

Workshop
Advanced Human-Machine Interaction for Improving Quality of
Life and Health
November 21 (full-day), 2018



Booklet

Deadline for poster abstract submission: August 31, 2018

Notification of acceptance: September 15, 2018

Overview:

Human-Machine Interaction (HMI) is one of highly active research areas. It concerns a study of interactions between humans and machines/robots. The HMI technology can be applied to medical applications to improve our quality of life and health. Traditional HMI techniques often generate slow, clumsy, and non-smooth machine/robot responses and interactions. Typically, multimodal information fusion and interaction as well as feedback from clinical experts have not been fully realized. To address all these issues and fulfill clinical needs towards real medical applications, we need to integrate interdisciplinary knowledge across different fields (including, robotics, brain-computer interfaces, natural language processing & speech synthesis, haptic interfaces, artificial intelligence & machine learning, and clinical & behavioral sciences). According to this, our workshop at ICSEC2018 (<https://www.icsec2018.org/>) will bring together experts, working among these fields to present their recent achievements towards “Advanced Human-Machine interaction for Improving Quality of Life and Health”. We will also discuss the challenges and future research directions in this area.

The full-day workshop is composed of the following parts:

- Invited talks by experts from brain-computer interfaces, natural language processing & speech synthesis, haptic interfaces & rehabilitation robotics, and clinical science (orthopedics, spine surgery and spinal cord injury),
- Spotlight poster presentations,
- Discussion and future steps

We are also pleased to invite contributions in the form of 1 page conf. style abstract on (but are not limited to) the following topics. The selected contributions will be presented as 3-mins talks at the workshop and poster presentations during the conference. All abstracts will be included in the ICSEC2018 conference proceedings. In addition, the selected abstracts will be invited to extend for the submission to our opportunity publications as listed below:

Journal of Internet Technology (SCOPUS, ISI (Q2), EI)

Journal of Computers (SCOPUS, EI)

Chiang Mai University Journal of Natural Sciences (SCOPUS, TCI)

Suranaree Journal of Science and Technology (SCOPUS, TCI)

Thai Journal of Mathematics (SCOPUS, TCI)

ECTI Transactions on Computer and Information Technology (ASEAN CITATION INDEX, TCI)

We particularly encourage young scientists to contribute and attend, even presenting their research at an early stage and engage in discussions. Submissions have to be sent to poramate.m@vistec.ac.th in PDF format. One author per accepted workshop contribution (poster) is required to register for the conference to present the accepted submission.

The workshop organizers:

- Poramate Manoonpong, Vidyasirimedhi Institute of Science and Technology, Rayong, Thailand & Nanjing University of Aeronautics and Astronautics, Nanjing, China
- Theerawit Wilaiprasitporn, Vidyasirimedhi Institute of Science and Technology, Rayong, Thailand

The workshop topics include (but are not limited to) the following:

Human-robot interaction,
Human-computer interaction,
Brain-computer interfaces,
Haptic interfaces,
Artificial intelligence and machine learning for human-machine interaction,
Natural language processing & speech synthesis for human-machine communication,
Social and behavioral sciences for human-machine interaction,
Rehabilitation robotics,
Assistive robotics,
Biomedical signal processing and control

Tentative List of speakers:

Thanate Angsuwatanakul (Biomedical engineering, Rangsit University)

Theerawit Wilaiprasitporn (School of Information Science and Technology, Vidyasirimedhi Institute of Science and Technology)

Proadpran Punyabukkana (Computer Engineering, Chulalongkorn University)

Chowarit Mitsantisuk (Electrical Engineering, Kasetsart University)

Winai Chonnaramutt (National Electronics and Computer Technology Center, The National Science and Technology Development Agency)

Chaicharn Akkawutvanich (School of Information Science and Technology, Vidyasirimedhi Institute of Science and Technology)

Suthipas Pongmanee, MD. (Spinal unit, Orthopedics department, Faculty of Medicine, Chiangmai University)

Sintip Pattanakuhar, MD. (Department of Rehabilitation, Faculty of Medicine, Chiangmai University)

Pruittikorn Smithmaitrie (Prince of Songkla University)

Final Program:

9:00 Workshop start

9:00–9:15 Brief Introduction, announcements

Poramate Manoonpong

Brain-computer interfaces for human-machine systems

9:15–9:45 *BCI-Based Human Machine Interaction: Learning and Inspiration*

Thanate Angsuwatanakul (Biomedical engineering, Rangsit University)

9:45–10:15 *Opening the Gate to Continuous SSVEP-Based Brain-Computer Interfaces*

Theerawit Wilaiprasitporn (School of Information Science and Technology, Vidyasirimedhi Institute of Science and Technology)

Spotlight 3-mins talks

10:15–10:45

Self-Regulation Training Game based on Brain Computer Interface (BCI), Thanate Angsuwatanakul et al., College of Biomedical Engineering, Rangsit University

Analysis of Binaural Beats Song based on Instrumental Piano Music: A case-study, Siriyaporn Thanawut et al., College of Biomedical Engineering, Rangsit University

An Investigation of Brain Activity Analysis for Preference Tasks using EEG – fNIRS, Nuntachai Thongpance et al., College of Biomedical Engineering, Rangsit University

Portable EEG Power Meter for Educational Application, Chalermkiat Chunchajiruttikarl et al., College of Biomedical Engineering, Rangsit University

An Efficient Development of the Shoulder Continuous Passive Motion Device, Yutthana Pititeeraphab, College of Biomedical Engineering, Rangsit University

Classification of Eye Movement based on Electrooculography using LED testing sphere, Tasawan Puttasakul et al., College of Biomedical Engineering, Rangsit University

Controlling Prosthesis Hand Based on EMG Signal using Myo Armband, Puwadon Phetnom et al., College of Biomedical Engineering, Rangsit University

Joint Data Training for Motor Imagery-EEG Classification, Rattanaphon Chaisaen et al., Vidyasirimedhi Institute of Science and Technology

Intelligent service robot for effective human – machine interaction, Puchong Soisudarat et al., Vidyasirimedhi Institute of Science and Technology

Spatio-Temporal EEG Motor Imaginary Visualization with GRAD-CAM, Tanut Choksatchawathi et al., Vidyasirimedhi Institute of Science and Technology

Break

Rehabilitation & assistive robotics and haptic interfaces for physical human-machine interaction

11:15–11:45 *RHA Rehabilitation Robotics: Urban and Rural Servicing Robots*

Winai Chonnaramutt (National Electronics and Computer Technology Center, The National Science and Technology Development Agency)

11:45–12:15 *Haptic Human-Robot Collaboration System*

Chowarit Mitsantisuk (Electrical Engineering, Kasetsart University)

Lunch

13:30–14:00 *Neuroprosthetics in Individual with Spinal Cord Injury: Clinical Efficacy and Feasibility in Real-Life*

Sintip Pattanakuhar, MD. (Department of Rehabilitation, Faculty of Medicine, Chiangmai University)

14:00–14:30 *Role of Robotic Technology in Orthopedics and Spinal Disorder*

Suthipas Pongmanee, MD. (Spinal unit, Orthopedics department, Faculty of Medicine, Chiangmai University)

15:00–15:30 *Assistive Robotics*

Chaicharn Akkawutvanich (School of Information Science and Technology, Vidyasirimedhi Institute of Science and Technology)

Break

16:00–16:30 *Robot Human Interaction for Robot@Home*

Pruittikorn Smithmaitrie (Prince of Songkla University)

Natural language processing & speech synthesis for human-machine communication

16:30–17:00 *Accessible Computer Engineering for Human-Machine Communication*

Proadpran Punyabukkana (Computer Engineering, Chulalongkorn University)

Special Talk, Discussion & Closing

17:00–17:30

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