

第十五届“数字电视与多媒体通信”国际论坛

THE 15TH INTERNATIONAL FORUM OF DIGITAL TV AND MULTIMEDIA COMMUNICATION

主办单位:

中国国际工业博览会组委会

指导单位:

上海市科学技术协会

承办单位:

上海市图像图形学学会

协办单位:

上海交通大学

上海市信息家电行业协会

中国电子学会青年科学家俱乐部多媒体

技术与虚拟现实专委会

上海先进通信与数据科学研究院

上海熠知(ThinkForce)电子科技有限公司

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议程安排 Schedule

2018/9/20 9:00~9:15 会议开始 Beginning

2018/9/20 9:15~12:00 主题报告 Keynote Speech

2018/9/20 13:15~15:30 主题报告 Keynote Speech

2018/9/20 15:50~17:30 论文口头报告

2018/9/21 9:00~10:45 论文报告 Spotlight

2018/9/21 10:45~11:45 评选最佳海报

主题报告 Keynote Speech



田永鸿 北京大学信息科学技术学院教授

《Joint Representation and Processing of Signals and Features for Visual Big Data》
9/20 9:15-10:00

Abstract: In the current systems, video streams are captured and compressed at the cameras, and then transmitted to the backend servers or cloud for big data analysis and retrieval. Nevertheless, it is impractical to aggregate all compressed video streams from hundreds of thousands of cameras into a cloud, even by utilizing the state-of-the-art codecs to compress these videos. Moreover, it is recognized that compression will inevitably affect visual feature extraction, consequently degrading the subsequent analysis and retrieval performance. The rationale behind is that video coding and analysis are traditionally targeted to different objectives, where video coding is basically a signal processing issue while video analysis is a pattern recognition issue that actually needs the extracted features rather than images and videos themselves as the inputs. Thus, to address this challenge, new video processing frameworks with joint representation and processing of signals and features is highly desirable. In this talk, I will share our thoughts and some recent works along this technological trend, including analysis-friendly scene video coding, DL-based coding and compact feature representation, and spiking coding and analysis.

Yonghong Tian is currently a Full Professor with the School of Electronics Engineering and Computer Science, Peking University, China. His research interests include computer vision, multimedia big data, and brain-inspired computation. He is the author or coauthor of over 160 technical articles in refereed journals and conferences. Prof. Tian was/is an Associate Editor of IEEE Transactions on Circuits and Systems for Video Technology (2018.1-), IEEE Transactions on Multimedia (2014.8-2018.8), IEEE Multimedia Magazine (2018.1-), and IEEE Access (2017.1-). He co-initiated IEEE International Conference on Multimedia Big Data (BigMM) and served as the TPC Co-chair of BigMM 2015, and also served as the Technical Program Co-chair of IEEE ICME 2015, IEEE ISM 2015 and IEEE MIPR 2018/2019, the organizing committee member of ACM Multimedia 2009, IEEE MMSP 2011, IEEE ISCAS 2013, IEEE ISM 2015/2016. He was the recipient of two National Science and Technology Awards and three ministerial-level awards in China, and obtained the 2015 EURASIP Best Paper Award for the EURASIP Journal on Image and Video Processing. He is a senior member of IEEE, CIE and CCF, a member of ACM.



Sanghoon Lee 韩国延世大学教授

《数据驱动的体验质量测量》
9/20 10:00-10:45

Abstract: Abstract: With the development of immersive display technology such as ultra-high-definition (UHD) and virtual reality (VR), it is becoming possible to represent the details of contents more naturally by providing a more realistic viewing environment. In parallel, quality of experience (QoE) has been discussed from both academy and industry to grade consumer products from the users' quality perspective. In this keynote, we will discuss several important current data driven based QoE measurements such as deep-learning based quality assessment (QA) and VR discomfort assessment. First, we consider the deep convolutional neural network (CNN) based QA tasks which analyze the human perception more accurately. Recently, the CNN has emerged as a core technology while breaking most performance records in the area of artificial intelligence via intensive training in accordance with the massive dataset. The main motivation of this speech lies in finding new insight into human perception analysis for QoE evaluation through visualization of intermediate node values. Second, we will discuss a challenging QoE issue, VR discomfort assessment which is one of the most serious problems in current display market. Being able to predict the degree of sickness that a user experiences is an important goal in ensuring viewing safety. Ideally, such predictive models should be explained in terms of the human factor perceived by the human visual system (HVS). At the same time, it is important to build a database to demonstrate the precise performance of the model. To deal with, we will watch several VR demo sequences and discuss a visual clue of how the human perceives visual discomfort in terms of HVS.

Sanghoon Lee (M'05-SM'12) received the B.S. in E.E. from Yonsei University in 1989 and the M.S. in E.E. from KAIST in 1991. From 1991 to 1996, he worked for Korea Telecom. He received his Ph.D. in E.E. from the University of Texas at Austin in 2000. From 1999 to 2002, he worked for Lucent Technologies. In March 2003, he joined the faculty of the Department of Electrical and Electronics Engineering, Yonsei University, Seoul, Korea, where he is a Full Professor. He was an Associate Editor of the IEEE Trans. Image Processing (2013) and Journal of Electronic Imaging (2015). He currently serves as a Chair of the APSIPA IVM Technical Committee (2018-), and a Member in the Technical Committees of the IEEE MMSP (2016-) and IVMS (2014-). He has participated in the international activities as a General Chair of the 2013 IEEE IVMS Workshop, a Technical Program Co-chair of the IEEE International Conference on Multimedia and Expo (ICME) 2018, the Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA) 2018, and the Exhibition Chair of IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2018, the Local Arrangements Chair of IEEE International Symposium On Broadband Multimedia Systems and Broadcasting (BMSB), 2012. He received a 2015 Yonsei Academic Award and 2010, 2015, 2016, 2017 Yonsei Outstanding Accomplishment Awards, a 2012 Special Service Award from the IEEE Broadcast Technology Society, a 2013 Special Service Award from the IEEE Signal Processing Society, a Humantech Thesis Award of Samsung Electronics, 2013, an IEEE Seoul Section Student Paper Contest Award, 2012, and a Qualcomm Innovation Award, Qualcomm, 2012. His research interests include deep learning, image&video quality of experience, computer vision and computer graphics.



张晓平 加拿大Ryerson 大学教授

《诺贝尔经济学奖的信号处理之路——大数据的风险、相关、因果和预测分析》

9/20 11:05-11:50

Abstract: Economic data and financial markets are intriguing to researchers working on big data and quantitative models. With rapid growth and increasing access to data in digital form, finance, economics, and marketing data are poised to become one of the most important and tangible big data applications, owing not only to the relative clean organization and structure of the data but also to clear application objectives and market demands. However, data related economic and social science studies often have different viewpoints from signal processing (SP) and artificial intelligence (AI).

This talk intends to introduce some foundational concepts in finance/economics/marketing research, from signal and data processing point of view. Some of these ideas led to Nobel Prize in Economics. We explain the different focuses between economic and social science data analysis and physical signal processing, such as co-integration and causality analysis. For example, in most physical systems using signal processing and machine learning, the causality (input/output) relationship is often known and taken for granted, but it is generally not obvious/unknown in social and economic sciences. It is critical to discriminate causalities from spurious correlations in data. We illustrate a marketing dynamic response model that uses signal processing tools to identify and catch fleeting business opportunities. We also introduce the concept of predictive analytics from probabilistic point of view. We hope to inspire multimedia researchers to broaden their knowledge beyond their current areas of expertise and grasp some basics concepts and evaluation criteria in economics and social science fields.

Xiao-Ping (Steven) Zhang received B.S. and Ph.D. degrees from Tsinghua University, in 1992 and 1996, respectively, both in Electronic Engineering. He holds an MBA in Finance, Economics and Entrepreneurship with Honors from the University of Chicago Booth School of Business, Chicago, IL. Since Fall 2000, he has been with the Department of Electrical and Computer Engineering, Ryerson University, where he is now Professor, Director of Communication and Signal Processing Applications Laboratory (CASPAL). He has served as Program Director of Graduate Studies. He is cross-appointed to the Finance Department at the Ted Rogers School of Management at Ryerson University. He was Visiting Scientist at Research Laboratory of Electronics (RLE), Massachusetts Institute of Technology, in 2015 and 2017. His research interests include statistical signal processing and big data analytics, multimedia content analysis, sensor networks and electronic systems, machine learning/AI, and applications in bioinformatics, finance, and marketing. He is/was an Associate Editor for IEEE Transactions on Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, IEEE Transactions on Circuits and Systems for Video Technology, and IEEE Signal Processing Letters.



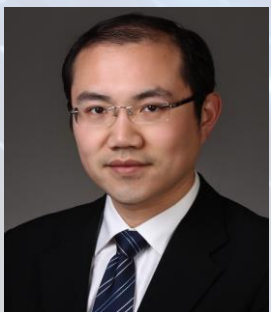
刘青山 南京信息工程大学信息与控制学院教授

《图像特征学习》

9/20 13:15-14:00

摘要: 机器视觉的目标就是让机器能像人一样自动“看懂”外部环境，因此是人工智能领域的一个重要研究方向。图像特征学习是机器视觉研究的核心问题，其目的是视觉信息进行加工分析，以便于进一步实现视觉理解。在汇报中，我将重点从高维视觉特征表达和深度视觉特征学习两个方面，介绍我们团队近年来在图像特征学习方面的一些工作，以及在人脸图像分析、遥感图像分析等应用研究。

刘青山博士现任南京信息工程大学教授，博士生导师，江苏省大数据分析技术重点实验室主任，IEEE高级会员。2000年4月毕业于中科院自动化所模式识别国家重点实验室获博士学位，随后留实验室工作，2006年4月赴美国Rutger大学访问、工作。2011年9月加盟南京信息工程大学。主要研究方向为图像与视频分析、计算机视觉、和机器学习。2011年入选江苏省特聘教授，2012年入选教育部新世纪人才，同年获首届江苏省杰出青年基金资助，2013年入选江苏省双创个人，2014年入选江苏省双创团队领军人才，2016年荣获江苏省优秀教育工作者，2017年入选全国高校黄大年式教师团队。先后主持承担了国家自然科学基金项目4项，其中国家自然科学基金重点项目1项，以第一完成人获2016年度教育部自然科学二等奖和2017年江苏省教学成果二等奖。

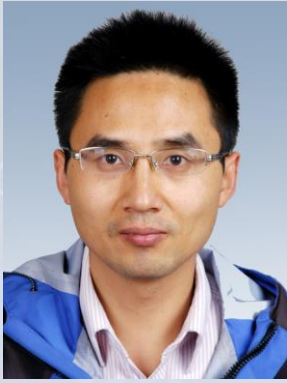


张震宁 上海熠知(ThinkForce)电子科技有限公司的市场副总裁 《人工智能芯片及其计算机视觉领域应用》

9/20 14:00-14:45

摘要: 报告首先介绍了深度神经网络运算的特性，进而说明了各类芯片对此类运算特征的支持情况，然后说明了人工智能芯片的主要设计思想和考虑因素。此类芯片在计算机视觉中的应用广泛，报告罗列了人工智能芯片在智慧城市、智能安防、智慧社区、智慧商贸、视频内容甄别和视频内容生成领域的应用情况和前景。

张震宁先生在上海交通大学获得电子信息本科及硕士学位、安泰经管学院MBA学院，并在麻省理工学院斯隆管院获得管理硕士学位。他先后任职于外资及国资的业界知名数字电视芯片公司负责产品规划研发及市场拓展，于腾讯视频担任客厅产品中心总监负责其OTT视频业务的产品开发与推广。目前，张震宁担任上海熠知(ThinkForce)电子科技有限公司的市场副总裁。ThinkForce是中国人工智能芯片领域的新锐企业，专注于通过ASIC芯片提供高效的AI算力及贴近市场需求的智能产品解决方案，已经获得依图科技、云锋基金、红杉资本和高瓴资本的共同投资。



沈礼权, 上海大学, 研究员
《自由视点电视和沉浸式视频的进展以及相关研究工作》

9/20 14:45-15:30

摘要: 沉浸式视频是近年来迅速发展起来的视觉新技术, 使用户感觉到沉浸在环境中, 增强对内容的欣赏性。随着沉浸式视频设备、5G网络和终端技术的成熟, 沉浸视频正越来越多地用于影视、游戏、医疗、教育等应用中。据思科的统计报告显示: 在2016年的应用沉浸视频平均月流量达到13.3 PB, 预计到2021年将上升到140 PB, 年增长率达到60%。国际标准化组织MPEG意识到新一代沉浸式视觉媒体系统, 启动MPEG-I计划, 旨在逐步实现沉浸式视觉媒体的规范化, 已发布360度全景格式视频的标准化, 并进一步扩展到3自由度和6自由度沉浸式视频, 预计在2019年启动沉浸式视频的标准化。沉浸式视觉媒体的特点包括: 可旋转性、运动、旋转与运动结合、低延迟、双目视觉、高分辨率以及交互性等。在本次报告中, 讨论沉浸式视频采集、压缩和显示各环节的关键技术和介绍相关的研究工作。

沈礼权, 上海大学, 研究员。在相继获得上海市青年启明星计划和浦江计划等人才项目, 于2014年获得国家自然科学基金委优秀青年科学基金, 2016年获得教育部自然科学二等奖(排名第1), 曾在2012年获得上海市科技进步二等奖。在国际和国内学术期刊和会议上发表论文100余篇, 累计SCI他引1500余次, SCOPUS他引1400余次, Google Scholar他引2400余次, H-index为25, 单篇最高引用超过345次。第一作者发表的IEEE Trans.论文有4篇入选ESI高被引论文、1篇入选ESI热点论文。编著《二维和三维视频处理及立体显示技术》(2010年, 科学出版社)和《深度增强的3D视频处理技术》(2015年, 人民邮电出版社)两本著作。申请发明专利12项, 其中已授权的发明专利6项。提交国际、国内标准化提案10余项。研究方向包括: 新型视频压缩与处理、面向机器的视频智能处理以及图像质量/体验质量评价等。

9/20 15:50-17:30

- Wei Zhong: Design of 2D Checkboard Nonuniform Directional Filter Banks and Its Application to Image Nonlinear Approximation
- Sai Ma: Modulation Spectral Features for Intrusive Measurement of Reverberant Speech Quality
- Yaowen Zhu: Design of Online Annotation and Incision System for IVUS Images
- Li Dong: Locally Adaptive Noise Covariance Estimation for Color Images
- Jing Hu: Application of Random Forest Classifier to Visual Diagnosis of Rapeseed Nutrient Deficiency
- Kangli Zeng: Nonlinear Contextual Face Hallucination

*评选2篇最佳论文奖

9/20 18:00-20:00 banquet

9/21 9:00-10:45 Spotlight 每篇论文3分钟 (3-5页PPT) 进行介绍, 介绍背景、工作、取得的成果

- Xiaofei Peng: Teaching Assistant and Class Attendance Analysis using Surveillance Camera
- Tianqi Shi: Dynamic Attribute Package: Crowd Behavior Recognition in Complex Scene
- Jialing Xu: A novel R-λ rate control algorithm for HEVC
- Bo Zang: What is the 3D Comfort Difference Experienced via VR Glasses and 3D-TV
- Xin Fang: Channel Estimation over Doubly Selective Channels Based on Basis Expansion Model and Compressive Sensing
- Jingxing Xu: Mixed Tiling Scheme for Adaptive VR Streaming
- Ming He: Deep Neural Network Acceleration Method Based on Sparsity
- Linlin Zhu: An Image Enhancement Based CDVS Matching Algorithm
- Pei Wu: Quality Assessment of Virtual Reality Videos
- Honghe Zheng: Feature-Selecting based Hashing via Deep Convolutional Neural Networks
- Guoping Wang: Efficient and Robust Homography Estimation using Compressed Convolutional Neural Network
- Nicolas Chung: Improving Semantic Style Transfer Using Guided Gram Matrices
- Rui Sun: An Object Detection-based Seam Line Algorithm for Image Stitching
- Peng Ye: Enhanced Saliency Prediction Via Free Energy Principle
- Long Ye: A gigapixel image coding transmission scheme in edge computing environment
- Yuying Su: Multi-CNNs Bootstrap against Label Noise with Applications in Apparent Age Estimation
- Guoping Li: Research on a Parallel Rate Control Algorithm of macro-block layer
- Zhaoliang Ma: Motion Adaptive Intra Refresh for Low Delay HEVC Encoding
- Xudong Chen: Real-Time Semantic Mapping of Visual SLAM Based on DCNN
- Weiling Chen: Super-Resolution Restoration for Sonar Images: Comprehensive Comparison
- Qian Li: DDoS Attacks Detection using Machine Learning Algorithms
- Bicheng Wang: Performance Analysis of Full-Duplex Cooperative Systems over Correlated Fading Channels
- Hong Lu: Sequentially Cutting Based the Cluster Number Determination for Spatial Feature Classification
- Maoshen Liu: Learn a Deep Convolutional Neural Network for Image Smoke Detection
- Jun Wu: How to Reliably Upsample Screen Content Images?
- Qisong Fu: The design of immersion acrophobia adjuvant therapy system (IAATS)
- Hongxia Li: Auditing between Event Logs and Process trees
- Jiaqi Yu: SAR image change detection using several filters combined with log difference image
- Jing Hu: Simulation and Experiment on Artificial Landmark-Based Monocular Visual Navigation System for Mobile Robot
- Lu Han: An Implementation of Capture and Playback for IP-encapsulated Video in Professional Media Production
- Yicong Peng: Virtual Reality based Road Crossing Training for Autistic Children with Behavioral Analysis
- Sifeng Xia: Deep integer-position samples refinement for motion compensation of video coding
- Jiajun Ding: An Adaptive Rate Control Algorithm for HEVC-SCC with High Perceptual Quality

9/21 10:45-11:45 Poster

自由交流、提问, 评选3篇最佳Poster奖。

9/21 11:45-13:00 午饭