Greetings!

Happy New Year! Wishing you a prosperous year in 2021!

A few important activities took place near the end of 2020. In particular, we held three elections, including the elections of the President-Elect, Vice Presidents, and the members-at-large of the APSIPA Board of Governors. In addition, for the first time, the APSIPA Annual Summit and Conference APSIPA ASC was held in virtual mode from 7 to 10 Dec 2020, which was a great success.

In 2021, Professor Anthony Kuh becomes the APSIPA president while Professor Tatsuya Kawahara takes up the position of President-elect. In this issue, you will find Prof. Kuh's message. We would also like to take this opportunity to thank the Immediate Past President - Prof. Hitoshi Kiya, for serving as the President of APSIPA from 2019 to 2020.

Don't forget that the 13th APSIPA ASC 2021 will be held in Tokyo, Japan this year from 14-17 Dec. 2021. The submission deadline for proposal of special sessions is 1 April 2021, and the submission deadline for the regular and special session papers are 1 July 2021. More information is available at http://www.apsipa2021.org/.

Lastly, we invite you to send us your contributions to be published in the APSIPA Newsletter. You are also welcome to share your thoughts with us about future developments in this newsletter. Please enjoy reading this issue!

A/Prof. KokSheik Wong
EiC
Monash University Malaysia
Malaysia

In this issue

Message from the President, APSIPA

Professor Anthony Kuh
University of Hawai`i

It is my great honor to serve as President of the Asia Pacific Signal and Information Processing Association (APSIPA) for 2021-2022. I look forward to working with the Board of Governors BoG, Advisory Board, and members of APSIPA to continue strengthening and growing our association. We have been very fortunate to have strong leadership that started from our founding President, Sadaoki Furui, followed by past Presidents Jay Kuo, Haizhou Li, Wan-Chi Siu, and founding member and organizer, Ray Liu. I would also like to thank Hitoshi Kiya who served as President of APSIPA for the last two years. He provided critical leadership in guiding APSIPA and was instrumental in promoting many activities including introducing APSIPA local chapters (Japan, Taiwan, and the United States established local chapters).

In December, 2020 we had a very successful 12th APSIPA Annual Summit and Conference that was originally scheduled to be held in Auckland, New Zealand, but was held virtually. The conference also had a summer school that took place after the conference finished. Thank you to the general chairs: Waleed Abdulla, Jay Kuo, Tatsuya Kawahara, and the entire organizing committee for their great work in running a terrific conference and their work in transitioning the conference from an onsite conference to a virtual conference. The virtual format provides new opportunities for APSIPA to reach out to our community in providing services including future conferences, workshops, seminars, meetings and summer schools. In the publication area we are also transitioning the APSIPA Transactions on Signal and Information Processing from Cambridge University Press to a new publisher and are working with publishers on a new APSIPA series of Open Access books. We also look forwards to continuing and new activities for APSIPA membership including workshops and seminars through local chapters, workshops from the technical committees, distinguished lectures, seasonal schools, and more industry activities and collaborations.

We have built a solid core of membership for APSIPA over the last eleven years. Our conference has been very successful with record number of attendees in the last four years. We look to continue to build our membership over the next few years, especially in obtaining more diversity: geographic (encourage members from more underrepresented countries), women, early career researchers (students, postdocs, junior faculty), and industry members. Building our membership will depend on building our technical and social relationships. Information will be distributed through this newsletter and also the APSIPA website. The APSIPA website will also serve as a repository for giving members access to videos from APSIPA keynote speeches, tutorials and distinguished lectures and provide additional benefits. APSIPA will continue to be at the forefront of signal and information processing research and we are well positioned to provide leading research in key research and technology areas such as machine learning and data science. Our newest Technical Committee (TC) is the Machine Learning and Data Analytics (MLDA) TC.

Finally, we note that while this past year has been a most challenging year with the coronavirus pandemic, economic crisis, social injustice, and ongoing climate change, with the introduction of approved vaccines for COVID-19 and their distribution, there is optimism for a much more promising 2021. I look forwards to working with APSIPA members in improving our services and providing a growing community to afford opportunities to learn, educate, and collaborate. If you have any questions, comments, or suggestions please feel free to contact me.

Best wishes for a safe and happy new year,

Aloha,
Tony Kuh

Election Results

APSIPA relies on the services and contribution from the APSIPA Board of Governors as well as support from all APSIPA members. Elections for the following President-Elect, Vice Presidents and Members-at-Large of the APSIPA BoG have been conducted near the end of 2020. We are pleased to share with you the following election results.

President Elect
Prof. Tatsuya Kawahara
Kyoto University, Japan.

Vice President – Education
Prof. Mingyi He
Northwestern Polytechnical University, China.

Vice President – Technical Activities
Prof. Yih-Fang Huang
University of Notre Dam, USA.

Members-at-large

Prof. Nam Ik Cho
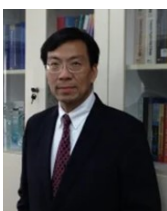Seoul National University,
Korea.

Prof. Isao Echizen
National Institute of
Informatics, Japan.

Prof. Jing-Ming Guo
National Taiwan University of
Science and Technology, Taiwan.

Prof. Bonnie Law
Hong Kong Polytechnic
University, Hong Kong.

Prof. Gwo Giun (Chris) Lee
National Cheng Kung University,
Taiwan.

Prof. Antonio Ortega
University of Southern
California, USA.

APSIPA Sadaoki Furui Prize Paper Award

Professor Sadaoki Furui was the APSIPA founding president (2009 to 2012). In 2015, Professor Furui kindly donated a sum of US$25,000 to APSIPA. The donation is used to promote and recognize high quality papers published in the APSIPA Transactions on Signal and Information Processing, through establishing a "best paper award", named APSIPA Sadaoki Furui Prize Paper Award. We are pleased to announce that the 5th APSIPA Sadaoki Furui Prize Paper Award was given to:

Evangelos Alexiou, Irene Viola, Tomas M. Borges, Tiago A. Fonseca, Ricardo L. de Queiroz, and Touradj Ebrahimi,
A comprehensive study of the rate-distortion performance in MPEG point cloud compression.
APSIPA Transactions on Signal and Information Processing, Volume 8, 2019, e27
DOI: https://doi.org/10.1017/ATSIP.2019.20

Congratulations to the recipients!

Call for papers of Special Issue in APSIPA T-SIP

Special Issue: Deep Neural Networks: Representation, Interpretation, and Applications

Brief description:

Deep learning has been a popular research area in artificial intelligence with many applications in various of fields, such as object detection and recognition, and multimedia data understanding, restoration, and synthesis. Moreover, deep learning has also played a critical role in data science, especially for analyzing big data relying on the extractions of high-level abstractions for data representations through a hierarchical learning process. In realizing deep learning frameworks, both supervised and unsupervised approaches for training deep neural networks have been empirically investigated and applied in different applications. However, there is still very limited understanding on why deep networks can work well and how to design efficient deep models in the viewpoints of software and hardware. Moreover, for embedding deep models into mobile applications, efficient representation or compression of model parameters for model storage is also highly required. This special issue will focus on all aspects of deep learning in representation, interpretation, and applications. The special issue is mainly extended from the special session on Recent Advances in Deep Learning with Multimedia Applications of APSIPA ASC 2020 conference, but any other significant contributions in the related fields are also welcome. Topics of interest include, but are not limited to:

- Interpreting and Understanding Deep Neural Networks
- Deep Model Compression and Representation
- Deep Representation Learning with Multimedia Applications
- Deep Learning-based Multimedia Data Synthesis
- Deep Learning for Big Data Analytics
- Hardware Acceleration for Deep Learning

Editor(s) of the special issue:

Dr. Li-Wei Kang (National Taiwan Normal University, Taiwan)
Dr. Chia-Hung Yeh (National Taiwan Normal University, Taiwan)

Schedule:

- Submission Deadline: 30 June 2021
- First Review Decision: 15 August 2021
- Revisions Due: 30 September 2021
- Final Decision: 15 October 2021
- Final Manuscript: 1 November 2021
- Expected publication date: January 2022

Call for papers of Special Issue in APSIPA T-SIP

Title: Information Processing for Understanding Human Attentional and Affective States

Brief description:

Recent advances in sensing technology allow us to access various physiological signals such as eye movements, brain activity, and so on. While there are many reports suggesting that those signals reflect our attentional and affective states, it is still a challenging issue to estimate those states from the physiological signals recorded during a behavioral task, mainly because of individual variability and motion artifacts. The special issue calls for papers that discuss the methods to solve the issues and their application to estimate human attentional and affective states. In addition to those topics, we welcome papers that address basic studies (e.g. model simulations, animal experiments, brain-inspired computing and so on) as long as they are related to the regulation of attentional and affective states.

List of topics include but not limited to:
- Behavior analysis of human and animals
- Biological signal processing
- Biomakers for mental disorders
- Brain-inspired computing
- Estimation/prediction of attentional and affective states
- Psychometric indices

Editor(s) of the special issue:

Junichiro Yoshimoto (Nara Institute of Science and Technology, Japan)
Takatomi Kubo (Nara Institute of Science and Technology, Japan)
Unaizah Obaidellah (University of Malaya, Malaysia)
Kenji Yokotani (Tokushima University, Japan)
Kentaro Katahira (Nagoya University, Japan)
Yuki Maruno (Kyoto Women's University, Japan)

Schedule:

- Submission Deadline: 30 June 2021
- First Review Decision: 15 August 2021
- Revisions Due: 15 October 2021
- Final Decision: 30 November 2021
- Expected publication date: 31 December 2021

**IEEE HK Section
Lecture Series on
Continuing   Education**

4-Days IEEE joint Tutorial/Workshop on Deep Learning (Part 2):
2-Day IEEE Workshop on Deep Learning
Date: Friday-Saturday, 19-20 March 2021 (Virtual Workshop)

Program Schedule

Session 1: Friday, 19 March 2021, 9:00am-12:00nn
Session Chair: **Prof. Wan-Chi Siu**, *PhD, DIC, Life-FIEEE*

Opening Speech: **Dr. Paulina Y. Chan**, *PhD, DIC, MBA, SrMIEEE,* Chair of IEEE Hong Kong Section (3 minutes)

1. Deep Learning Baseline Model Design with sample application to Super-Resolution Imaging
Prof. Wan-Chi Siu, *PhD, DIC, Life-FIEEE, APSIPA Distinguished Lecturer*
Emeritus Professor, Hong Kong Polytechnic University & Research Professor CIHE

2. How to get Clear Vision in the Rain and Haze Environment using Deep Learning?
Dr. Lap-Pui Chau, *PhD, FIEEE*
Associate Professor, Nanyang Technological University, Singapore

Session 2: Friday, 19 March 2021, 1:30 -6:00pm
Session Chair: ***Dr. Paulina Chan***, *PhD, DIC, SrMEEE,* Chair IEEE HK Section

3. Few-Shot Learning: Three Examples
Prof. Changshui Zhang, *PhD, FIEEE, APSIPA Distinguished Lecturer*
Professor, Tsinghua University

4. "Edge Learning for Distributed Big Data Analytics: Theory, Algorithm and System Design"
Prof. Song Guo, *PhD, FIEEE,*
Professor, Computing, The Hong Kong Polytechnic University

5. Computational and Learning Aspects of DNA Sequences
Dr. Bonnie NF Law, *PhD, SrMIEEE*
Associate Professor, Hong Kong Polytechnic University

Session 3: Saturday, 20 March 2021, 9:00am-12:00nn
Session Chair: ***Prof. H. Anthony Chan***, *PhD, FIEEE*

6. Deep Learning for Computational Manga
Prof. Wong, Tien-Tsin, *PhD, FHKIE, MIEEE*
Professor, CS & Eng, The Chinese University of Hong Kong

7. Deep Learning for Speaker Recognition
Prof. Man-Wai Mak, *PhD, SrMIEEE,*
Professor, EIE, Hong Kong Polytechnic University

Organizers*:*

  Prof. Wan-Chi Siu *(PhD, Life-FIEEE),*
 **Prof. H. Anthony Chan** *(PhD, FIEEE),*
  Dr. Paulina Chan *(PhD, Chair, IEEE HK Section)*

Sponsors: IEEE HK Section/HKS Life Member Affinity Group, APSIPA/ APSIPA Distinguished Lecturer Program, Caritas Institute of Higher Education, TeleEye Founders' Charity Foundation, UGC/IDS(R)11/19

Fee: Free Registration

For Limited Quota, Priority is given to members of sponsoring organizations. Hence ***make Early Registration***.
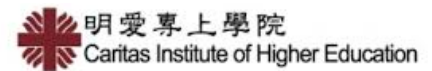
Click here to Register for Part 2, **IEEE Workshop on Deep Learning Web:** https:// cis.cihe.edu.hk/workshop.html#02
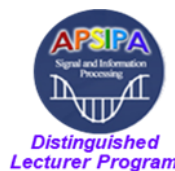
Click here to Register for Part 1:
https://cis.cihe.edu.hk/workshop.html#01
a 2-Day Tutorials on Deep Learning, which is a course for those who have very limited background on Deep Learning, 5-6 Feb. 2021.

IEEE HK Section
Lecture Series on
Continuing Education

2-Day IEEE Workshop on Deep Learning

Opening Speech

Friday, 19 March 2021, 9:00-9:03am

Dr. Paulina Yenbic Chan 陳彥碧博士, *PhD (Imperial), DIC, MBA (London U), SrMIEEE, CCMI, CMgr (CMI UK);* Chair, IEEE Hong Kong Section

Contact Number: +852 95271128   Email: paulinaue@aol.com

Abstract: Continuing Education is an indispensable part of the professional life of an engineer. We have to constantly learn and acquire new knowledge in order to carry out our duties. I am particularly glad to introduce this IEEE Hong Kong Section Lecture Series on Continuing Education, which not only fulfills the actual need for updating the knowledge and skills of engineers in this fast technology development era but also supports the Government's ambition to make Hong Kong one of the smart cities in the world. Particular thanks are given to Caritas Institute of Higher Education and TeleEye Founders' Charity Foundation for their generous financial sponsorship and the Caritas Institute of Higher Education for taking the lead in organizing this event. We also want to thank the technical co-sponsorship provided by APSIPA (Asia-Pacific Signal and Information Processing Association), APSIPA Distinguished Lecturer Program, IEEE Hong Kong Life-Member Affinity Group and The Hong Kong Polytechnic University. This is only the start of our Continuing Education Program. We hope in the near further we can mount more of these programs in Deep Learning and other emerging areas. We sincerely hope to have your support.

Speaker: Dr Paulina Chan is Chair of IEEE Hong Kong Section (2020 and 2021), General Chair of IEEE TENCON 2022, the Founding Chair of Imperial Women in World DSP and she was Chair of IEEE Hong Kong WIE (2019). Dr Chan is also a Chartered Manager (CMgr), CMI Companion (CCMI), Trustee on the Board of Governors of the Chartered Management Institute (UK) and Chair of the CMI Regional Board in Hong Kong.

Paulina is Principal and CEO of Global Mutual Innovation Consortium- a think-tank of multidisciplinary professionals and start-ups in multiple countries focusing on the translation and applications of novel technologies in STEM and Tech-Biz Intelligence into products and services, such as mobile communications network, Artificial Intelligence and Big Data, Smart Cities and Smart Buildings, green energies, and forward-looking health-tech and ed-tech. Over the years, more than ten angel network collaborations and cloud funding entrepreneur ventures have been set up in various EU member states, Hong Kong, and China.

Dr Chan was in senior management in AT&T/Lucent Technologies in the US, Exxon/Mobil Corporation in New York, ICO Global Communications London and Beijing, and EU for Hungary.

As the Founding Champion of Imperial College London Mentoring Programme (2013-present), Dr Chan has contributed a lot of her time and energy to guide young scientists, technologists, engineers and managers-in-training to develop career paths and personal growth.

*IEEE HK Section
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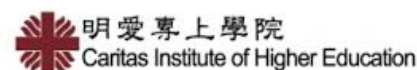
2-Day IEEE Workshop on Deep Learning

Deep Learning Baseline Model Design with Sample Application to Super-Resolution
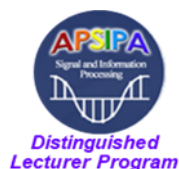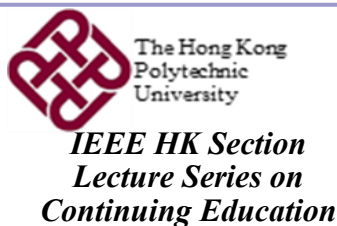
Friday, 19 March 2021, 9:03-10:30am

Prof. Wan-Chi Siu, *PhD, DIC, Life-FIEEE, APSIPA Distinguished Lecturer*

Abstract: There are always large demands for more suitable and efficient machine learning techniques for hi-tech applications. In this talk we will start with a brief review of the architecture of a standard deep learning network for classification, and image to image applications. Many possible approaches can possibly be used to achieve improvement of the architecture of the deep learning structure, which include making novel improvement on the design of the baseline model, information aggregation, resolving the conflict between optimization and generalization and normalization approach of deep learning algorithms, etc. For the present presentation, we will just concentrate on the study of baseline models for deep learning, and will give a brief discussion on the evolution of building blocks for deep learning architectures. We will then proceed with the discussion of some currently proposed baseline models. The techniques can be used as a reference for those who want to design their own deep learning networks for specific applications. At the end of the discussion we will briefly talk about our proposed baseline models making use of joint back projection and residual network for image super-resolution. Demonstrations and experimental results will be provided to show the effect of the new design, and research trend along this direction will also be discussed.
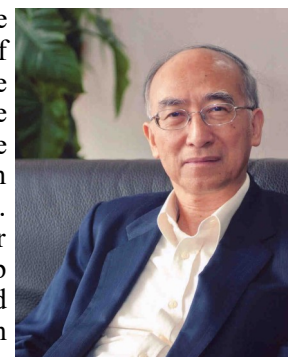
Speaker: Wan-Chi Siu received the MPhil and PhD degrees from The Chinese University of Hong Kong in 1977 and Imperial College London in 1984. He is Life-Fellow of IEEE and Fellow of IET, and was Past President (2017-2018) of APSIPA (Asia-Pacific Signal and Information Processing Association). Prof. Siu is now Emeritus Professor of the Hong Kong Polytechnic University, Research Professor of Caritas Institute of Higher Education, and Distinguished Lecturer of APSIPA. He was Chair Professor, Founding Director of Signal Processing Research Centre, Head of Electronic and Information Engineering Department and Dean of Engineering Faculty of The Hong Kong Polytechnic University. He is an expert in DSP, transforms, fast algorithms, machine learning, and conventional and deep learning approaches for super-resolution imaging, 2D and 3D video coding, object recognition and tracking. He has published 500 research papers (over 200 appeared in international journal papers), and edited three books. He has also 9 recent patents granted. Prof. Siu was an independent non-executive director (2000-2015) of a publicly-listed video surveillance company and convenor of the First Engineering/IT Panel of the RAE (1992/93) in Hong Kong. He is an outstanding scholar, with many awards, including the Best Teacher Award, the Best Faculty Researcher Award (twice) and IEEE Third Millennium Medal (2000). Prof. Siu has been Guest Editor/Subject Editor/AE for IEEE Transactions on Circuits and System II, Image Processing, Circuit & System for Video Technology, and Electronics Letters, and organized very successfully over 20 international conferences, including IEEE society-sponsored flagship conferences and as TPC Chair of ISCAS1997 and General Chair of ICASSP2003 and General Chair of ICIP2010. He was Vice-President, Chair of Conference Board and Core Member of Board of Governors (2012-2014) of the IEEE Signal Processing Society, and has been a member of the IEEE Educational Activities Board, IEEE Fourier Award for Signal Processing Committee (2017-2020) and some other IEEE Technical Committees

IEEE Hong Kong Section

The Hong Kong Polytechnic University

明愛專上學院 Caritas Institute of Higher Education

IEEE HK Section
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APSIPA Signal and Information Processing

2-Day IEEE Workshop on Deep Learning

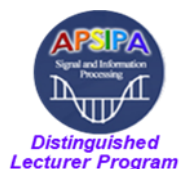# How to get Clear Vision in the Rain and Haze Environment using Deep Learning?
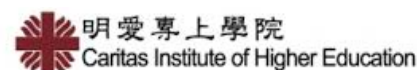
Friday, 19 March 2021, 10:30am- 12:00nn

Dr. Lap-Pui Chau, *PhD, FIEEE*

Abstract: Rain and Haze removal is important for improving the robustness of outdoor vision-based systems. Current rain removal methods show limitations either for complex dynamic scenes shot from moving camera. In this talk, we cover a de-rain algorithm which applies deep learning and super-pixel segmentation to decompose the scene into depth consistent units. Alignment of scene contents is done at the super-pixel level, which proves to be robust towards rain occlusion and camera motion. Besides, outdoor images suffer from contrast degradation caused by fog and haze. We will discuss how deep learning framework can be used to mitigate the contrast degradation.

Speaker: Dr. Lap-Pui Chau works in School of Electrical and Electronic Engineering, Nanyang Technological University. He was the Chair of Technical Committee on Circuits & Systems for Communications (TC-CASC) of IEEE Circuits and Systems Society from 2010 to 2012. He served as associate editors for five IEEE journals. Besides, he was an IEEE Distinguished Lecturer for 2009-2016

APSIPA Signal and Information Processing
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# Few-Shot Learning: Three Examples

Friday, 19 March 2021, 10:30am–12:00nn

Prof. Changshui Zhang, *PhD, FIEEE;* APSIPA Distinguished Lecturer

Abstract: Deep learning has achieved great progress in recent years. However, its huge demand for labelling information often overburdens engineers. In this talk few shot learning is focused. First, I will give a short tutorial on Few-Shot Learning. Then I will introduce our works on Few-Shot Learning. 1. We use the structure of dataset to implement a Self-reinforcing Unsupervised Matching algorithm. 2. We use the knowledge of the Chinese characters and encode a character to a vector, and learning the map from a character image to the vector. 3. We separated and build an illumination base, and augment the feature of an image with the base.

Speaker: Changshui Zhang (Fellow, IEEE) received the B.S. degree in mathematics from Peking University, Beijing, China, in 1986, and the M.S. and Ph.D. degrees in control science and engineering from Tsinghua University, Beijing, in 1989 and 1992, respectively. He joined the faculty of Department of Automation at Tsinghua University in 1992, where he is currently a Professor. His current research interests include pattern recognition, machine learning and computer vision. Prof. Zhang has authored more than 200 articles. He received Best Short Paper Award from the 2016 IEEE International Conference on Healthcare Informatics (ICHI), and the 2013 National Teaching Achievement Award, the highest national award for excellence in teaching in China. He served as a Standing Council member of the Chinese Association of Artificial Intelligence, General Co-Chair for 2017 IEEE Signal and Data Science Forum (SIDAS) that was technical co-sponsored by APSIPA, and a Member of the inaugural IEEE SigPort Board and Student Services Committee of IEEE Signal Processing Society. He has served on the Technical Program Committees of ICIP, NIPS, ICML, ACM SIGKDD, among others, and currently an Associate Editor of the IEEE Transactions on Pattern Analysis and Machine Intelligence. He was elected IEEE Fellow for his contributions to machine learning and signal processing.

IEEE HK Section Lecture Series on Continuing Education
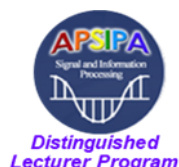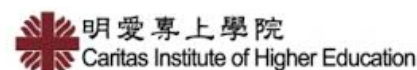
2-Day IEEE Workshop on Deep Learning

# Edge Learning for Distributed Big Data Analytics: Theory, Algorithm and System Design
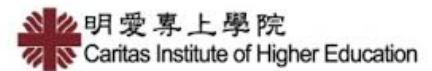
Friday, 19 March 2021, 3:00-4:30pm

Prof. Song Guo, *PhD, FIEEE*

Abstract: This talk will focus on the field of Edge Learning. Specifically, learning paradigms, fundamental theories, and enabling technologies for Edge Learning consist the main components of this tutorial. We will first explain the background and motivation for AI running at the network edge. Then, we will review the challenge issues existing in Edge Learning. Furthermore, we will provide an overview of the overarching architectures, frameworks, and emerging key technologies for learning performance, security, privacy, and incentive issues toward training/inference at the network edge. Finally, we will discuss future research opportunities on Edge Learning.

Speaker: Song Guo is a Full Professor in the Department of Computing at The Hong Kong Polytechnic University. He also holds a Changjiang Chair Professorship awarded by the Ministry of Education of China. His research interests are mainly in the areas of big data, edge AI, mobile computing, and distributed systems. He has published over 500 papers in major journals and conferences and been recognized as a Highly Cited Researcher (Web of Science). He is the recipient of over 12 Best Paper Awards from IEEE/ACM conferences, journals and technical committees. He is the Editor-in-Chief of IEEE Open Journal of the Computer Society and the Chair of IEEE Communications Society (ComSoc) Space and Satellite Communications Technical Committee. He has served on IEEE ComSoc Board of Governors, IEEE Computer Society on Fellow Evaluation Committee, and editorial board of a number of prestigious international journals like IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Cloud Computing, IEEE Internet of Things Journal, etc. He has also served as chair of organizing and technical committees of many international conferences. Prof. Guo is an IEEE Fellow and an ACM Distinguished Member.

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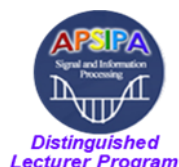
2-Day IEEE Workshop on Deep Learning

Computational and Learning Aspects of DNA Sequences

**Friday, 19 March 2021, 1:30-3:00pm**

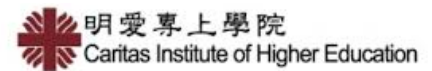**Dr. Bonnie Law,** *PhD, SrMIEEE*

Abstract: A DNA sequence is an extremely long sequence containing every living organism's genetic composition on this planet. DNAs have fast been accumulated and the sizes of databases storing them expanded significantly in recent years. From 1982 to now, the number of nucleotide bases in GenBank was doubled approximately every 1.5 years. It is thus essential to develop effective techniques to study DNA sequences.

The sequencing technologies allow DNA to be represented as a long chain composing of four nucleotide bases: Adenine, Cytosine, Guanine and Thym ine. Computational methods can be useful for extracting knowledge from this character sequence. For example, the gene region in a DNA sequence is often linked to our physical traits. Its length is not fixed and varies from species to species. It can also appear at different parts of a DNA sequence. A critical problem in DNA analysis is to identify their exact location. Various computational methods have been developed for gene location detection using features such as position asymmetry and three-periodicity property. To improve the detection accuracy, a learning approach has been developed. In particular, features from DNA sequences are extracted and fed into the learning algorithm so that the learned model can identify the gene location. Recently, deep models such as convolutional neural networks have been proposed for gene location detection.

In this talk, an up-to-date account of recent research done in DNA sequence analysis is given. We will highlight the principles and results of different learning-based methods, including traditional machine learning-based methods and the recent deep learning methods. The talk will be beneficial to individuals interested in DNA compression and general signal processing researchers who many want to know more about DNA compression methods.

Speaker: Bonnie N.F. Law received the BEng (Hons) degree with first-class honors from the University of Auckland, New Zealand in 1993 and the Ph.D. degree from the University of Tasmania, Australia in 1997. Her research interests include image forensics, machine learning, and image/signal processing. Dr. Law has published over 80 research papers, 40 of which appeared in international journals, such as IEEE Transactions on Image Processing and Pattern Recognition. She has also extended her study into various new applications, such as in information security and bioinformatics. The former includes source camera identification, network traffic anomaly detection, malware and phishing detection. The latter involves works on gene expression and DNA sequence analysis.
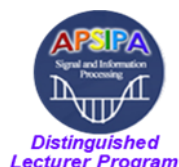
IEEE HK Section
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Continuing Education

2-Day IEEE Workshop on Deep Learning

Deep Learning for Computational Manga

Saturday, 20 March 2021, 9:00-10:30am

**Dr. Prof. Tien-Tsin Wong,** *PhD, FHKIE, MIEEE*

Abstract: With the wide popularity of portable devices, youngsters are moving away from reading paper-based manga to digital manga on tablet, from static manga to power point-style animated manga, and from traditional 2D anime to stereoscopic anime. All these changes raise a lot of technical problems on how to process legacy manga and anime, in order to be digitally presented in a modern form.
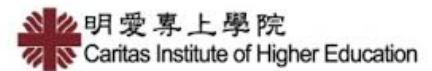
In this talk, I will present how deep learning can be applied to manga industry for higher productivity and efficiency. We start with early handcrafted methods for solving manga colorization and manga screening. But handcrafted methods usually suffer from instability due to the noisy and ambiguous input which is common in hand drawing. To raise the reliability of the method, we designed various deep learning models in solving multiple computational manga problems. In particular, I will discuss a case study on how deep learning can be applied for manga localization. While black-and-white manga is popular among Japan and Asian region, color manga is more common for western countries. However, the conversion between color and B/W manga/comic is never trivial, and hence such localization is done by hand currently in the industry. I will present multiple deep-learning methods to tackle this challenging goal.
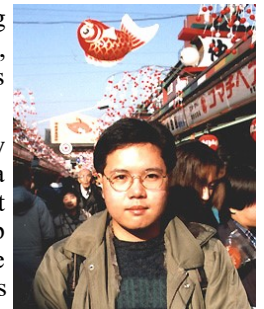
As an example, the first step to convert B/W manga to color comic is to extract the structural lines from pattern-rich manga. Unfortunately, it is very challenging to distinguish structural lines from arbitrary, highly-structured, and black-and-white screen patterns. We developed a novel learning-based approach to identify structural lines out of pattern-rich manga, without any assumption on the patterns. A deep convolutional neural network model is designed to handle the large variety of screen patterns and raise the output accuracy. Instead of preparing training data by manual tracing, we synthesize a rich set of training data pairs. The system outputs clear and smooth structural lines even if these lines are contaminated by and immersed in complex patterns and substantially outperforms state-of-the-art methods in terms of visual quality. This research is an interesting demonstration on the effectiveness of learning-based method for solving hard problems in computational manga. More applications of deep learning will be presented in this talk. We believe that more long-time open problems in computational manga will be solved in a substantial degree in the coming years.

Speaker: Tien-Tsin Wong is known with his pioneer works in Computational Manga, Image-based Relighting, Ambient Occlusion (Dust Accumulation Simulation), Sphere Maps, and GPGPU for Evolutionary Computing. He graduated from the Chinese University of Hong Kong in 1992 with a B.Sc. degree in Computer Science. He obtained his M.Phil. and Ph.D. degrees in Computer Science from the same university in 1994 and 1998 respectively. He was with HKUST in 1998. In August 1999, he joined the Computer Science & Engineering Department of the Chinese University of Hong Kong. He is currently a Professor. He is also the director of Digital Visual Entertainment Laboratory at CUHK Shenzhen Research Institute (CUSZRI). He is an ACM Senior Member and a HKIE Fellow. He received the IEEE Transactions on Multimedia Prize Paper Award 2005 and the Young Researcher Award 2004. He was the Academic Committee of Microsoft Digital Cartoon and Animation Laboratory in Beijing Film Academy, visiting professor in both South China University of China and School of Computer Science and Technology at Tianjin University. He has actively involved (as Program Committee) in several international prestigious conferences, including SIGGRAPH Asia (2009, 2010, 2012, 2013, 2018, 2019) and SIGGRAPH (2019, 2020), Eurographics (2007-2009, 2011, 2019), Pacific Graphics (2000-2005, 2007-2020), ACM I3D (2010-2013), ICCV 2009, and IEEE Virtual Reality 2011. His main research interests include computer graphics, computer vision, computational manga, machine learning for graphics, computational perception, precomputed lighting, image-based rendering, GPU techniques, medical visualization, and multimedia compression. More information about him can be found at http://www.cse.cuhk.edu.hk/~ttwong/
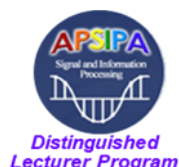
*IEEE HK Section
Lecture Series on
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2-Day IEEE Workshop on Deep Learning

Deep Learning for Speaker Recognition

Saturday, 20 March 2021, 10:30am-12:00nn

Prof. Man-Wai Mak, *PhD, SrMIEEE*

Abstract: Deep learning has played a crucial role in biometric applications such as speaker recognition and face recognition, where model parameters are learned from data. In speaker recognition, researchers and engineers have been attempting to tackle the most difficult challenges: noise robustness and domain mismatch. These efforts have now been fruitful, leading to commercial products starting to emerge, e.g., voice authentication in e-banking and speaker diarization in smart speakers. This talk provides audiences with the fundamental knowledge in deep learning, how deep learning plays an important role in extracting speaker features, and how to make the features robust to channel mismatch and acoustic noise under real application scenarios. The talk will also cover some Python implementation and evaluation platforms for beginners to join this exciting field. Most of the materials are based on the speaker's recent work and his recent book "Machine Learning for Speaker Recognition," published by Cambridge University Press in 2020.
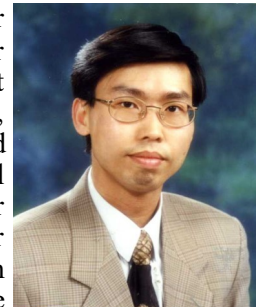
Speaker: Man-Wai MAK is currently a Professor in the Department of Electronic and Information Engineering, the Hong Kong Polytechnic University. He has authored more than 200 technical articles and three books in speaker recognition, machine learning, and bioinformatics. Dr. Mak coauthored postgraduate textbooks Biometric Authentication: A Machine Learning Approach, Prentice-Hall, 2005, and Machine Learning for Speaker Recognition, Cambridge University Press, 2020. He served as a member of the IEEE Machine Learning for Signal Processing Technical Committee in 2005--2007. He has served as an associate editor of IEEE/ACM Transactions on Audio, Speech and Language Processing. He is currently an associate editor of Journal of Signal Processing Systems and IEEE Biometrics Compendium. He also served as Technical Committee Members of ICASSP, Area Chair of Interspeech, and Technical Co-chair of ISCSLP'18 and ISCSLP'21. Dr. Mak's recent research interests include speaker recognition, speaker diarization, emotion recognition, and ECG classification.

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Signal & Information Processing — Science for Signals, Data, and Intelligence

Important Dates

April 1, 2021	May 1, 2021	July 1, 2021	July 1, 2021	August 31, 2021	October 1, 2021	October 1, 2021	December 14 – 17, 2021
Submission of Proposals for Special Sessions	Submission of Proposals for Forum, Panel & Tutorial Sessions	Submission of Regular Papers	Submission of Special Session Papers	Notification of Papers Acceptance	Submission of Camera-Ready Papers	Author (Early-Bird) Registration Deadline	Tutorials, Summit and Conference Dates

APSIPA ASC 2021 (www.apsipa2021.org) is the 13th annual conference organized by Asia-Pacific Signal and Information Processing Association (APSIPA), which will be held on December 14 – 17, 2021, Tokyo, Japan. Founded in 2009, APSIPA organization (www.apsipa.org) aims to promote research and education in signal processing, information technology, and communications. The annual conferences have been held previously in Auckland, New Zealand (2020), Lanzhou, China (2019), Hawaii, USA (2018), Kuala Lumpur, Malaysia (2017), Jeju, Korea (2016), Hong Kong SAR (2015), Siem Reap, Cambodia (2014), Kaohsiung, Taiwan (2013), Los Angeles, USA (2012), Xi'an, China (2011), Singapore (2010), and Sapporo, Japan (2009). APSIPA is interested in all aspects of signal and information processing theories, algorithms, securities, implementations, and applications. Please refer to the conference web page for full information. All accepted papers are expected to be included in IEEE Xplore and indexed by EI, like all previous years. The technical program includes, but not limited to, the following areas

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- Speech, Language, and Audio
- Biomedical Signal Processing and Systems
- Image, Video, and Multimedia
- Multimedia Security and Forensics
- Wireless Communications and Networking
- Deep Learning: Algorithms, Implementations, and applications
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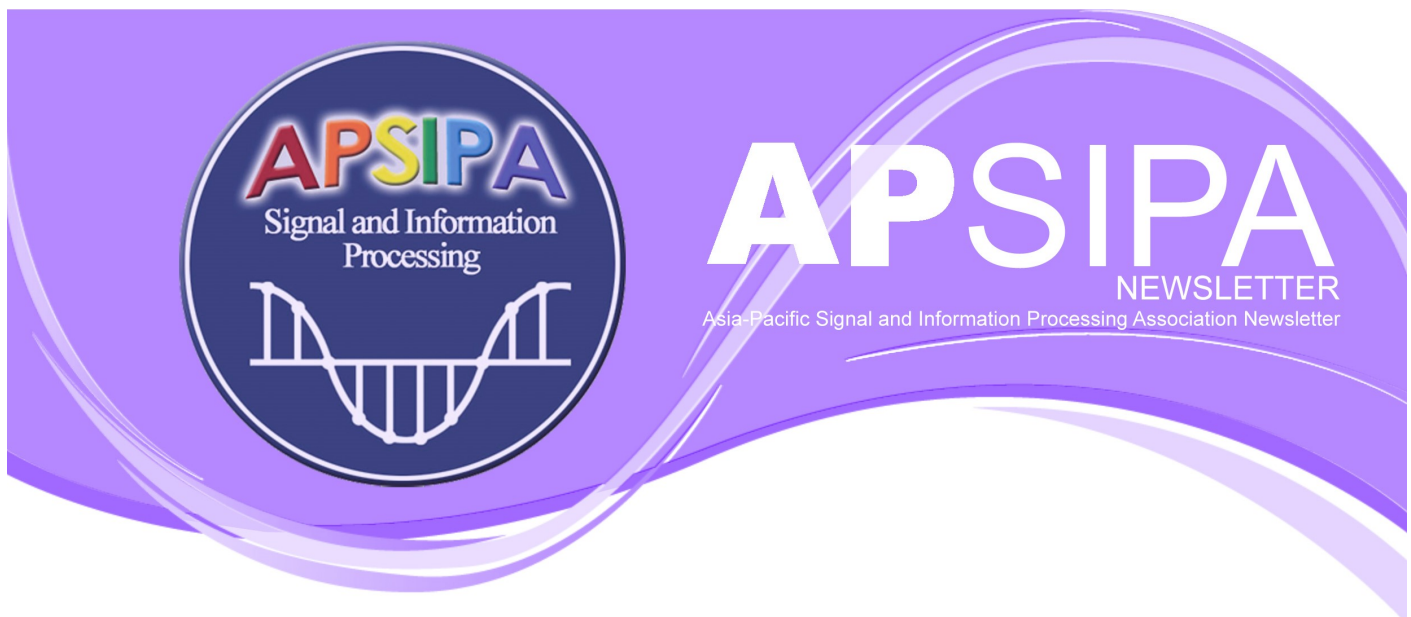Manager: Kin-Man Lam, Kenneth,
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