

SIIT - CHIBA

Medical Engineering

Webinar 2022

HOST : BIO-MEDICAL CENTER OF EXCELLENCE AND JSPS CORE-TO-CORE PROGRAM MULTIMODAL MEDICAL ENGINEERING



19th JANUARY

4:00 PM - 6:00 PM (THA)

6:00 PM - 8:00 PM (JPN)



PROF. DR. WENWEI YU
CENTER OF FRONTIER MEDICAL ENGINEERING,
CHIBA UNIVERSITY

Sensing Technology for Dementia Care Support



ASSOC. PROF. DR. PAKINEE AIMMANEE
SIIT, THAMMASAT UNIVERSITY

VP Shunt Entry Area Recommender
(VP-SEAR): A Computer-Assisted
System for VP Shunt Operation



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Meeting ID : 956 2479 1445



CHIBA UNIVERSITY

MEET THE SPEAKERS



Prof. Dr. Wenwei Yu
Center of Frontier Medical Engineering,
Chiba University

Sensing Technology for Dementia Care Support

Dementia care has been a social problem, because of its tough work and lack of caregivers, in many countries. Assistive technology has been expected as one of the solutions. On the other hand, the respect for autonomy: one of the common bioethics principles, needs to be taken into account in not only care service but also care support, which corresponds to a very important concept in nursing care: person centered care. This raises the issue for assistive technology for care support: how to detect dementia persons' physical and mental states, and their desire, intention of daily living activities. This talk will address some of our research efforts of sensing technology for dementia care support, as well as our future direction.

Assoc. Prof. Dr. Pakinee Aimmanee
SIIT, Thammasat University



VP Shunt Entry Area Recommender (VPSEAR) A Computer-Assisted System for VP Shunting

Hydrocephalus is the abnormal accumulation of fluid in the ventricles deep inside the brain. The excess fluid causes the size of the ventricles to increase. Consequently, it generates high pressure on the brain's tissues resulting in brain damage. The remedy of this condition is to perform Ventriculoperitoneal (VP) shunt to drain out the fluid from the patient's brain. Identification of a shunt's entry point is an essential initial step in the VP shunt operation. In this work, a program so called VP Shunt Entry Area Recommender (VPSEAR) is developed to calculate the entry region on a skull from a set of CT scanned slides. This talk will address the procedures and techniques used to accurately identify the shunt's entry point on a skull from a constructed 3D ventricle model of the patient.



Ms. Waranrach
SIIT, Thammasat University and
Graduate School of Science and Engineering,
Chiba University

Using Vital Signs to Predict Mortality of Older Patients in ICU

Mortality prediction for intensive care units (ICUs) is a challenging problem in the area of artificial intelligence. This can help to manage the utilization of resources in ICUs. It also gives an extra opinion for doctor and patient's family in case of palliative care. In scheme of ICU, almost previous studies require laboratory results of many complex parameters to predict the mortality. However, the laboratory results are complex and time-consuming. Therefore, the vital signs are used to be the feature inputs for the prediction model. The vital signs are routinely recorded and define the change of clinical deterioration, which is leading to continuously update and recalibrate to a model. The vital signs of interest in this study are heart rate, respiration rate, oxygen saturation, blood pressure, and temperature.

Ms. Tin Tin Khaing
SIIT, Thammasat University and
Graduate School of Science and Engineering,
Chiba University



Measurement of Choroidal Thickness and Vasculature in Optical Coherence Tomography Images

The choroid is a dense vascular layer between the retina and the sclera. It is an important blood supply to the outer retina. Clinical research reported that there were significant changes in choroidal blood flow in diseased eyes. Understanding changes in choroidal thickness and vasculature is thus critical to monitor the development and progression of retinal diseases. Accurate segmentation of the choroid layer and choroidal vessels in optical coherence tomography images is a requisite to measure choroidal features precisely. This study presents an automatic measurement of choroidal features based on a segmentation model, called ChoroidNET. The details of segmentation and measurement processes and the application of this research in the analysis of retinal diseases will be included in this talk.



Mr. Takayuki Okamoto
Center for Frontier Medical Engineering,
Chiba University

Artifact Reduction for Three-dimensional Projection Data of Sparse-view Micro-CT

Micro-computed tomography (micro-CT) is an imaging modality that enables the acquisition of three-dimensional (3D) structures at the micro-scale non-destructively. Although its high spatial resolution allows us to observe the inner structure, this modality requires a long scan time to obtain high-quality reconstructed images for pathological or tissue specimens. In this work, we adopted a high-speed imaging approach called sparse-view CT to reduce the number of projections. This approach has a problem producing streak artifacts on images reconstructed with analytical algorithms, such as the filtered back-projection or Feldkamp, Davis, and Kress algorithm, due to insufficient projections. This talk will introduce an artifact reduction method for 3D projection data of sparse-view micro-CT. We developed a lightweight deep learning network and evaluated the performance of the proposed method.

1 **Registration** **04:00 - 04:10 PM**
06:00 - 06:10 PM (JPN)

2 **Opening Remarks**
Prof. Dr. Hideaki Haneishi, CFME Director
Chiba University
Prof. Dr. Pruettha Nanakorn, SIIT Director
Photo Session **04:10 - 04:20 PM**
06:10 - 06:20 PM (JPN)

3 **Sensing Technology for Dementia Care Support**
Prof. Dr. Wenwei Yu, Chiba University **04:20 - 04:45 PM**
06:20 - 06:45 PM (JPN)

4 **VP Shunt Entry Area Recommender (VP-SEAR): A Computer Assisted System for VP Shunt Operation**
Assoc. Prof. Dr. Pakinee Aimmanee, SIIT **04:45 - 05:10 PM**
06:45 - 07:10 PM (JPN)

5 **Measurement of Choroidal Thickness and Vasculature in Optical Coherence Tomography Images of Eyes**
Ms. Tin Tin Khaing **05:10 - 05:25 PM**
07:10 - 07:25 PM (JPN)

6 **Artifact Reduction for Three-dimensional Project Data of Spare-view Micro-CT**
Mr. Takayuki Okamoto **05:25 - 05:40 PM**
07:25 - 07:40 PM (JPN)

7 **Using vital signs to predict mortality of older patients in ICU**
Ms. Waranrach Viriyavit **05:40 - 05:55 PM**
07:40 - 07:55 PM (JPN)

8 **Closing Remarks**
Prof. Dr. Stanislav Makhanov **05:55 - 06:00 PM**
07:55 - 08:00 PM (JPN)