15th International Symposium on Visual Computing

October 5-7, 2020, Virtual (Pacific Standard Time – PST)

Contents

Registration Desk Hours: N/A

8:50 – 9:00	*Welcome* – **George Bebis**, University of Nevada, Reno		
9:00–10:00	*Keynote:* **Aaron Hertzmann,** Adobe Research, USA (Room K) Moderator: George Bebis		
	Parallel Sessions		
10:10-12:10	**Deep Learning I** (Room A) Chair: Alireza Tavakkoli		**Visualization** (Room C) Chair: Kenneth Moreland
	10:10	**Daniel Schwartz, Yigit Alparslan and Edward Kim**. Regularization and Sparsity for Adversarial Robustness and Stable Attribution	**Sudarshan Devkota and Sumanta Pattanaik**. Referenced Based Color Transfer for Medical Volume Rendering
	10:30	**Iman Saberi and Fathiyeh Faghih**. Self-Competitive Neural Networks	**Wanderley de Souza Alencar, Walid Abdala Rfaei Jradi, Hugo Alexandre Dantas Do Nascimento, Juliana Paula Félix and Fabrizzio Alphonsus Alves de Melo Nunes Soares**. An Empirical Methodological Study of Evaluation Methods Applied to Educational Timetabling Visualizations
	10:50	**Tan Lu and Ann Dooms**. A Novel Contractive GAN Model for a Unified Approach Towards Blind Quality Assessment of Images from Heterogeneous Sources	**Karen Lucknavalai and Jurgen Schulze**. Real-Time Contrast Enhancement for 3D Medical Image Stacks
11:10-11:30	*Coffee Break*		
	11:30	**Kevin Bui, Fredrick Park, Shuai Zhang, Yingyong Qi and Jack Xin**. Nonconvex Regularization for Network Slimming: Compressing CNNs Even More	**Thomas Wilde, Holger Theisel and Christian Rössl**. Flow Map Processing by Space-Time Deformation
	11:50	**Sameerah Talafha, Banafsheh Rekabdar, Christos Mousas and Chinwe Ekenna**. Biologically Inspired Sleep Algorithm for VariationalAuto-Encoders	**Chau Pham, Vung Pham and Tommy Dang**. GenExplorer: Visualizing and Comparing Gene Expression Levels via Differential Charts
10:10-12:10	**Segmentation** (Room B) Chair: Emily Hand		**N/A**
	10:10	**Bekir Sahin and Ahmet Soylu**. Optimal Ship Navigation by Image Processing	
	10:30	**Daniel Helm and Martin Kampel**. Overscan Detection in Digitized Analog Films by Precise Sprocket Hole Segmentation	
	10:50	**Iason Katsamenis, Eftychios Protopapadakis, Anastasios Doulamis, Nikolaos Doulamis and Athanasios Voulodimos**. Pixel-level Corrosion Detection on Metal Constructions by Fusion of Deep Learning Semantic and Contour Segmentation	
11:10-11:30	*Coffee Break*		
	11:30	**Renato Arantes, George Vogiatzis and Diego Faria**. CSC-GAN: Cycle and semantic consistency for dataset augmentation	
	11:50	**Marcos José Canejo and Carlos Alexandre Barros de Mello**. Improvements on the Superpixel Hierarchy Algorithm with Applications to Image Segmentation and Saliency Detection	
12:10-1:30	*Lunch* Break		

1:30-2:30		Keynote: **Victoria Interrante**, **University of Minnesota, USA** (Room K) Moderator: Alireza Tavakkoli	
		Parallel Sessions	
2:40-4:40		**Video Analysis and Event Recognition** (Room A) Chair: Mircea Nicolescu	**Applications** (Room C) Chair: Banafsheh Rekabdar
	2:40	**Jiahao Wen, Guillen Luis, Alfian Amrizal Muhammad, Toru Abe and Takuo Suganuma**. An Event-Based Hierarchical Method for Customer Activity Recognition in Retail Stores	**Carson Vogt, Geng Lyu and Kartic Subr**. Lightless Fields: Enhancement and Denoising of Light-deficient Light Fields
	3:00	**Han Peng and Abolfazl Razi**. Fully Autonomous UAV-based Action Recognition System Using Aerial Imagery	**Selameab Demilew, Hamed Aghdam, Robert Laganière and Emil Petriu**. FA3D: Fast and Accurate 3D Object Detection
	3:20	**Mahdi Davoodikakhki and Kangkang Yin**. Hierarchical Action Classification with Network Pruning	**Omar Graja, Fatma Najar and Nizar Bouguila**. Generalized Inverted Dirichlet Optimal predictor for Image inpainting
3:40-4:00		*Coffee Break*	
	4:00	**Aditya Agarwal and Bipasha Sen**. An Approach Towards Action Recognition using Part Based Hierarchical Fusion	**Nuo Cheng, Pu Li, Xiaohan Li and Shengguang Lei**. BVNet: A 3D End-to-end Model Based on Point Cloud
	4:20		**Zahra Anvari and Vassilis Athitsos**. Evaluating Single Image Dehazing Methods Under Realistic Sunlight Haze
2:40-4:40		**ST: Computational Bioimaging** (Room B) Chair: George Bebis	**N/A**
	2:40	**Josh Daniel L. Ong, Erinn Giannice T. Abigan, Luis Gabriel Cajucom, Patricia Angela R. Abu and Ma. Regina Justina E. Estuar**. Ensemble Convolutional Neural Networks for the Detection of Microscopic Fusarium Oxysporum	
	3:00	**Milad Sikaroudi, Benyamin Ghojogh, Amir Safarpoor, Fakhri Karray, Mark Crowley and Hamid Tizhoosh**. Offline versus Online Triplet Mining based on Extreme Distances of Histopathology Patches	
	3:20	**Leonardo Campos and Denis Salvadeo**. Multi-Label Classification of Panoramic Radiographic Images using a Convolutional Neural Network	
3:40-4:00		*Coffee Break*	
	4:00	**Danial Maleki, Mehdi Afshari, Morteza Babaie and H.R. Tizhoosh**. Ink Marker Segmentation in Histopathology Images Using Deep Learning	
	4:20	**Daniel Cruz, Maíla Claro, Rodrigo Veras, Luis Vogado, Helano Portela, Nayara Moura and Daniel Luz**. P-FideNet: Plasmodium Falciparum Identification Neural Network	

Tuesday, October 6th

9:00-10:00		*Keynote:* **Ahmed Elgammal**, **Rutgers University, USA** (Room K) Moderator: Mircea Nicolescu	
		Parallel Sessions	
10:10-12:10		**Biometrics** (Room A) Chair: Edward Kim	**Motion and Tracking** (Room C) Chair: Mircea Nicolescu
	10:10	**Yujian Chen and Shiguang Liu**. Deep Partial Occlusion Facial Expression Recognition via Improved	**Ahmed Zgaren, Wassim Bouachir and Riadh Ksantini**. Coarse-to-Fine Object Tracking Using Deep Features and Correlation filters
	10:30	**Sirine Ammar, Thierry Bouwmans, Nizar Zaghden and Mahmoud Neji**. Towards an Effective Approach for Face Recognition with DCGANs Data Augmentation	**Sherif A.S. Mohamed Mohamed, Jawad Yasin, Mohammad-Hashem Haghbayan, Antonio Miele, Jukka Heikkonen, Hannu Tenhunen and Juha Plosila**. Asynchronous Corner Tracking Algorithm based on Lifetime of Events for DAVIS Cameras
	10:50	**Hao Liang**. Controlled AutoEncoders to Generate Faces from Voices	**Arindam Biswas and Brendan Morris**. TAGCN: Topology-Aware Graph Convolutional Network for Trajectory Prediction
11:10-11:30		*Coffee Break*	
	11:30	**Georgia Chatzitzisi, Michalis Vrigkas and Christophoros Nikou**. Gender and Age Estimation without Facial Information from Still Images	**Chenxi Li and Fernand Cohen**. 3D articulated body model using anthropometric control points and an articulation video
	11:50	**Kamran Ali and Charles Hughes**. Face Reenactment Based Facial Expression Recognition	**Jen-Jui Liu, Jacob Newman and Dah-Jye Lee**. Body Motion Analysis for Golf Swing Evaluation
10:10-12:10		**Object Recognition/Detection/Categorization** (Room B) Chair: Alireza Tavakkoli	**N/A**
	10:10	**Debasmit Das, J. H. Moon and C. S. George Lee**. Few-shot Image Recognition with Manifolds	
	10:30	**Xingyi Yang, Yong Wang and Robert Laganiere**. A scale-aware YOLO model for pedestrian detection	
	10:50	**Fatma Najar and Nizar Bouguila**. Image categorization using Agglomerative clustering based smoothed Dirichlet mixtures	
11:10-11:30		*Coffee Break*	
	11:30	**Dustin Barnes, Sara Davis and Emily Hand**. SAT-CNN: A Small Neural Network for Object Recognition from Satellite Imagery	
	11:50	**Ashiq Imran and Vassilis Athitsos**. Domain Adaptive Transfer Learning on Visual Attention Aware Data Augmentation for Fine-grained Visual Categorization	
12:10-1:30		*Lunch* Break	

1:30-2:30	Keynote: **Ramin Zabih**, CornellNYC Tech & Google, USA (Room K) Moderator: Edward Kim		
	Parallel Sessions		
2:40-3:40	**3D Reconstruction** (Room A) Chair: Sotirios Diamantas		**Computer Graphics** (Room C) Chairs: Kartic Subr
	2:40	**Kuo Shiuan Peng, Gregory Dittzler and Jerzy Rozenblit**. A Light-Weight Monocular Depth Estimation With Edge-Guided Occlusion Fading Reduction	**Mirko Waldner and Torsten Bertram**. Simulation of High-Definition Pixel-Headlights
	3:00	**Simen Haugo and Annette Stahl**. Minimal Free Space Constraints for Implicit Distance Bounds	**Sina Masnadi and Joseph LaViola**. ConcurrentHull: A Fast Parallel Computing Approach to the Convex Hull Problem
	3:20	**Simen Haugo and Annette Stahl**. Iterative Closest Point with Minimal Free Space Constraints	**Manfred Lau and Luther Power**. A Data-Driven Creativity Measure for 3D Shapes
3:40-4:00	*Coffee Break*		
2:40-3:40	**Medical Image Analysis I** (Room B) Chair: Zhaozheng Yin		**N/A**
	2:40	**Andrik Rampun, Deborah Jarvis, Paul Griffiths and Paul Armitage**. Fetal Brain Segmentation using Convolutional Neural Networks with Fusion Strategies	
	3:00	**Sharif Amit Kamran, Khondker Fariha Hossain, Alireza Tavakkoli, Stewart Zuckerbrod, Salah A. Baker and Kenton M. Sanders**. Fundus2Angio: A Novel Conditional GAN Architecture for Generating Fluorescein Angiography Images from Retinal Fundus Photography	
	3:20	**Qingchao Zhang, Coy D. Heldermon and Corey Toler-Franklin**. Multiscale Detection of Cancerous Tissue in High Resolution Slide Scans	
3:40-4:00	*Coffee Break*		
4:00-6:00	**Poster Session I** (Room PL) Pre-recorded poster presentations will start at 5pm (Room PR) Session Chair: George Bebis		

Wednesday, October 7[h]

9:00-10:00	*Keynote:* **Ross Maciejewski**, **Arizona State University, USA** (Room K) Moderator: George Baciu	

	Parallel Sessions	

10:10-12:10	**Deep Learning II** (Room A) Chair: Edward Kim	**ST: Computer Vision Advances in Geo-Spatial Applications and Remote Sensing** (Room C) Chair: Ara Nefian
	10:10	**Gustavo Olague, Gerardo Ibarra-Vázquez, Mariana Chan-Ley, Cesar Puente, Carlos Soubervielle-Montalvo and Axel Martinez**. A Deep Genetic Programming based Methodology for Art Media Classification Robust to Adversarial Perturbations	**Billy Ermlick, Nick Newman, Devayani Pawar, Tyler Richardett, Christian Conroy, James Baldo, Rajesh Aggarwal and Marc Bosch**. Natural Disaster Building Damage Assessment Using a Two-Encoder U-Net
	10:30	**Renato Barros Arantes, George Vogiatzis and Diego Faria**. rcGAN: Learning a generative model for arbitrary size image generation	**Abdullah Said, Omar Shaat, Po-Hsuan Su, Philip Bogden, Robert Kraig and Marc Bosch**. Understanding Flooding Detection Using Overhead Imagery - Lessons Learned
	10:50	**Yunkui Pang, Zhiqing Pan, Ruiyang Sun and Shuchong Wang**. Sketch-Inspector: a Deep Mixture Model for High-Quality Sketch Generation of Cats	**Tinghuai Wang, Guangming Wang, Kuan Eeik Tan and Donghui Tan**. Hyperspectral Image Classification via Pyramid Graph Reasoning

11:10-11:30	*Coffee Break*	
	11:30	**Joseph Chakar, Rayan Al Sobbahi and Joe Tekli**. Depthwise Separable Convolutions and Variational Dropout within the context of YOLOv3	**Eftychios Protopapadakis, Anastasios Doulamis, Nikolaos Doulamis and Evangelos Maltezos**. Semi-Supervised Fine-Tuning for Deep Learning Models in Remote Sensing Applications
	11:50	**Kai Katsumata and Ryoga Kobayashi**. Uncertainty Estimates in Deep Generative Models using Gaussian Processes	**Ronald Tombe, Serestina Viriri and Jean Vincent Fonou Dombeu**. Scene Classification of Remote Sensing Images using convNet Features and Multi-grained Forest

10:10-12:10	**Virtual Reality** (Room B) Chair: Banafsheh Rekabdar	**N/A**
	10:10	**Michael Nelson, Angshuman Mazumdar, Saad Jamal, Yingjie Chen and Christos Mousas**. Walking in a Crowd Full of Virtual Characters: Effects of Virtual Character Appearance on Human Movement Behavior	
	10:30	**Chiu Yung Fu, Zackary P. T. Sin, Peter Ng and Alice Cheng**. Improving Chinese Reading Comprehensions of Dyslexic Children via VR Reading	
	10:50	**Gun Lee, Hye Sun Park, Seungwon Kim and Mark Billinghurst**. Improving User Experience in Augmented Reality Mirrors with 3D Displays	

11:10-11:30	*Coffee Break*	
	11:30	**Alexandors Koilias, Christos Mousas, Banafsheh Rekabdar and Christos-Nikolaos Anagnostopoulos**. Passenger Anxiety about Virtual Driver Awareness During a Trip with a Virtual Autonomous Vehicle	
	11:50	**Bryson Rudolph, Geoff Musick, Leah Wiitablake, Kelly Lazar, Stephen Moysey, Matthew Boyer, Catherine Mobley and Sabarish Babu**. Investigating the Display Fidelity of Popular Head-Mounted Display Systems on Spatial Updating and Learning in VR	

12:10-1:30	Lunch Break		

1:30-2:30	Keynote: **Kavita Bala**, Cornell University, USA (Room K) Moderator: Emily Hand		
	Parallel Sessions		
2:40-3:40	**Medical Image Analysis II** (Room A) Chair: Emily Hand		**Statistical Pattern Recognition** (Room C) Chair: Vassilis Athitsos
	2:40	**Hilal Maradit Kremers, Shi Yan, Taghi Ramazanian, Elham Sagheb Hossein Pour, Sunyang Fu, Sunghwan Sohn, David Lewallen, Hongfang Liu, Walter Kremers, Vipin Chaudhary, Michael Taunton and Ahmad Pahlavan Tafti.** DeepTKAClassifier: Brand Classification of Total Knee Arthroplasty Implants using Explainable Deep Convolutional Neural Networks	**Heyi Li, Yuewei Lin, Klaus Mueller and Wei Xu.** Interpreting Galaxy Deblender GAN from the Discriminator's Perspective
	3:00	**Ouerghi Hajer, Olfa Mourali and Ezzeddine Zagrouba.** Multi-Modal Image Fusion Based on Weight Local Features and Novel Sum-Modified-Laplacian in Non-Subsampled Shearlet Transform Domain	**Harris Partaourides, Andreas Voskou, Sotirios Chatzis and Dimitris Metaxas.** Variational Bayesian Sequence to Sequence Networks for Memory-Efficient Sign Language Translation
	3:20	**Alberto Rossi, Monica Bianchini and Franco Scarselli.** Robust Prostate Cancer Classification with Siamese Neural Networks	**Steven Reeves, Dongwook Lee, Anurag Singh and Kunal Verma.** A Gaussian Process Upsampling Model for Improvements in Optical Character Recognition

3:40-4:00	Coffee Break		

2:40-3:40	**Vision for Robotics** (Room B) Chair: Sotirios Diamantas		**N/A**
	2:40	**Andrew Palmer, Chris Peterson, Janelle Blankenburg, David Feil-Seifer and Monica Nicolescu.** Simple Camera-to-2D-LiDAR Calibration Method for General Use	
	3:00	**Tiago Cortinhal, George Tzelepis, Eren Erdal Aksoy.** SalsaNext: Fast, Uncertainty-aware Semantic Segmentation of LiDAR Point Clouds	
	3:20	**Prateek Arora and Christos Papachristos.** Mobile Manipulator Robot Visual Servoing and Guidance for Dynamic Target Grasping	

3:40-4:00	Coffee Break		

4:00-6:00	**Poster Session II** (Room PL) Pre-recorded poster presentations will start at 5pm (Room PR) Chair: George Bebis		

Thursday, October 8th

	Tutorial (Room TR) Moderator: <u>Emily Hand</u>
1:00-5:00	**Evolutionary Computer Vision** <u>Instructor:</u> Olague Gustavo, CICESE Research Center, Mexico

This tutorial will explain the theory and application of evolutionary computer vision, a new paradigm where challenging vision problems can be approached using the techniques of evolutionary computing. The objectives of the tutorial are to introduce the subject under the umbrella of goal-oriented vision, explaining the relationship between artificial evolution and mathematical optimization, and introducing the idea of symbolic learning through genetic programming for visual computing tasks. This methodology achieves excellent results for defining fitness functions and representations for problems by merging evolutionary computation with mathematical optimization to produce automatic creation of emerging visual behaviors. In the first part of the tutorial, we will survey the literature in a concise form, define the relevant terminology, and offer historical and philosophical motivations for the key research problems in the field. For researchers from the computer vision community, we will offer a simple introduction to the evolutionary computing paradigm. The second part of the tutorial will focus on implementing evolutionary algorithms that solve given problems using working programs in the major fields of low-, intermediate- and high-level computer vision. This tutorial will be of value to researchers, engineers, and students in the fields of computer vision, evolutionary computing, robotics, biologically inspired visual computing, machine learning, and artificial intelligence.

Gustavo Olague received the B.S. and M.S. degrees in industrial and electronics engineering from the Instituto Tecnológico de Chihuahua (ITCH), in 1992 and 1995, respectively, and the Ph.D. degree in computer vision, graphics, and robotics from the Institut Polytechnique de Grenoble (INPG) and the Institut National de Recherche en Informatique et Automatique (INRIA) in France. He is currently a Professor with the Department of Computer Science, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), México, and also the Director of the EvoVisión Research Team. He is also an Adjunct Professor of engineering with the Universidad Autonóma de Chihuahua (UACH). He has authored over 100 conference proceedings papers and journal articles, co-edited special issues in Pattern Recognition Letters, Evolutionary Computation (MIT Press), and Applied Optics (OSA). He has authored the book Evolutionary Computer Vision (Springer) in the Natural Computing Series. His main research interests are evolutionary computing and computer vision. He is a member of the Editorial Team of the IEEE Access, Neural Computing and Applications (Springer), and served as the Co-Chair of the Real-World Applications track at the main international evolutionary computing conference, GECCO (ACM SIGEVO Genetic and Evolutionary Computation Conference), in 2012 and 2013. He has received numerous distinctions, among them the Talbert Abrams Award–first honorable mention 2003– presented by the American Society for Photogrammetry and Remote Sensing (ASPRS) for authorship and recording of current and historical engineering and scientific developments in photogrammetry; Best Paper Awards at major conferences such as GECCO, EvoIASP (European Workshop on Evolutionary Computation in Image Analysis, Signal Processing, and Pattern Recognition), and EvoHOT (European Workshop on Evolutionary Hardware Optimization); and twice the Bronze Medal at the Humies (GECCO award for Human-Competitive results produced by genetic and evolutionary computation).

Poster Session I
Tuesday, October 6th (4:00pm-6:00pm)
Pre-recorded poster presentations will start at 5pm

Nikul Pandya, Philipp Werner and Ayoub Al-Hamadi. Deep Facial Expression Recognition with Occlusion Regularization
Mohammad Hamed Mozaffari Maaref and Won-Sook Lee. SEMANTIC SEGMENTATION WITH PERIPHERAL VISION
Nao Takano and Gita Alaghband. Generator From Edges: Reconstruction of Facial Images
Sascha Xu, Jan Bauer, Benjamin Axmann and Wolfgang Maass. CD2 : Combined Distances of Contrast Distributions for Image Quality Analysis
Tanmay Verlekar and Alexandre Bernardino. Video based fire detection using Xception and ConvLSTM (pre-recorded)
Sung Chun Lee, Gang Qian and Allison Beach. Real-Time Person Tracking and Association on Doorbell Cameras
Paul Stanik III, Brendan Tran Morris, Reimund Serafica and Kelly Harmon Webber. MySnapFoodLog: Culturally Sensitive Food Photo-Logging App for Dietary Biculturalism Studies
Frans Timbane, Shengzhi Du and Ronny Aylward. Hand Gesture Recognition Based on the Fusion of Visual and Touch Sensing Data
Tejas Chheda, Rithvika Iyer, Soumya Koppaka and Dhananjay Kalbande. Gastrointestinal Tract Anomaly Detection from Endoscopic Videos using Object Detection Approach
Bogdan Mocanu, Ruxandra Tapu and Titus Zaharia. A multimodal high level video segmentation for content targeted online advertising
Julkar Nine, Shadi Saleh, Shanmugapriyan Manoharan, Manoj Sapkota and Wolfram Hardt. Highway Traffic Classification for the Perception Level of Situation Awareness (pre-recorded)
Mehdi Mousavi, Aashis Khanal and Rolando Estrada. AI Playground: Unreal Engine-based Data Ablation Tool for Deep Learning
Sara Davis and Emily Hand. Homework Helper: Providing Valuable Feedback on Math Mistakes
Huyen N. Nguyen, Vinh T. Nguyen and Tommy Dang. Interface Design for HCI Classroom: From learners' perspective
Mustapha Oloko-Oba and Serestina Viriri. Pre-trained Convolutional Neural Network for the Diagnosis of Tuberculosis
Prabhakar Vemavarapu, Mehmet Tozal and Christoph Borst. Near-Optimal Concentric Circles Layout
Olufisayo Ekundayo and Serestina Viriri. Facial Expression Recognition and Ordinal Intensity Estimation: A Multilabel Learning Approach
Jad Haddad, Olivier Lezoray and Philippe Hamel. 3D-CNN for Facial Emotion Recognition in Videos (pre-recorded)
Alexander Lyons and Alberto Rossi. Prostate MRI Registration Using Siamese Metric Learning
Mana Masuda, Ryo Hachiuma, Ryo Fujii and Hideo Saito. Unsupervised Anomaly Detection of the First Person in Gait from an Egocentric Camera
Harisu Abdullahi Shehu, Will Browne and Hedwig Eisenbarth. Emotion Categorization from Video-frame Images using a Novel Sequential Voting Technique

Poster Session II

Wednesday, October 7th (4:00pm-6:00pm)
Pre-recorded poster presentations will start at 5pm

Peter Roch, Bijan Shahbaz Nejad, Marcus Handte and Pedro José Marrón. Systematic Optimization of Image Processing Pipelines Using GPUs
Izat Khamiyev, Magzhan Gabidolla, Alisher Iskakov and Fatih Demirci. Reducing Triangle Inequality Violations with Deep Learning and Its Application to Image Retrieval (pre-recorded)
Bijan Shahbaz Nejad, Peter Roch, Marcus Handte and Pedro José Marrón. A Driver Guidance System to support the Stationary Wireless Charging of Electric Vehicles (pre-recorded)
Achref Ouni, Eric Royer, Marc Chevaldonne and Michel Dhome. A Hybrid Approach for Improved Image Similarity Using Semantic Segmentation
Hang Huang, Peng Zhi, Haoran Zhou, Yujin Zhang, Qiang Wu, Binbin Yong, Weijun Tan and Qingguo Zhou. An Efficient Tiny Feature Maps based Network for Real-Time Semantic Segmentation (pre-recorded)
Qunfang Tang, Jie Yang, Haibo Liu and Zhiqiang Guo. A Modified Syn2Real Network for Nighttime Rainy Image Restoration (pre-recorded)
Harsh Sharma, Sara Soltaninejad and Irene Cheng. Automated classification of Parkinson's Disease using Diffusion Tensor Imaging Data
George Galanakis, Xenophon Zabulis and Antonis Argyros. Unsupervised domain adaptation for person re-identification with few and unlabeled target data (pre-recorded)
Ying Wen and Luminita Vese. Nonlocal Adaptive Biharmonic Regularizer for Image Restoration
Om Pandey, Ishan Gupta and Bhabani Shankar Prasad Mishra. A Robust Approach to Plagiarism Detection in Handwritten Documents
Sboniso Mgaga. Optical Coherence Tomography Latent Fingerprint Image Denoising
Camila Kolling, Victor Araujo, Rodrigo C. Barros and Soraia Raupp Musse. How Does Computer Animation Affect Our Perception Of Emotions in Video Summarization? (pre-recorded)
Arsal Syed and Brendan Tran Morris. CNN, Segmentation or Semantic Embeddings: Evaluating Scene Context for Trajectory Prediction
Rushikesh Battulwar, Ebrahim Emami, Masoud Zare Naghadehi and Javad Sattarvand. Automatic Extraction of Joint Orientations in Rock Mass using PointNet and DBSCAN
Vinit Veerendraveer Singh and Chandra Kambhamettu. Feature Map Retargeting to Classify Biomedical Journal Figures
Cristiane Ferreira, Naiane Sousa, William Ferreira, Thyago Peres Carvalho, Wanderlay Alencar, Helio Pedrini and Fabrizzio Soares. Where's Wally: A Gigapixel Image Study for Face Recognition in Crowds (pre-recorded)
Sotirios Diamantas and Kostas Alexis. Optical Flow Based Background Subtraction with a Moving Camera: Application to Autonomous Driving (pre-recorded)
Xueqing Wang, Ya-Li Hou, Xiaoli Hao and Yan Shen. Automatic 3D Object Detection from RGB-D data using PU-GAN
Kolawole Olulana, Pius Owolawi, Chunling Tu and Bolanle Abe. Nodule Generation of Lung CT Images using a 3D Convolutional LSTM Network
Osama Hassan, Serhat Sahin, Vahid Mohammadzadeh, Xiaohe Yang, Navid Amini, Apoorva Mylavarapu, Golnoush Mahmoudi, Kouros Nouri-Mahdavi and Fabien Scalzo. Deep Learning Prediction of Glaucoma Progression with Macular Optical Coherence Tomography

KEYNOTE TALK

Monday, October 5, 2020 at 9:00am

Can Computers Create Art?

Aaron Hertzmann
Adobe Research
USA

Abstract: In this talk, I will discuss whether computers, using Artificial Intelligence (AI), could create art. I cover the history of automation in art, examining the hype and reality of AI tools for art together with predictions about how they will be used. I will also discuss different scenarios for how an algorithm could be considered the author of an artwork, which, I argue, comes down to questions of why we create and appreciate artwork.

Speaker Bio-Sketch: Aaron Hertzmann is a Principal Scientist at Adobe, Inc., and an Affiliate Professor at University of Washington. He received a BA in Computer Science and Art & Art History from Rice University in 1996, and a PhD in Computer Science from New York University in 2001. He was a professor at the University of Toronto for 10 years, and has worked at Pixar Animation Studios and Microsoft Research. He has published over 100 papers in computer graphics, computer vision, machine learning, robotics, human-computer interaction, perception, and art. He is an ACM Fellow and an IEEE Fellow.

KEYNOTE TALK

Monday, October 5, 2020 at 1:30pm

Spatial Perception and Presence in Virtual Architectural Environments

Victoria Interrante
University of Minnesota
USA

Abstract: Immersive Virtual Reality (VR) technology has tremendous potential applications in architecture and design. In this talk I will review some of the work being done in my lab to enhance the utility of VR for architecture and design applications, focusing primarily on the investigation of factors influencing spatial perception accuracy in immersive architectural environments, but also including the use of VR technology to investigate questions of interest to architectural and interior designers such as how wallpaper patterns and window features affect people's subjective experience in architectural interiors.

Speaker Bio-Sketch: Victoria Interrante is a Full Professor in the Department of Computer Science and Engineering at the University of Minnesota and a recipient of the 2020 IEEE VGTC Virtual Reality Career Award for her lifelong contributions to the fields of virtual reality and visualization. Her current research interests encompass all aspects of the design, implementation, and evaluation of virtual reality applications for social good. In addition to her long-standing efforts related to spatial perception and presence, other recent projects have focused on: cybersickness mitigation, developing VR applications to understand and address implicit and explicit bias, and the development and use of VR technology in support of psychiatric, cardiac, dosimetric and other medical applications.

KEYNOTE TALK

Tuesday, October 6, 2020 at 9:00am

The Shape of Art History in the Eyes of the Machine

Ahmed Elgammal
Rutgers University
USA

Abstract: In this talk, I will present results of research activities at the Art and Artificial Intelligence Laboratory at Rutgers University. We investigate perceptual and cognitive tasks related to human creativity in visual art. In particular, we study problems related to art styles, influence, and the quantification of creativity. We develop computational models that aim at providing answers to questions about what characterizes the sequence and evolution of changes in style over time. The talk will cover advances in automated prediction of style, how that relates to art history methodology, and what that tells us about how the machine sees art history. The talk will also delve into our recent research on quantifying creativity in art in regards to its novelty and influence, as well as computational models that simulate the art-producing system.

Speaker Bio-Sketch: Dr. Ahmed Elgammal is a professor at the Department of Computer Science, Rutgers University. He is the founder and director of the Art and Artificial Intelligence Laboratory at Rutgers, which focuses on data science in the domain of digital humanities. He is also an Executive Council Faculty at Rutgers University Center for Cognitive Science. Prof. Elgammal has published over 180 peer-reviewed papers, book chapters, and books in the fields of computer vision, machine learning and digital humanities. He is a senior member of the Institute of Electrical and Electronics Engineers (IEEE). He received several National Science Foundation research grants, including the CAREER Award in 2006. Dr. Elgammal research on knowledge discovery in art history received worldwide media attention, including many reports on the Washington Post, New York Times, Boston Globe, NBC News, the Daily Telegraph, Science News, and others. In 2016 a TV short documentary produced for PBS about his research received an Emmy Award. Dr. Elgammal received his M.Sc. and Ph.D. degrees in computer science from the University of Maryland, College Park, in 2000 and 2002, respectively.

KEYNOTE TALK

Tuesday, October 6, 2020 at 1:30pm

Object-oriented image stitching

Ramin Zabih
Cornell University's New York City & Google
USA

Abstract: Image stitching is one of the most widely used applications of computer vision, appearing in well-known applications like Google Street view and panorama mode in commercial cell phones. However, despite the prevalence of artifacts and errors, there has been little to no progress in stitching research over the last ten years. There is no generally accepted evaluation metric and relatively few attempts to directly deal with large view point changes or object movement. We describe a reframing of stitching that exploits the importance of objects, and the algorithmic and evaluation techniques that naturally result. We will also present a technique that directly addresses the most visually disruptive stitching errors and can act as an alarm bell for these errors in stitching results. These ideas can be naturally extended to the panorama algorithms widely used in smartphones. Joint work with Charles Herrmann, Chen Wang, Richard Bowen and Emil Keyder, from Cornell Tech and Google Research.

Speaker Bio-Sketch: Ramin Zabih is a professor of Computer Science at Cornell University's New York City campus, and a research scientist at Google. He is best known for his work on discrete optimization, which received test-of-time awards at ECCV12 and ICCV13. He is also the founder and president of the Computer Vision Foundation (CVF), a non-profit that co-sponsors CVPR, ICCV and WACV, and was responsible for providing open access to these conferences. He served as Editor-in-Chief of IEEE TPAMI, as program chair for CVPR07 and general chair for CVPR13, ECCV18, CVPR20 and CVPR24. He is a fellow of the ACM and IEEE.

KEYNOTE TALK

Wednesday, October 7, 2020 at 9:00am

Fun with Visualization in the Data Deluge

Ross Maciejewski
Arizona State University
USA

Abstract: From smart phones to fitness trackers to sensor enabled buildings, data is currently being collected at an unprecedented rate. Now, more than ever, data exists that can be used to gain insight into questions that run the gamut from nonsensical to essential. One key technology for gaining insight into data is visualization. In this talk, we will explore how visualization can be leveraged to help us entertain fun and unique questions in the data deluge. We will investigate how social media can help us predict the next blockbuster film, how much information does your name carry, how Google Street View can open a world of questions for urban planners, and more. By thinking about fun questions for datasets, we will demonstrate how visual computing can help build cross-domain collaborations, paving the way to discover new insights and challenges.

Speaker Bio-Sketch: Ross Maciejewski is an Associate Professor at Arizona State University in the School of Computing, Informatics & Decision Systems Engineering and Director of the Center for Accelerating Operational Efficiency (CAOE) – a Department of Homeland Security Center of Excellence. His primary research interests are in the areas of geographical visualization and visual analytics. Professor Maciejewski is a recipient of an NSF CAREER Award (2014) and was named a Fulton Faculty Exemplar (2017) and Global Security Fellow at Arizona State. His work has been recognized through a variety of awards at the IEEE Visual Analytics Contest (2010, 2013, 2015), a best paper award in EuroVis 2017, and a CHI Honorable Mention Award in 2018. He was Co-Chair of IEEE VIS in 2017 and Papers Co-Chair for the 2019 and 2020 IEEE Visual Analytics Science and Technology (VAST) Conference. He currently serves as an Associate Editor for IEEE Transactions on Visualization and Computer Graphics.

KEYNOTE TALK

Wednesday, October 7, 2020 at 1:30pm

Understanding Visual Appearance from Micron to Global Scale

Kavita Bala
Cornell University
USA

Abstract: Augmented reality/mixed reality (AR/MR) technologies are poised to create compelling and immersive user experiences by combining computer vision and computer graphics. Imagine users interacting with the world around them through their AR device. Visual search tells them what they are seeing, while computer graphics augments reality by overlaying real objects with virtual objects. AR/VR can have a far-ranging impact across many applications, such as retail, virtual prototyping, and entertainment.

In this talk, I will describe my group's research on these complementary areas: graphics models for realistic visual appearance, and visual search and fine-grained recognition for scene understanding. We will also see how these technologies can go beyond AR/VR applications to enable visual discovery—using recognition as a
core building block, we can mine social media images at a global scale to discover visual patterns and trends across geography and time.

Speaker Bio-Sketch: Kavita Bala is the Dean of Computing and Information Science at Cornell University. She received her S.M. and Ph.D. from MIT, her B.Tech. from IIT (Bombay), co-founded GrokStyle (acquired by Facebook), and served as the Chair of the Computer Science department at Cornell. Bala specializes in computer vision and computer graphics, leading research in recognition and visual search; physically-based scalable rendering; material modeling and acquisition; and human perception. Bala has authored the graduate-level textbook "Advanced Global Illumination", and has served as the Editor-in-Chief of Transactions on Graphics (TOG), and as chair of SIGGRAPH Asia Papers in 2011. She is an ACM Fellow (2019), and the 2020 recipient of the ACM SIGGRAPH Computer Graphics Achievement Award.

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