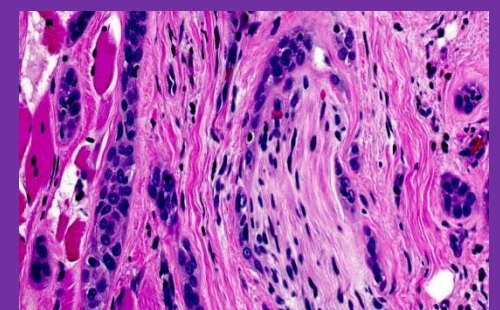
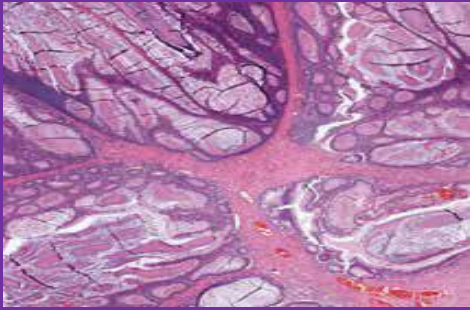


2nd - 3rd April 2019
Tokyo, Japan



Global Engage's Presents:

5th Digital Pathology & AI Congress Asia 2019

Delivering Healthcare Using Digital Pathology and AI for Improved Patient Management

Global Engage is pleased to announce that the 5th Digital Pathology & AI Congress Asia 2019 will be taking place in Tokyo, Japan on the 2nd & 3rd of April 2019.

This highly respected event is a part of our Digital Pathology series with over 200 yearly attendees. The 5th Digital Pathology Congress Asia 2019 aims to bring together professionals from the field of pathology to give talks on digital pathology and all its current topics and advancements, as well as to foster learning and provoke conversations in all matters related to the subject area.

This year our congress will have a special focus on artificial intelligence and its use in pathology together with presentations on medical image analysis and computational pathology among others. To complement the excellent speaker line up, we will also have over 5 hours of networking sessions, panel discussions that will explore the new aspects of this field as well as a diverse exhibition room filled with solution providers showcasing their latest technologies.

STAR SPEAKERS:



Sylvia Asa,
Professor, University of
Toronto, Canada



Ichiro Mori,
Professor,
University of Health &
Welfare, Japan



Brian Lovell,
Professor, The University of
Queensland, Australia



Saroj Mishra,
Professor, Sanjay Gandhi
Postgraduate Institute of
Medical Science, India



Yukako Yagi,
Director of Pathology, Memorial
Sloan Kettering Cancer Center,
USA

Conference Synopsis

DAY 1 STREAM 1	DAY 1 STREAM 2	DAY 2 STREAM 1	DAY 2 STREAM 2
Trends in Digital Pathology	Computational Pathology & Artificial Intelligence	Digital Image Analysis	Digital Pathology Applications & Research Case Studies
- Contemporary issues and barriers of adopting digital pathology - Emerging technology revolving digital pathology - Regulatory overview in digital pathology - Quality assurance, control and improvement - Implementation of digital pathology in training and research - Digital pathology: benefits, barriers and future implication	- Computational methodologies in digital pathology - Approaches and scientific challenges in computational pathology - Development of tools in computational pathology - AI and machine learning - Whole slide imaging: acquisition, processing, archiving and retrieval - Cloud computing / storage solutions	- Challenges and Solutions - Latest Development in DIA - o 3D imaging - o Lens – free Scanning - o Holographic Imaging - User interfaces - Pattern Recognition & annotation Tools - Algorithm Development - Image Analysis Algorithms - Image processing, quality & scanning speed	- User experience - Telepathology - Diagnostic studies - Tissue-based research - Digital biobanking - Technological advances

Speakers



Ichiro Mori

Professor, University of Health & Welfare, Japan



Reem EL Bahtimi

Medical Director
International Dermopath
Consult, Dubai



Rajendra Singh

Associate Professor, Icahn
School of Medicine at Mt.
Sinai



Wael, Al- Zoughbi

Physician – Scientist,
Medical University of Graz,
Austria



Yu Weimiao

Head of Unit, Computational
Bioimage Analysis Institute,
A-Star, Singapore



Brian Lovell

Professor, The
University of
Queensland, Australia



Saroj Mishra

Professor, Sanjay Gandhi
Postgraduate Institute of
Medical Sciences, India



Sylvia Asa

Professor, University of
Toronto, Canada



Mohammad Faizal Fauzi

Associate Professor,
Multimedia University,
Malaysia



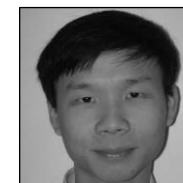
Mattias Rantalainen

Head of Predictive Medicine
Group, Karolinska
University, Sweden



Hanry Yu

Professor, National
University of Singapore,
Singapore



Lee Hwee Kuan

Senior Principal
Investigator, A-STAR,
Singapore



Zhongxi Zheng
Professor, Pathology
Laboratory, West China
Hospital, China



Roberto Verna
Professor, Sapienza
University of Roma, Italy



Tetsuya Tsukamoto
Professor, Fujita University,
Japan



Tomoo Itoh
Professor, Kobe University
Hospital, Japan



Pathmanathan Rajadurai
Doctor, Subang Medical
Center, Malaysia



Jing-Ming Guo
Professor, National
Taiwan University of
Science & Technology,
Taiwan



Yukako Yagi
Director Pathology,
Memorial Sloan Kettering
Cancer Center, USA



Ulysses G. Balis
Director, Division of
Pathology Informatics,
University of Michigan, USA



Aydogan Ozcan
Chancellor's Professor,
University of California,
USA



Matasaka Kawai
Professor, University of
Yamanashi, Japan

Full Agenda – Tuesday 2nd April 2019

DAY 1 TUESDAY 2nd April 2019

8.00-8.50	Morning Coffee & Registration
8.50-9.00	Global Engage & Chair's Welcome Address
9.00-9.30	Keynote Address: Yukako Yagi Director Pathology, Memorial Sloan Kettering Cancer Center, USA Topic To Be Confirmed
9.30-10.00	Keynote Address Lee Hwee Kuan Senior Principal Investigator, A-STAR, Singapore Machine Learning Applications in Digital Pathology Machine Learning and Deep Learning methodologies have been successfully used in digital pathology. Especially in the Deep Learning domain, algorithmic developments is very active. Indeed many algorithm developed for applications outside of digital pathology have been used successfully in digital pathology and hence there is little demand for computer vision methodologies development for digital pathology alone. However, factors affecting the success of applying Machine Learning and Deep Learning on digital pathology goes much beyond the advanced algorithm. In another word, data agnostic approach almost surely lead to failure. In this talk, I will discuss and share some of our experiences in working together with clinicians, learning the domain and how we prepare the data for successful applications of advanced machine learning and deep learning application.
10.00-10.30	Solution Provider Presentation For sponsorship opportunities, please contact Email: reuben@global-engage.com Tel: +603-2117 5193
10.30-11.30	Morning Refreshment
Trends in Digital Pathology Computational Pathology & Artificial Intelligence	
Stream Chair:	Stream Chair:

11.30-11.55	Ulysses G. Balis Director, Division of Pathology Informatics, University of Michigan, USA Topic To Be Confirmed	11.30-11.55	Henry Yu Professor, Department of Physiology, Yong Loo Lin School of Medicine, National University of Singapore, Singapore Development of AI – Based Robust Digital Pathology Approached for Liver Diseases Classification Accurate assessment of liver diseases such as fibrosis and NASH suffer from the data variations of the sampling error, staining and imaging heterogeneity in variable clinical lab settings. Experienced pathologists deal with such variations by comparing with other scoring samples in their memory to generate predictive decisions by selecting useful features and neglecting noises. Accordingly, we have developed machine-/deep-learning algorithms on variable quality and imaging conditions of standard light microscopes, commonly available collagen-stains and variable sizes and quality of biopsy samples. We could accurately detect various stages of liver fibrosis and NASH, even intra-stage cirrhotic changes, and applicable for liver fibrosis caused by different etiologies. Using only conventional collagen and H&E stained liver samples, our approaches makes it possible to quantitatively score liver diseases in fully automated manner and partially correct the sampling error in less sophisticated clinical or laboratory settings and applicable for multi-center collaborations and clinical trials.
11.55-12.20	Ichiro Mori Professor, International University of Health & Welfare, Japan Issues in international WSI full double-check system, from the experience of Health Evaluation and Prevention Center preparation in Vietnam. - We are planning to open Health Evaluation Center in Vietnam with full double check of pathology diagnosis from Japan using WSI. - One of the biggest issues is language. We are planning English base HIS and pathology LIS while we cannot find Japanese company who has running pathology LIS in English. - We are going to check cytology, so how to make cytology remote double check is big issue.	11.55-12.20	Brian Lovell Professor, The University of Queensland, Australia Automated Digital Pathology and Detecting Glomeruli on Renal Direct Immunofluorescence This talk will summarise the outcomes of our 8-year collaboration with Sullivan and Nicolaides Pathology on the commercial automation of several major tests — soon to be deployed globally. I describe the scanning system and the huge benefits achieved by this approach. In the second half of the talk I focus on the use of Artificial Intelligence (AI) and Deep Learning. There is high demand to develop computer aided diagnostic techniques for this new digitized pathology data. The ability to extract effective information from digital slides, which serves as fundamental representations of the prognostic data patterns or structures, provides promising opportunities to improve the accuracy of automatic disease diagnosis. AI can be used to analyze images by providing a better interpretation of the detailed information in digital pathology. We introduce a new benchmark dataset for Detecting Glomeruli on renal Direct Immunofluorescence (DGDl) to advance this field of research.
12.20-12.50	Solution Provider Presentation For sponsorship opportunities, please contact	12.20-12.50	Solution Provider Presentation For sponsorship opportunities, please contact

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12.50-13.50	Networking Lunch		
13.50- 14.15	Roberto Verna Professor, Sapienza University of Roma, Italy Topic To Be Confirmed	13.50-14.15	Rajendra Singh Associate Professor, Department of Pathology & Dermatology, Icahn School of Medicine, Mt.Sinai, USA Reliability and Authentication of Data: Key for Building AI Based Tools and Algorithms There is a lot of hype about artificial intelligence (AI) and deep learning. There are significant anticipated outcomes and possibilities of changing the present workflows in all areas of medicine. Many organizations are attempting to gather open access data or participate in grand challenges in order to supply their armamentarium of machine learning tools. The key to building true clinically relevant models and algorithms that can predict patient outcomes, management, or prognosis is having access to a large amount of patient data. Big data movements are being amassed at many institutions and conglomerate networks. The only hope of building large data sets is when multiple institutions and organizations find a way to share their data as no single institution would have enough diverse data that would help build tools that can be used worldwide. The innate variation of each institution by itself could cause modeling failures when isolated models are built and transferred to other institution data. Gaining access to high quality big data sources, especially open access, will need to have shared data governance, accuracy, and dependability. Open access platforms with deidentification or anonymization will need to provide these principles to support such deliverables. Web based platforms will allow for collaborative annotations made on the data, which will also need to be verified; in order to produce viable models for real clinical practice. Developed algorithms for an atomic pathology practice, research, or education can be shared, trained, and validated in crowd sourced datasets with high variance for reliable modeling. Building such an innovative, interactive, and intuitive workflow will be the first step in fulfilling the role of pathology becoming the center of personalized medicine.
14.15-14.40	Aydogan Ozcan Chancellor's Professor, University of California, USA Topic To Be Confirmed	14.15-14.40	Mohammad Faizal Ahmad Fauzi Associate Professor, Faculty of Engineering, Multimedia University, Malaysia Cancer Diagnosis & Prognosis in Digital Pathology
14.40-15.10	Solution Provider Presentation For sponsorship opportunities, please contact Email: reuben@global-engage.com Tel: +603-2117 5193	14.40-15.10	Solution Provider Presentation For sponsorship opportunities, please contact Email: reuben@global-engage.com Tel: +603-2117 5193

15.10-15.55	Afternoon Refreshments		
15.55- 16.26	Panel Discussion Recognising Significance and Barriers of AI Usage in Pathology The possibilities of artificial intelligence revolutionising the field of pathology is irrefutable, as it makes workflow more efficient and increases productivity in disease diagnosis. However, the implementation of AI has become an issue with limitations in technology in terms of data insufficiency, image quality, standardisation of imaging, data synchronising process and much more. AI is still in its stage of infancy with simple digitised image analysis of using algorithms, data mining, structuring and other menial use. For this reason, the true extent of AI and its benefits have not been fully recognised among pathologists. In this session, the potential of AI and its implications in DP will be discussed.		
16.25-16.50	Pathmanathan Rajadurai Doctor, Subang Medical Center, Malaysia Topic To Be Confirmed	16.25-16.50	Zhongxi Zheng, Professor, Pathology Laboratory, West China Hospital, China AI for Pathology: Towards Automated Biomarkers Analysis in Breast Cancer The biological characteristics of the tumor are used to estimate prognosis and select appropriate therapy for patients with breast cancer. The advent of molecular technology has incorporated new Biomarkers along with immunohistochemical and serum Biomarkers. Immunohistochemical markers are often used to guide treatment decisions, to classify breast cancer into subtypes that are biologically distinct and behave differently. In this paper we will describe a novel deep learning system developed for automatically analyzing four major IHC markers: KI-67, ER, PR, and HER2, we will also provide the information of utilizing this system into clinical practice.
16.50-17.00	Closing Remarks	16.50-17.00	Closing Remarks

Full Agenda – Wednesday 3rd April 2019

DAY 2 WEDNESDAY 3 rd April 2019	
8.00-8.50	Refreshments
8.50-9.00	Track Chairs' Opening Remark
9.00-9.30	Keynote Address: Sylvia L. Asa Professor, Laboratory of Medicine and Pathobiology, University of Toronto, Canada When Digital Pathology Becomes Pathology: Vision 2020 Pathology is being transformed by the disruptive technology of digital scanning that creates whole slide images. While slow to be adopted, the reality of this new digital pathology world was already in play for primary diagnosis in Toronto in 2011. Over the last few years, the workflow of a world without glass slides and microscopes has been the focus of many studies. The requirements for clinical use include either recreating or integrating the many advances that have been made by laboratory information systems to facilitate case handling, prioritization, data collection and reporting. Artificial intelligence algorithms using image analysis provide quality assurance as well as quantitative results and ultimately will assist in interpretation but must be incorporated in a way that enhances quality and expedites case completion in a cost-effective way. This presentation will imagine "A day in the life of a pathologist" in the 2020 world of digital pathology.
9.30-10.00	Keynote Address: Saroj Mishra Professor, Sanjay Gandhi Postgraduate Institute of Medical Science, India Topic To Be Confirmed
10.00-10.30	Solution Provider Presentation For sponsorship opportunities, please contact Email: reuben@global-engage.com Tel: +603-2117 5193
10.30-11.30	Morning Refreshments
11.30-12.00	Panel Discussion Implementation of Open Source Software for Enhanced Image Analysis One of the major setbacks in digital pathology is the apparent lack of software platforms for the analysis of whole slide imaging. Commercial platforms not only are extremely steep in its price point, but also complex to be used. Left with these choices, pathologists often rely on visual estimation for biomarker analysis which is difficult and time consuming. With the development of open source software, image analysis is made much easier. In this session, we will discuss the types and potential of open source software, as well as determine the best software that is available in the market.
Digital Image Analysis Digital Pathology Applications and Research Case Studies	

Stream Chair:		Stream Chair:	
12.00-12.25	Matasaka Kawai Professor, University of Yamanashi, Japan Applied Artificial Intelligence from a Pathological and Engineering Point of View and Data Management in the Next Generation Digital Pathology. Pathology confronts one of the greatest paradigm shifts in these several years; Digital pathology and associated artificial intelligence (AI). First, I introduce the past, present and future of Digital pathology and AI application in pathology from a pathological and engineering point of view. Subsequently, I present progress of deep learning-based AI system for histology and cytology at my facility. Second, I propose problems associated with data management in relation to digital pathology and AI development. Although data availability, maintenance and transfer become more and more important, little attention has been paid in an academic context. I suggest solutions to those problems from technical and ethical aspects.	12.20- 12.25	Kenny Birney Head of IT/ Technical Lead for Scottish National Digital Pathology, NHS, Scotland Implementation of a National Digital Pathology Instance and the Challenge of Enterprise Level Data Storage A discussion on the rollout of a national Digital Pathology system in Scotland with a particular focus on the technical challenges and our work to find cost effective solutions to these challenges on a national scale. In Scotland, we are in the process of rolling out Digital Pathology to enable much greater collaboration and to make more efficient use of a pressured consultant workforce. The technical challenges of a Digital Pathology rollout on this scale are substantial. Solutions must be developed that are sustainable and affordable. This presentation will cover the key challenges we have found and overcome with an expectation that these lessons can be applied elsewhere. The vast amounts of data storage required to support Digital Pathology has been the biggest challenge and our approach to solving this will be outlined in detail.
12.25- 12.55	Solution Provider Presentation For sponsorship opportunities, please contact Email: reuben@global-engage.com Tel: +603-2117 5193	12.25-12.55	Solution Provider Presentation For sponsorship opportunities, please contact Email: reuben@global-engage.com Tel: +603-2117 5193
12.55- 13.55	Networking Lunch		
13.55 – 14.20	Mattias Rantalainen Head of Group, Predictive Medicine Research Group, Karolinska University, Sweden The Prostate Cancer Image Epidemiology Project: Towards Model – Based Histopathology Histopathological assessment of prostate biopsies is the main mode to detect presence of cancer and to identify clinically relevant cancer. However, there is a shortage of pathology expertise and assessments suffer from high inter-assessor variability, causing both over- and under-treatment that can have severe consequences for individual patients. In this project we develop models for histopathology image classification of prostate cancer biopsy slides using deep convolutional neural networks. We address two problems: (1) detection of cancer and (2) Gleason score classification. The study is based on a large population-based cohort, including >80,000 biopsies. Here we report preliminary results from 8,400 whole slide images (>4 million tiles). Our results indicate a high accuracy for detection of presence of cancer in biopsies (AUC=0.99, independent test set), and an ability to perform Gleason score classification with good accuracy. The	13.55 – 14.20	Tetsuya Tsukamoto Professor, Fujita University, Japan Comparison of Fine-Tuning Deep Convolutional Neural Networks for Classification of Lung Cancer Types from Cytological Images Accurate classification of lung cancer types is indispensable to meet recent progress of chemotherapy. We have previously developed an automated classification scheme for lung cancers presented in microscopic images using a deep convolutional neural network (DCNN). In this study, we have evaluated the effect of fine-tuning using AlexNet, GoogLeNet, and VGG-16 DCNN architectures to improve accuracy of classification. AlexNet consists of 5 convolutional, 5 pooling, and 3 fully connected layers; the last layer was modified to classify 3 lung cancer types. Overall accuracy was 75.5%. GoogLeNet possesses 22 layers without fully connected layers with modification to output 3 cancer categories. Accuracy was as low as 70.8%. VGG-16 is constituted with 16 relatively simple layers and resulted in the best value of 76.8% in accuracy. Taking into account these data, fine-tuning, although depending on the architectures, could be useful for classification of lung cancer cytological images.

	results suggest that AI-based decision support may be of importance in future clinical cancer diagnostics.		
14.20-14.45	Jing - Ming Guo Professor, National Taiwan University of Science & Technology, Taiwan Topic To Be Confirmed	14.20-14.45	Tomoo Itoh Professor, Kobe University Hospital, Japan Validation Study on Lymphoma Diagnosis Using WSI The digital pathology is an emerging technology, and its usage on routine practices is spreading worldwide rapidly. Very recently, FDA allowed marketing of first whole slide imaging (WSI) system for digital pathology, which enables us to use the system even for primary diagnosis. This epoch-making achievement owes a lot to scientific evidences indicated that WSI is eligible for making accurate pathological diagnoses. However, those studies typically targeting small specimens alone and the cases requiring immunohistochemistry or special staining, such as malignant lymphoma, were excluded in many studies. This study was done to provide an evidence of usability of WSI diagnosis for primary diagnosis of malignant lymphoma compared to conventional glass slide diagnosis and optical microscope. As a conclusion, we were able to decide that WSI is applicable for primary diagnosis of malignant lymphoma, if we make diagnoses with combination of adequate clinical information, H&E morphology, and immunohistochemistries.
14.45-15.10	Yu Weimiao Head of Unit, Computational Bioimage Analysis Institute, A-STAR, Singapore Recognition of Mitotic Cell Nuclei in H&E Slides: How to Proceed with AI Breast cancer is the commonest malignancy and the leading cause of cancer deaths in females. It can be broadly divided into non-invasive Ductal Carcinoma in situ (DCIS) and invasive malignancies with different subtyping. Cell proliferation is one of the key clinical pathology parameters for patient sample assessment, while it is a tedious and time-consuming step for visual investigation and manual counting. The rapid advancement of artificial intelligence and machine learning demonstrated a great potential in cancer patient diagnosis and treatment. In this talk, we will discuss how the AI and ML can help to improve this quantification.	14.45-15.10	Wael Al-Zoughbi Physician – Scientist, Medical University of Graz, Austria How Digital Pathology Solves Problems in Academic Research Tissue-based research in the era of precision medicine should provide accurate information about Morphomolecular variables. Image analysis solutions can be applied to answer specific scientific questions. The ideal approach is that an expert with histopathological interpretation translates a scientific question to a mathematical formula to be computed and applied to a patch of tissue sections. Our interest in quantitative image analysis rose as a problem-based approach through collaborative projects. The continuous request from our colleagues and scientific researchers to quantify pathological findings—backed by critics from several reviewers to the subjective interpretation—motivated us to explore the Digital Pathology field and, so to say, to attempt to replace the semi-quantitative methods. A number of image analysis solutions will be discussed including a comparison between three image analysis solutions: Aperio, Definiens, and a locally developed solution called IQM. Besides, we will share our experience with validating and operating Multiplex immunohistochemistry (cancer immunology panel) and multispectral imaging technologies to help in cancer patient stratification.
15.10-15.35	Reem EL Bahtimi Medical Director International Dermopath Consult, United Arab Emirates The Role of Digital Pathology in Dermatopathology		

	For over a century, the microscope has been the greatest tool for pathologist. Although, many modifications and improvements have been added to make it more ergonomic, none has changed the work of pathologist like digital pathology. Digital pathology has provided a new era for pathologist. With the improvements of digital cameras, more and more pathologist now depends on them for measurement and documenting pathological criteria. Digital images have become the standard in many Dermatopathology practices, to document the findings and margins. In addition, it allows for offsite evaluation and diagnosis. Dermatopathology, is an ideal specialty for Digital pathology, as most specimens are entirely submitted in one block, so the area for evaluation is small and limited to one slide. This talk will address the correlation between digital pathology and microscopy in the field of Dermatopathology.
15.35-16.00	Invitation Sent
16.00-16.10	Chairs' Closing Remarks and End of Conference