exercises have been implemented using a motivating approach promoting</p>

	<p>recovery of specific hand functions. To evaluate the training of finger coordination, a post stroke subject practiced for 20 minutes twice a week during six weeks with the HandCARE. The results show significant improvements in finger coordination as well as in movement pattern, i.e. less sub movements during hand opening.</p>
<p>9:30-9:45 2A-6</p>	<p>Clinical Study of Intelligent Balancing Board for Ankle Rehabilitation Jialu Wu, Wenjun Hu, Boon See Cheam *, Wei Tech Ang ** <i>Hwa Chong Institution, Singapore</i> * <i>Singapore General Hospital, Singapore</i> ** <i>Nanyang Technological University, Singapore</i></p> <p>Pro.Blance is the commercialized version of an intelligent balance trainer co-invented by the Nanyang Technological University and Singapore General Hospital. This paper presents a study on the effectiveness of Pro.Blance™ for rehabilitation of people with poor ankle stability and or prior ankle injuries. A group of subjects are recruited. The subjects are randomly allocated into two groups. Both groups undergo the same balancing training protocol for six sessions, with Group 1 using a conventional inflated rubber cushion and Group 2 using the Pro.Blance™. Balancing assessments taken pre and post the training regime have shown significant improvements in the ankle stability for both groups of subjects. At the end of 6 training sessions, some of the subjects are given a chance to sample the other training method. A survey is also conducted to compare the interested generated in both systems. Analysis of the survey shows that this integrated balance trainer not only fulfils its traditionally defined task of strengthening subjects' ankle stability, but also makes them more focus and diligent in the training.</p>

2B – Technology for Visual Impairment

08:30 – 10:00

Room B (QP-5)

<p>8:30-8:45 2B-1</p>	<p>Designing of Vocal Navigation Services for the Blind Kazuo Kamata *, Tatsufumi Imai **, Hiroki Nakajima * * <i>Utsunomiya University, Japan</i> ** <i>Nipponn Signal Co.Ltd., Japan</i></p> <p>This paper presents the results for two single-subject experiments that were designed to obtain: (1) what sorts of objects, spatial and environmental features blind individuals search; and (2) how they utilise them during the travel. We investigate travel behavior for designing vocal guide messages for the blind during the travel. We further discuss issues to be considered thoroughly for designing effective messages. The messages should cope with the variation in travel strategies depending on both orientation and mobility (O&M) skills, and familiarity of the area where they travel.</p>
<p>8:45-9:00 2B-2</p>	<p>Visual Contents Adaptation for Color Vision Deficiency using Customized ICC Profile Young Gun Jang, Hoon Choi II <i>Chongju University, Republic of Korea</i></p> <p>Internationally, 1 person out of 12 persons has color vision deficiency, or "color blindness", as it is commonly called. While the ratio of graphic information in digital contents is continuing to increase dramatically, assistive tools for color vision deficiencies remain scarce. In this study, we developed a method to generate customized ICC profiles for patients suffering from various degrees or types of color vision deficiency, which could adjust graphic contents according to individual needs. Compensation rules for the pale or dark range of red and green colors were established, and an ICC profile was generated using this set of rules. The passing rate for Ishihara test was 99% when the generated profile was applied to 10 Ishihara plates and tested on individuals suffering from red deficiency, and green deficiency (2, and 8 participants, respectively). The time used to generate the</p>

	<p>compensation profile was 13.7 min on average, including the time taken to explain the test to the participants, and reliable results were achieved with relatively low amounts of labor and without the need for expensive instruments, compared to methods currently utilized in professional clinics.</p>
<p>9:00-9:15 2B-3</p>	<p>Braille Music Score Management Environment Ryosuke Abe, Naoyoshi Tamura, Toshiyuki Gotoh, Reiko M. Tachino * <i>Yokohama National University, Japan</i> * <i>The Tokyo Metropolitan Institute of Medical Science, Japan</i></p> <p>This paper proposes a Braille music score management environment. Firstly, we outline the recent situation of Braille music scores and introduce related studies. Next, we discuss requirements for such system, and highlight important view points. Then, we explain the Braille music score management environment system and the interaction between our system and the automatic Braille transcribe system. Finally, we show some window captures of a sample session. By our system, it will be possible to provide Braille music scores via the Internet to the visually impaired and to manage Braille music scores by the volunteer transcribers more easily.</p>
<p>9:15-9:30 2B-4</p>	<p>A Simple Text-based Method of Producing Math/Science Symbols or Musical Notes for Use in a Thai/English Braille Translation Software Wiraman Niyomphol, Pichaya Tandayya *, Wichian Nantachaipitak **, Chaiya Intasoi ** <i>Ratchasuda College of Mahidol University, Thailand</i> * <i>Prince of Songkla University, Thailand</i> ** <i>Ratchasuda College of Mahidol University, Thailand</i></p> <p>An important part of helping blind students in their education is to have text books and reading materials available in accessible format. Braille is one format that is used and is considered essential reading and writing technique for the blind. In order to produce Braille materials quickly, Braille translation software that converts files from print to Braille has been used widely for English and many other languages throughout the world. For the past ten years, material production staff and blind students in Thailand have been using TBT software (Thai Braille Translation) for their Braille production needs. Bringing our Braille translator development experience to another level, the research team at Ratchasuda College of Mahidol University and other important partners began software development work on yet another Braille translator called RS BRAILLE (Ratchasuda Braille). This is comprehensive translation software that converts Thai, English, math, science, and music from print to Braille. Using simple text-based method of typing math/science symbols or musical notes in either Thai or English document, RS Braille can produce literary Braille in Thai and English (in grade 1 or grade 2 with contractions) with several formatting controls. Depending on the materials, standard Braille music or standard math/science NEMETH Braille codes will be incorporated in the Braille output.</p>
<p>9:30-9:45 2B-5</p>	<p>Navigation Systems for Individuals with Visual Impairment: A Survey J Zhang, S K Ong, A Y C Nee <i>National University of Singapore, Singapore</i></p> <p>Individuals with visual impairment have lost the most important perceptive sensory ability in our visually dominated world. To improve their everyday life, assistive technology (AT) for individuals with visual impairment has attracted increasing attention from researchers. Navigation systems for the visually impaired (NSVI) and sensory substitution have been two active research topics. This paper presents a comprehensive survey on the development of NSVI technology in the last five years. Two sensory substitution mechanisms, which have been generally applied in NSVI, are discussed. Three navigation methodologies are presented, namely, positioning system-based, RFID tag-based, and vision-based methods, respectively. A research proposal is presented.</p>

<p>9:45-10:00 2B-6</p>	<p>The Design and Development of Merchandise Selection Guidance System for Helping Visual Disability in a Department Store by Using the RFID Kritsada Boonmewised, Boonchai Sowanwanichkul <i>Chulalongkorn University, Thailand</i></p> <p>The visual disability person Accessible Shopping System aims to make shopping simpler for the visually disability population by giving these shoppers directions to the products on their shopping. Additionally, the system will help ensure that the right products are indeed purchased by providing the necessary functionality to scan and identify the products that the shoppers pick up at the shelf. The system will make use of Text-To-Speech primary output vehicle. Guidance system aims for cost-effective, assistive technologies to provide visual disability person with a greater degree of independence in their daily activities. The overall objective is to improve the quality of life for the visual disability person by harnessing the collective capability of diverse networked embedded devices to support grocery shopping, transportation, etc. This paper describes our research and development of the guidance system, a RFID Tag-based solution comprising components, such as a Pocket PC, Text-To-Speech software and a RFID.</p>
<p>10:00-10:15 2B-7</p>	<p>Sketching and Braille Writing Slate Djody Bascarane, Melan Dass * International Labour Organization, India <i>* National Institute for Visually Handicapped</i></p> <p>Technology is for improvement, The application of technology is acknowledge in every aspect of life and field. In disability sector is one area where technology need to be seriously introduced for the development of education of the visually challenged children. We have taken the advantage of technology in developments that lead us design and development of educational device for challenged children. This project is on development of a new device for the visually challenged children. This was developed with view to make visually challenged children to see through their fingers even complicated sketches as well draft a sketch at his own using sketching and Braille slate. The educators can prepare tactile sketches in the class room situation and also the details (text) of the sketch can be written in Braille. This was developed by us and we used nylon net on the Braille slate for the purpose. This is meant for preparation tactile diagram or free hand sketching of the subjects that are required explanation through sketches. This device was experimented with educators and visually challenged children that has given positive. This new tool was tested on 50 visually challenged children with help of special educators out of that 36 visually challenged children accepted it expressed that is very useful and 10 expressed satisfactory and 4 of them which acknowledged its utility is limited. The results on the device are encouraging and motivated. This has given great impact on visually challenged children education.</p>

2C – Rehabilitation Technology

10:30 – 12:15

Room A (QP-4)

<p>10:30-10:45 2C-1</p>	<p>Developing a Stiffness Treatment Device and Finding an Optimal Treatment Parameter Ya-Ju Chang, Chia-Ying Fang *, Maio-Ju Hsu ** <i>Chang Gung University, Taiwan</i> <i>* Tzu-Hui Institute of Technology, Taiwan</i> <i>** Koahsiung Medical University, Kaohsiung Medical University Hospital, Taiwan</i></p> <p>Hypertonia is one of the major causes of movement disorder in individuals with central nerve system lesion. The cause of hypertonia can be divided into two components, reflexive and non reflexive. The purpose of this study was to design a stiffness treating device utilizing concepts of reducing both</p>
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	<p>reflexive and non-reflexive muscle tone. A custom-made stiffness treating device was developed which oscillated the ankle at various speed from 0 to 3.7 cycles/sec. A force transducer was mounted to measure the real-time total oscillation resistance. Ten individuals with spinal cord injury at levels above T10 participated. Each subject received 8 minutes of repeated contractions elicited by electrical stimulation, oscillation at low speed (1.5 cycles/sec), and oscillation at high speed (3.7 cycles/sec) at 3 consecutive weeks. Maximum electrical stimulation elicited isometric force, M waves, H reflex, and total oscillation resistance were measured before, and at 10 and 20 minutes after the interventions. The results demonstrated a significant fatigue after 8 minutes of repeated contractions. The M waves were not significantly altered after any of the three interventions. The size of H reflex reduced after oscillations at both speeds but not after repeated electrical stimulated isometric contractions. The effects of three interventions on the total oscillation resistance were varied. This study successfully developed a stiffness treatment device which is effective in both the reflexive and non-reflexive components. This stiffness treatment device is not only able to evaluate stiffness but also potentially applicable for rehabilitation purposes. Related mechanisms are discussed.</p>
<p>10:45-11:00 2C-2</p>	<p>Model-Based Feedback Control of a Rehabilitation Robot Markus Knestel, Eberhard P Hofer., Rüdiger Rupp * <i>University of Ulm, Germany</i> * <i>University of Heidelberg, Germany</i></p> <p>In this paper, a model-based nonlinear feedback controller for the ankle joint of a novel motorized orthosis is presented. Powered by artificial pneumatic muscles, this orthosis is designated to work on the lower limbs of patients with neurological disorders. The controller scheme draws inspiration from the innate control strategies of human motor control and is based on model descriptions of the mechanical system, the pneumatical system together with the artificial muscles. The feedback, which includes the inverse models of the mechanical setup and the pneumatic muscles, is used along with the obtained sensor signals to calculate the mass of the moved body. With this obtained pseudo-mass, regular models adulterated by occurring disturbances can be corrected and the required inner air pressures of the artificial muscles for realization of a given trajectory can be calculated. The use of a nonlinear pressure controller derived by back stepping combined with an inverse valve model of the proportional-valves leads to a stabilization of the desired pressures in the muscles and the ability to track the given trajectory.</p>
<p>11:00-11:15 2C-3</p>	<p>Development of a Computer-Controlled Intelligent Physiotherapy System B W Chan, K K Tan <i>National University of Singapore, Singapore</i></p> <p>This paper focuses on the development of a portable Intelligent Physiotherapy system using both hardware (CompactRIO) and software (LabVIEW) from National Instruments. As this system makes use of computer control and programming, it is able to provide a higher level of safety, intelligence, convenience, customisation, and portability and enhanced human-equipment interaction compared to many existing physiotherapy equipment such as gym machines and weights. It is also able to provide objective feedback of the physiotherapy patient's routine; this can lead to more effective treatments as the physiotherapist can make use of the feedback in addition to his professional judgment when analysing the patient's condition. An objective test on the ability of the patient to carry out his routine may also be useful to insurance companies in evaluating the extent of the injury suffered by the patient. Outside the realm of medical treatment, the versatility of the Intelligent Physiotherapy system also makes it ideal as an exercise machine for athletes who want to keep track of their training progresses.</p>
<p>11:15-11:30 2C-4</p>	<p>Analysis and Comparison of Intelligent Control Methods for Microcomputer-controlled Artificial Leg Hong-liu Yu, Xing-san Qian, Ling Shen, Zhan Zhao, Li-xing Shen <i>University of Shanghai for Science and Technology, China</i></p>

	<p>Micro-processor controlled artificial leg, most of which are above-knee prosthesis(AKP) can better adapt to the human gait and walking modes, automatically distinguishing road conditions and coordinate the symmetry of prosthesis speed with healthy leg. Due to the complexity and non-linearity of AKP control model, it is required to design a kind of controller being intelligent enough for it. Research and products development of micro-processor controlled AKP is comprehensively discussed in the paper, The expert controller based on finite-state machine method and BP neural network controller based on PD supervision are especially analyzed. The main intelligent control methods applied for existing AKP products are also compared with each other here. The development of intelligent control technology in future is pointed out.</p>
<p>11:30-11:45 2C-5</p>	<p>An Augmented Reality System for Hand Movement Rehabilitation Y Shen, S K Ong, A Y C Nee <i>National University of Singapore, Singapore</i></p> <p>Virtual Reality (VR) therapy has been successful in various areas of applications. Augmented Reality (AR) is an emerging technology which shares some characteristics with VR. Due to its advantages with respect to VR, it has been used in the field of therapy recently. In this paper, a literature view on the current studies of VR therapy and AR therapy is presented. VR, AR and conventional therapies are compared. Based on the literature review, an AR system is proposed for the rehabilitation of hand movements which have been impaired due to illness or accident. Through the proposed system, the patient can practice daily at home with a standard computer and webcam. Using the AR technology, a highly controllable environment with tasks of different difficulty levels is provided to the patients for them to perform the exercise gradually and systematically.</p>
<p>11:45-12:00 2C-6</p>	<p>Post-stroke Rehabilitation of Forearm Pronation/Supination with the Haptic Knob Olivier Lambercy, Ludovic Dovat, Berna Salman *, Vineet Johnson *, Theodore Milner * <i>National University of Singapore, Singapore</i> * <i>Simon Fraser University, Canada</i></p> <p>This paper presents the results of a preliminary study with two chronic post-stroke subjects using the Haptic Knob, a robotic interface for the rehabilitation of hand function. The robot has two degrees of freedom and adjustable knobs fixed at the output to train grasping/pinching in combination with pronation/supination of the forearm. Game-like exercises have been implemented to promote training of movements used in fundamental activities of daily living (ADL) using suitable dynamic loads and visual feedback. Accurate twisting movements in pronation/supination were trained twice a week for 15 minutes. An increase in the precision of movement was observed with both subjects, and a reduction in the movement duration. The subjects also reported an improvement in performing ADLs.</p>
<p>12:00-12:15 2C-7</p>	<p>Usability Evaluation of an Innovative Platform for Tele-Physiotherapy Jit Biswas, Victor Foo, Mohamed Ali Feki, Siew Yee Lee *, Philip Yap * <i>Institute for Infocomm Research (I2R), Singapore</i> * <i>Alexandra Hospital, Singapore</i></p> <p>The objective of Innovative Platform for Tele-Physiotherapy (IPTP) is to achieve a breakthrough in tele-physiotherapy for elderly patients. "IPTP" is the working name we use in this paper to denote the whole ICT solution that the project provides to support patients and possibly also their primary caregivers. Considering the shortage of prior work in the literature in the area of evaluation based usability of user-centred research projects; this paper describes the objectives and the approach of the evaluation of IPTP. The evaluation approach outlined in this paper will be used to evaluate different field trials at different user sites including patients' homes, and also in the overall project evaluation. This paper proposes a model evaluation strategy. While this model is designed for IPTP, it can be extended to similar research projects relating to the healthcare domain.</p>

2D – Policy & Social Issues

10:30 – 12:15

Room B (QP-5)

10:30-10:45	Orphan Products and Accessible Design Products
2D-1	<p>Shigeru Yamauchi <i>Waseda University, Japan</i></p> <p>In order to avoid confusions in discussions on assistive products basic concepts of assistive products is discussed, together with terminology and definitions. This paper presents a dualistic approach for assistive products.</p>
10:45-11:00	Proposal to Use Mobile Phone Technologies Linked to Online Content Management Systems to Enhance Knowledge Transfer between Community Care Workers
2D-2	<p>Andrew Clark, Catherine Bridge * <i>Newcastle University, Australia</i> * <i>Sydney University, Australia</i></p> <p>This paper explores the possibility of new ways of working for isolated or remote workers who provide community care services to people who are ageing or disabled living in the community. It argues that the mode and use of technology in this case mobile phones, must be consistent with the values and norms of the workers. In particular, the authors argue that social capital theoretical framework is useful tool for understanding and determining the nature and values of community care workers, in this instance allied health care workers. Importantly the paper argues that the traditional PC centric view in ICT and community care in Australia and other developed countries is both incompatible and inconsistent with the workers needs and values, and that new forms of ICT need to be explored, in this case mobile phones. This paper strongly argues that workers generally have the capacity to resolve issues themselves, however, with out appropriate organisation of information no knowledge can be transferred or made explicit. The authors believe that such development will enhance service delivery to people who are ageing and disabled and ensure improved outcomes for both service users and funders.</p>
11:00-11:15	Beyond the wheelchair: Development of motorized transport for people with severe mobility impairments in developing countries
2D-3	<p>Jesse Owens, Chandlar Simonds <i>University of Alaska Anchorage, USA</i></p> <p>In developing countries lack of over-the-road transportation, reduces a vast number of disabled people to a life of begging, dependency, and social isolation. Although there have been some excellent efforts to provide low-cost wheelchairs and hand-powered tricycles, little has been done to further provide transport for disabled people. To address this problem directly we have devised a low-cost motorized wheelchair transporter (the Skeeter) using a combination of bicycle parts, a custom built frame, and an inexpensive small engine for propulsion. This device has the potential to provide a major enhancement in the quality of life for disabled people around the world.</p>
11:15-11:30	Community Services and Social Work For PWD's
2D-4	<p>Muhammad Zeeshan Taqi <i>Association of the Physically Handicapped Adults, Pakistan</i></p> <p>This article discuss about the importance of community services and social work in the lives of PWDs. It elaborates on areas where community services and social work should be focused on to effectively reach out to the PWDs.</p>

<p>11:30-11:45 2D-5</p>	<p>A Framework of Intelligent Disability Services based on Wi-Fi Hotspots and uID Architecture Supachai Vorapojpisut, Pongamorn Amornchaiyagit * <i>Thammasat University, Thailand</i> * <i>NECTEC, Thailand</i></p> <p>This paper presents a framework of intelligent disability services built upon deployed Wi-Fi networks. The framework utilizes the availability of Wi-Fi hotspots in many office buildings and public areas to establish ubiquitous computing environment. Context and service delivery via wireless communication are addressed as an approach for assisting persons with physical retardation. Then, we discuss a framework setting which should facilitate the adoption in both public and private organizations. Finally, a proof-of-concept scenario is developing based on Linux-based Wi-Fi routers and a Wi-Fi mobile phone.</p>
<p>11:45-12:00 2D-6</p>	<p>Assistive Technology in the Global Community – Breaching the Barriers and Building the Bridges in the Asia Pacific with Particular Focus on Thailand Peter Smith, Cathy Caust, Sirirat Ayuwathana * <i>South Australian Department for Families and Communities, Australia</i> * <i>Thailand Department of Social Development and Welfare, Thailand</i></p> <p>This paper begins to "breach the assistive technology divide between east and west" by describing the assistive technology that is being used in Thailand. In particular this paper focuses on the assistive technology being used in services and institutions managed by the Thailand Department of Social Development and Welfare. Examples of assistive technological solutions used by the Foundation for Children with Disabilities (FCD) a non government organization supporting children living with disabilities, will also be described. Background to this paper and the Assistive Technology being used in Thailand Through the support of AusAid Public Sector Linkages Program grant, the South Department for Families and Communities (DFC) has been working with the Thailand Department of Social Department and Welfare (DSDW) to assist them with their deinstitutionalization program. The assistance provided by the SA Department for Families and Communities has included showing the way South Australia has developed its disability and aged care services to the 13 Thai delegates from the Thailand Department of Community Development and Welfare who visited South Australia in August 2007. The policy frameworks which have assisted South Australia with its de-institutionalisation program have been shared. The 13 Thai delegates visited a number of South Australian disability and aged care services so that they could see first hand, the way services are provided in South Australia. The Thai delegates also experienced the day-to-day workings of South Australian agencies through brief work placements. A team of four staff from the Department for Families and Communities subsequently travelled to Thailand in November 2007 and provided training to over 80 service providers, mainly social workers from the Thailand Department of Social Development and Welfare (DSDW). There was a small group of physical therapists who were involved with this training and this paper has relied on their input. This paper concludes that there is a need for culturally and socially appropriate assistive technology in Thailand. This paper suggests that this will be achieved with the guidance and expertise of overseas Rehabilitation Engineers and physical therapists working in collaboration with physical therapists, Rehabilitation Engineers and Service Development Managers from the Thailand Department of Community Development and Welfare (DSDW). The paper suggests that local materials and local manufacturers should be invited to assist with this development of assistive technology in Thailand and that culturally appropriate funding and support programs be developed to ensure that assistive technology is affordable for average families in Thailand.</p>
<p>12:00-12:15 2D-7</p>	<p>Information & Communication Technology for the Social Inclusion of Persons with Disabilities in Developing Country Special Reference to Nepal Sudhir Bikram Shrestha <i>Information & Communication Technology Research Center for Persons with Disabilities, Nepal</i></p>

	<p>In this age of Information and Communications Technology, access to information is a Fundamental human right and most significant driving force of modern development. Due to the innovation in ICT, everyone can benefit irrespective of distance, national and international boundaries. Access to appropriate technology creates adequate opportunity for each individual which is even more relevant and necessary to the Persons with Disabilities for their overall development and employment that opens door for their equality, non-discrimination and participation. ICT has changed the lives of many worldwide; it should also be used for the social inclusion of Persons with Disabilities in developing countries too. In Nepal, which has remote regions that faces many barriers to all, situation for Persons with Disabilities (PWDs) is more exhausting, therefore ICT can act as a major component for the Social Inclusion process. It can help in the equitable participation of the PWDs to access education and income generation, political representation, and social involvement empowering them using ICT based assistive technologies, available computer software and necessary ICT based trainings.</p>
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2E – Computer/Web Accessibility & Special Education

13:30 – 15:00

Room A (QP-4)

<p>13:30-13:45 2E-1</p>	<p>JSL Word Input System For Computers Kazuo Kamata *, Shinya Oguro **, Yoshimasa Seki *** * <i>Utsunomiya University, Japan</i> ** <i>ASLAX Inc., Japan</i> *** <i>Tokyo Welfare Work Society, Japan</i></p> <p>In this paper, we propose a classification method for Japanese Sign Language (JSL) words. The aim of the study is giving certain practical and effective description method for building the tool for manipulating JSL words over computers. We first describe basic idea of our approach to the description method. We then show JSL word classification method that uses a set of description parameters presented. The classification results are also shown when the parameters are applied to 2,454 JSL words.</p>
<p>13:45-14:00 2E-2</p>	<p>A TV Image Expander for the Deaf Ekachai Leelarasmee <i>Chulalongkorn University, Thailand</i></p> <p>To assist the deaf in viewing TV programs with sign images, a TV set top box capable of expanding sign images is developed. Its internal architecture mainly consists of video decoder/encoder, 256Kbytes of video memories, an infrared receiver and an FPGA based video processing unit. The FPGA implements an image expander, an I2C interface plus other control logic. The image expander uses a fixed 2x2 bilinear interpolation coupled with a nearest neighborhood input selection to allow 9 image scaling factors ranging from 1x1 to 2x2. The sign image that can be expanded is of the maximum size of 128x128 pixels or approximately 1/25 of the entire TV screen.</p>
<p>14:00-14:15 2E-3</p>	<p>The Video Communication system via Internet Network for Thai Sign Language Benjaporn Saksiri, Narut Soontranon *, Wechit Kusathitsiriphan ** <i>Mahidol University, Thailand</i> * <i>Shin Satellite Plc., Thailand</i> ** <i>CSG Solution (Thailand) Co. Ltd., Thailand</i></p> <p>In this paper, we developed the telecommunication system via internet network for Thai sign language video [11], which is point to point communication and allocated low bit rate. The purpose is deaf people can be able to communicate between long distance areas and can be applied to E-Learning application. Because of insufficient instructor that can communicate with deaf student. The Tele-conference could be</p>

	<p>better solution which is useful for human resource development. Overall of system, there are three main diagrams of this system which comprise of Transmitter user, Receiver user and Video server. This algorithm serves Thai Sign Language video that includes the system which is skin-color detection model. The model divided into two levels from pixel value such as skin, and background (non skin). The result of detection model is brought in the part of video coding which makes difference coding level. Then, overall system is developed to support low bit rate communication in order to utilize bandwidth of channel and rising efficiently of sign language video communication. Advantages of this system are truly on practicality, low cost implementation and application developer (JMF) [12] which can extend another diagram in the future.</p>
<p>14:15-14:30 2E-4</p>	<p>The Efficacy of Combining Augmented Reality and Music Therapy with Traditional Teaching – Preliminary Results David Hobbs *, Breanna Worthington-Eyre ** * <i>Novita Children's Services Inc., Australia</i> ** <i>Suneden Special School, Australia</i></p> <p>The Virtual Music Instrument (VMI) is an innovative software program that uses movement recognition technology to convert movements into musical sounds. Essentially, it is an Augmented Reality (AR) tool that allows movements to be translated into music, allowing anyone to play a musical note or a whole song with their head, hand or other body-part. In this paper we present the preliminary results and observations of an on-going trial of the VMI system with 8 children with multiple disabilities within a special school environment.</p>
<p>14:30-14:45 2E-5</p>	<p>An Empirical Study of Students' Perceptions on E-Learning Systems Yin-Leng Theng, Ei Ei Tun, Ma May Htoo Zaw, Seint Yee Yee Cho <i>Nanyang Technological University, Singapore</i></p> <p>As e-learning becomes increasingly popular in learning, it is necessary to evaluate students' perceptions on e-learning systems to enhance the quality of the systems. This paper describes a survey on a group of 451 students from a local university using edveNTure, a proprietary e-learning system powered by Blackboard. Using the Technology Acceptance Model (TAM), the study aimed to investigate the factors leading to perceived usefulness, perceived ease of use and behavioural intention to use the e-learning system. This paper concludes with a discussion on the interaction design of e-learning systems from students' perspectives.</p>
<p>14:45-15:00 2E-6</p>	<p>Low Cost Modification of Geometrical Instruments for Physically Challenged Persons Amitav Samajdar <i>AWWA TEACH ME SERVICES, Singapore</i></p> <p>Students with physical challenges in mainstream education have various degrees of difficulty when using geometrical instruments at different levels of education. Rehabilitation professionals often states that there are limited modified geometrical instruments available for students with physical challenges and often these equipments are foreign products and are costly, customized, many a time shipment is delayed and not available everywhere.</p>
<p>15:00-15:15 2E-7</p>	<p>Exploring the Efficacy of IT with Slow Learners : Case Studies in Primary Schools Marissa Wettasinghe, Mazlan Hasan <i>National Institute of Education, Singapore</i></p> <p>This study looks at the implications and changes effected with the introduction of IBM's KidSmart programme into the Learning Support Programme (LSP) in 6 Singapore primary schools. It focuses how the teaching methodologies embraced by teachers working with slow learners (or learners at risk) changed</p>

	with the integration of IT into the classroom. Findings indicated that while all teachers interviewed used IT actively with their learners as a support learning tool, there were still some areas that could be improved to help teachers tap more effectively on the affordances of IT.
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2F – Gerontechnology & Intelligent Environment

15:30 – 17:15

Room A (QP-4)

<p>15:30-15:45</p> <p>2F-1</p>	<p>Web-based Information Needs of the Chinese Senior Citizens: A Singapore Study</p> <p>Yin-Leng Theng, Jacqueline Chia, Mei Yih Lim <i>Nanyang Technological University, Singapore</i></p> <p>Despite the growth of Internet, Internet adoption rate among the elderly in Singapore is still low, especially among the senior citizens. As part of a bigger study, this paper describes a follow-up study to find out the Web-based information needs of Chinese senior citizens in Singapore. It examines the Web-based services used by the elderly; investigates their perception of the Web and study their willingness and/or reluctance to adopt the technology. This study shows that the elderly have a positive perception towards Internet use. However, physical health and well-being and usability issues are seen as potential barriers to the use of Web. This paper concludes with a discussion on the aged, information technology and the Web.</p>
<p>15:45-16:00</p> <p>2F-2</p>	<p>Real-time Elderly Activity Monitoring System Based on a Tri-axial Accelerometer</p> <p>Dong-Won Kang, Jin-Seung Choi, Gye-Rae Tack, Jeong-Whan Lee, Soon-Cheol Chung <i>Konkuk University, Korea</i></p> <p>In this study, we developed the automatic human movement classification system for the elderly using only single waist-mounted tri-axial accelerometer. The system can distinguish several activities such as fall, walking, running, standing, lying and sitting and transition between each movement in real-time. To evaluate proposed algorithm which utilizes the acceleration and tilt information from the sensor module, experiments were performed on ten healthy subjects with several activities such as falls, walking, running, sit to stand, stand to sit, stand to lie, lie to stand, etc. The successful human movement detection rate of the system was 96.1%. For further improvement of the system, it is necessary to include more detailed classification algorithm to distinguish several daily activities and to carry out actual experiments with the elderly.</p>
<p>16:00-16:15</p> <p>2F-3</p>	<p>Home Automation as an Assistive Technology for the Elderly</p> <p>Masi Mohammadi <i>Eindhoven University of Technology, the Netherlands</i></p> <p>Due to the rapid aging of the Dutch population, an increasing demand for adaptable houses is to be expected. The Construction sector can help to improve the senior's level of being independent by developing new types of dwellings. The supply-led market will shift to a demand-orientated market. Home automation gained a lot of interest during the end of the 20th and the beginning of 21st century. Nowadays, discussion concerning the question whether the phenomenon home automation belongs to the architectural field (or not) takes place in the construction industry. Some professionals and architects think automation is concerned with additions to a house which the architect does not need to interfere with. Obviously, a house must offer the performance as required by the inhabitant. That means not only a suitable, safe, comfortable place to live healthy and independently but also the possibility to identify oneself with the house. Home automation can enhance the seniors' level of independence, security and comfort, both physically and mentally. In contrast, too much automation of actions, formerly performed by the senior, is undesirable. Close examination of the senior's needs must be the basic of applying home automation in a proper way. One must be careful of the possible side-effects. A</p>

	<p>balance must be found between the activities performed by the people themselves and by the technology. Applications of home automation need to be a synthesis of the user, technology, healthcare, the house and its surroundings. The aim of this research is quality enhancement of housing of the independently living older citizen by means of the integration of home automation in the architectural design. This integration can be achieved by combining of technology, dwelling and the user.</p>
<p>16:15-16:30 2F-4</p>	<p>A Mini-Study of Singapore Elderly Acceptance to Portable Medical Home Systems William Boon Wee Tan, <i>ITE College West (Dover), Singapore</i></p> <p>Singapore, like many developed countries, is facing an aging population. By 2030, the number of dependents would have increased considerably. In order to provide quality of elderly care by then, care givers must start using technologies to assist them. This paper aims to present current perception of the elderly on portable medical home monitoring devices and systems. Design considerations would be discussed for such a system.</p>
<p>16:30-16:45 2F-5</p>	<p>A Logic Based Approach for Context Reasoning in Assistive Environment Mohamed Ali Feki <i>Institute for Infocomm Research (I2R), Singapore</i></p> <p>Emerging technologies, even if they were not originally designed to be accessible for people having special needs, can often be adapted and integrated into the user's environment (defined as Assistive environment) to increase a dependant person's functioning in today's increasingly technology-mediated world. The objective of this paper is to focus mainly on our research work, which consists on providing a logic-based approach for context reasoning, integrating real daily living tasks, to provide end-users with most suitable accessible services within their environments. To achieve this goal, we have implemented a software architecture based on existing context aware frameworks and toolkits and focused on a reasoning algorithm applied to assistive environment. We provide original context modelling and reasoning taking into account the constraints imposed by the application area in the field of assistive technologies.</p>
<p>16:45-17:00 2F-6</p>	<p>Local Positioning System for Human Tracking Nakarin Paluecha, Poj Tangamchit <i>Control System and Instrumentation Engineering, King Mongkut's University of Technology, Thonburi, Thailand</i></p> <p>We propose a local positioning system that tracks human's movement. The system uses two 3-axis accelerometers mounted at the human's feet to detect steps. An electronic compass is used to obtain an absolute heading. Both step and heading data are combined to plot a movement trajectory on a building floor map based on the dead reckoning method. The system is tested by tracking a closed-loop walking trajectory: starting from a room, walking to another room about 20 meters away, and walk back to the starting point in the first room. The result shows about 2 meters accumulated error from the starting point.</p>

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Tangamchit, Poj	2F-6	Zhang Haihong	1B-6
Tanthanuch, Sawit	1A-7	Zhang, J	2B-5
Taqi, Muhammad Zeeshan	2D-4	Zhao, Zhan	2C-4
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