

20th International Symposium on Visual Computing

November 17-19, 2025, Las Vegas, Nevada, USA



ISVC 2025

Contents

MONDAY, November 17th	3
TUESDAY, November 18th	5
WEDNESDAY, November 19th	7
Poster Session	9
Keynote Speakers	10
Steering Committee/Area Chairs	18
International Program Committee	19
Tutorials	23

Registration Desk Hours: Sunday, November 16th (5:00pm – 7:00pm)
Monday, November 17th – Wednesday, November 19th (8:00am-5:00pm)



Monday, November 17th

8:50 – 9:00	Welcome – <u>George Bebis</u> , University of Nevada, Reno		
9:00–10:00	Keynote: <u>Leonid Sigal</u> , University Of British Columbia, Canada (Wilshire A&B) Chair: <u>George Bebis</u>		
	Parallel Sessions		
10:10-12:10	Deep Learning (Wilshire A&B) Chair: <u>Jinwei Ye</u>		Computer Graphics (Sunset 3&4) Chair: <u>Guanzhou Ji</u>
	10:10	Shaif Chowdhury, Soham Biren Katlariwala and Devleena Kashyap. Effective Fine-Tuning with Eigenvector Centrality Based Pruning.	Shen Fan and Przemyslaw Musialski. Joint Neural SDF Reconstruction and Semantic Segmentation for CAD Models. (Recorded)
	10:30	Bertram Taetz and Gal Bordelius. Continual Learning for Image Captioning through Improved Image-Text Alignment.	Haotian Yin and Przemyslaw Musialski. Scheduling the Off-Diagonal Weingarten Loss of Neural SDFs for CAD Models.
	10:50	Chashi Mahiul Islam, Samuel Jacob Chacko, Mao Nishino and Xiuwen Liu. NeuroShield-ViT: Mechanistic Understandings of Representation Vulnerabilities and Engineering Robust Vision Transformers.	Greice Pinho Dal Molin, Vitor Miguel Xavier Peres and Soraia Raupp Musse. Predicting Uncanny Perception in Virtual Humans Through Image Features. (Recorded)
11:10-11:30	Coffee Break		
	11:30	Xinjin Li, Yulie Lu, Jinghan Cao, Yu Ma, Zhenglin Li and Yeyang Zhou. CATCH: A Modular Cross-domain Adaptive Template with Hook. (Recorded)	Damian Bowness and Charalambos Poullis. Extreme Views: 3DGS Filter for Novel View Synthesis from Out-of-Distribution Camera Poses.
	11:50	Koji Kamma and Toshikazu Wada. PPP: Performance Preserving Pruning for Deep Neural Networks.	Guanzhou Ji, Sriram Narayanan, Azadeh Sawyer and Srinivasa Narasimhan. Indoor Heat Estimation from a Single Visible-Light Panorama.
12:10-1:30	Lunch Break		

1:30-2:30	Keynote: Ming Lin , University of Maryland, USA (Wilshire A&B) Chair: <u>Isaac Cho</u>		
	Parallel Sessions		
2:40-4:40	Motion and Tracking (Wilshire A&B) Chair: <u>Isaac Cho</u>		Applications (Sunset 3&4) Chair: <u>Rahul Singh</u>
	2:40	Qiaoyue Yang, Sven Heutger, Christopher Niemann, Magnus Jung, Ayoub Al-Hamadi and Sven Wachsmuth. Long-Term Prediction of Local and Global Human Motion with Occlusion Recovery	Szilard Molnar, Zita Amstadt, Levente Tamas and Zoltan Kato. Object-Based Camera Pose Estimation from a Single Object Detection and Gravity Vector.
	3:00	Amirali Ataee Naeini, Ashkan Teymouri, Ghazaleh Jafarsalehi and Michael H. Zhang. Enhanced Vehicle Speed Detection Considering Lane Recognition Using Drone Videos in California.	Siyuan Yao, Siavash Ghorbany, Meghan Forstchen, Alexis Korotas, Matthew Sisk, Ming Hu and Chaoli Wang. Leveraging Multimodal LLMs for Building Condition Assessment from Street-View Imagery.
	3:20	Manato Ishibashi, Koji Abe, Hitoshi Habe, Masayuki Otani and Nobukazu Iguchi. A Video-Based Fish Counting System for Juvenile Fish Transferred with Water Flow in Aquaculture.	Chenxuan Zhao. Taming Inversion Drift: A Dynamic Look-ahead Controller for Rectified Flow Models. (Recorded)
3:40-4:10	Coffee Break		
	4:10	Jen-Jui Liu, Curtis P. Evans and Randal W. Beard. A Geometry-Driven Approach to Detecting and Tracking Multiple Aerial Objects.	Priyanka Mudgal. Variable Rate Image Compression via N-Gram Context based Swin-transformer.
	4:30	Atharva Vaidya, Thomas Lindemeier, Marcel Walch and Daniel Werdehausen. Synthetic Data Enabled Under the Cover Human Pose Estimation using RGB Images. (Recorded)	Aminul Huq, Dimitris Zermas and George Bebis. Abnormality Detection in Maize Fields Using Selective Domain Adaptation-Driven Data Augmentation. (Recorded)
2:40-4:40	Object Detection and Recognition (Sunset 5&6) Chair: <u>Wei Zeng</u>		
	2:40	Thibault Lelong, Adrien Kinart and Matei Mancas. UniRare: Framework Reconciling Bottom-Up and Top-Down Attention in Visual Saliency.	
	3:00	Henry Velesaca Lara, Andrea Mero, Anjali Singh and Angel Sappa. The Hidden Cost of Poor Annotations: How Label Quality Affects Camouflaged Object Detection Performance. (Recorded)	
	3:20	Oussama Hadjerci, Antoine Letienne, Mohamed Abbas Hedjazi and Adel Hafiane. Self-supervised structured object representation learning.	
3:40-4:10	Coffee Break		
	4:10	Evan Inrig, Yixin Tan, Khoa Tran, Chris Ghim, Jessica Lee, Helen Holmlund and Fabien Scalzo. YOLOv8-Based Detection and Classification of Plant Cells in Light Micrographs.	
	4:30	Maria Tsiourva, Esten Ingar Grøtli and Tor Arne Johansen. Task-Conditioned Next-Fixation Prediction in Assembly Tasks.	

Tuesday, November 18th

9:00-10:00	<i>Keynote:</i> Sara Beery, Massachusetts Institute of Technology, USA (Wilshire A&B) Chair: <u>Jinwei Ye</u>		
	Parallel Sessions		
10:10-12:10	Medical Imaging (Wilshire A&B) Chair: <u>Subhashis Hazarika</u>		Virtual Reality (Sunset 3&4) Chair: <u>Ourania Spantidi</u>
	10:10	Qi Zhao, Qiyue Ma, Riqian Li and Wei Zeng. ColonMeshNet: Fusing Local and Global Context for Accurate 3D Colon Segmentation.	Christos Petrou, Harris Partaourides, Athanasios Balomenos, Yannis Kopsinis and Sotirios Chatzis. Gaze Prediction in Virtual Reality Without Eye Tracking Using Visual and Head Motion Cues. (Recorded)
	10:30	Dominic Flowers, Gavin Matoush, Jesse Wood and Ethan Shafer. Leveraging Autoencoder-Based Filters to Enhance Automated Medical Classifiers. (Recorded)	Dakota Kenoyer-Healy, Matthew Sturgeon, Russell Cohen Hoffing, Steven Thurman and Mohammed Safayet Arefin. Examining Visual Discomfort Associated with Perceived Depth Changes in Optical See-Through Augmented Reality.
	10:50	Sean Fletcher, Gabrielle Scott, Douglas Currie, Xin Zhang, Yuqi Song and Bruce MacLeod. Interpretable Tile-Based Classification of Paclitaxel Exposure.	Shuhei Takakai and Kazuo Misue. Evaluating Stepwise Increases in Degrees of Freedom from Walking to Manipulation for Immersive Analytics.
11:10-11:30	<i>Coffee Break</i>		
	11:30	Nickolas Littlefield, Michael Kann, Monjurul Islam, Maimouna Sanogo, Zoe Menezes, Fengyi Gao, Nicole Myers, Samuel Ewalefo, Macalus V. Hogan, Johannes F. Plate, Qiangqiang Gu and Ahmad P. Tafti. Self-Supervised Representation Learning for AI-Based Musculoskeletal Radiograph Registry Construction.	Shogo Arai, Takeshi Umezawa and Noritaka Osawa. Shadow-Based Touch Detection for Virtual Forearm Keyboards in AR Text Entry.
	11:50	Gaku Inoue, Koji Abe, Masahide Minami, Minoru Katsuki and Debabrata Roy. Features for Measuring the Progression of Gastric Atrophy Focused on Gastric Area Shadow Pattern in X-ray Images of Stomach.	Aymeric Fleith, Julian Zirbel, Daniel Cremers and Niclas Zeller. LiFMCr: Dataset and Benchmark for Light Field Multi-Camera Registration.
12:10-1:30	<i>Lunch Break</i>		

1:30-2:30	Keynote: Matthew O'Toole, Carnegie Mellon University, USA (Wilshire A&B) Chair: <u>Ahmad Tafti</u>	
	Parallel Sessions	
2:40-3:40	Segmentation (Wilshire A&B) Chair: <u>Ahmad Tafti</u>	3D (Sunset 3&4) Chair: <u>Fabrizio Soares</u>
	2:40 Taminul Islam, Toqi Tahamid Sarker, Mohamed Embaby, Khaled R Ahmed and Amer Abughazaleh. CarboFormer: A Lightweight Semantic Segmentation Architecture for Efficient Carbon Dioxide Detection Using Optical Gas Imaging.	Chashi Mahiul Islam, Oteo Mamo, Samuel Jacob Chacko, Xiuwen Liu and Weikuan Yu. Spatial-ViLT: Enhancing Visual Spatial Reasoning through Multi-Task Learning.
	3:00 Roman Strukov and Vassilis Athitsos. Towards Facilitating Manual Annotations of 3D Hand Pose by Making Predictions from Partial Annotations.	Wellington Rodrigues, Juliana Felix, Emilia Nogueira, Thamer Nascimento, Gabriel Vieira, Deborah Fernandes and Fabrizio Soares. Generating High-Fidelity Eucalyptus Point Clouds: A Comparative Study from GANs to Diffusion Models.
	3:20 Zhi Hu, Vijayalingam Aravindkumar, Kexin Yang and Zhonghuan Dai. Distribution-Preserving Data Curation for Semantic Segmentation	Yushan Wang and Norio Tagawa. Probabilistic Direct Structure from Motion via Hierarchical Reparameterization Trick.
3:40-4:10	<i>Coffee Break</i>	
2:40-3:40	Video Analysis and Event Recognition (Sunset 5&6) Chair: <u>Serestina Viriri</u>	
	2:40 Ruxandra Tapu and Bogdan Cosmin Mocanu. Seeing Through Words: A Zero-Shot Multimodal Audio Description System with Foundation Models.	
	3:00 Shaif Chowdhury, Mushfika Rahman Sharmin and Greg Hamerly. Supervised Contrastive Frame Aggregation for Video Representation Learning.	
	3:20 Chengzhang Wang, Jiahao Nie, Zhiwei He and Sotirios Chatzis. CMAD: Conditional Modeling-Adapter Diffusion for Video Super-Resolution. (Recorded)	
3:40-4:10	<i>Coffee Break</i>	
4:10-5:30	Poster Session (Wilshire A&B)	
6:30-9:30	Banquet Dinner & Best Paper Award (The Studio) Keynote: Shree Nayar, Columbia University, USA (at 8:00 pm) Chair: <u>George Bebis</u>	

Wednesday, November 19th

9:00-10:00	<i>Keynote: <u>Yifan Hu</u>, Northeastern University, USA (Wilshire A&B)</i> Chair: <u>Minglun Gong</u>		
	Parallel Sessions		
10:10-12:10	Biometrics (Wilshire A&B) Chairs: <u>Mircea Nicolescu</u>		Visualization (Sunset 3&4) Chair: <u>Minglun Gong</u>
	10:10	Evan Cornish, Seyedehhelya Hosseini Nami and Vassilis Athitsos. Dataset Bias in Hand Pose Estimation Benchmarks.	Subhashis Hazarika, Leonard Lupin-Jimenez, Rohit Vuppala, Ashesh Chattopadhyay and Hon Yung Wong. SWR-Viz: AI-assisted Interactive Visual Analytics Framework for Ship Weather Routing.
	10:30	Abhishek Tandon, Geetanjali Sharma, Gaurav Jaswal, Aditya Nigam and Raghavendra Ramachandra. FC-IQA: Forehead-Creases Biometric Image Quality Assessment and Evaluation.	Ruthuparna Naikar and Ying Zhu. Evaluating Prompting Strategies for Chart Question Answering with Large Language Models.
	10:50	Bijan Shahbaz Nejad, Peter Roch, Marcus Handte and Pedro José Marrón. Quantifying the Impact of Face Obfuscation on the Visual Extraction of Semantic Information.	Rifat Ara Proma, Ghulam Jilani Quadri and Paul Rosen. Evaluating Line Chart Strategies for Mitigating Density of Temporal Data: The Impact on Trend, Prediction, and Decision-Making. (Recorded)
11:10-11:30	Coffee Break		
	11:30	Geetanjali Sharma, Gaurav Jaswal, Aditya Nigam and Raghavendra Ramachandra. CLRecogEye : Curriculum learning towards exploiting convolution features for Dynamic Iris Recognition.	Jamilly Santos, Marcos Alves Vieira, Deborah Fernandes, Juliana Felix, Wellington Rodrigues, Fabrizzio Soares and Thamer Nascimento. Low-Cost Immersive Molecule Visualization from Hand-Drawn Smartwatch Input for Virtual Reality Learning.
	11:50	Lilian Bour, Sébastien Bougleux, Olivier Lézoray and Christophe Charrier. Improving GAN Inversion with Joint Identity and Attribute Constraints.	Navid Amini, Narges Ghasemi, Manveen Kaur, Mohammad Pourhomayoun and Kouros Nouri-Mahdavi. Assessment of Foot Clearance Impairments in Glaucoma Patients Using Smart Insoles.
12:10-1:30	Lunch Break		

1:30-2:30	<i>Keynote: <u>Despina Kontos</u>, Columbia University Irving Medical Center, USA (Wilshire A&B)</i> <i>Chair: <u>Rahul Singh</u></i>	
	Tutorials (for details, see https://www.isvc.net/index.php/tutorials/)	
	Tutorial 1 (Sunset 3&4) (~3.5 hours tutorial)	Tutorial 2 (Sunset 5&6) (~3 hours tutorial)
3:00-4:30	Transparent AI in Medical Imaging: Methods, Quantitative Metrics, and Clinical Translation <u>Organizers</u> Ahmad P. Tafti, University of Pittsburgh Qiangqiang Gu, University of Pittsburgh Dana Tudorascu, University of Pittsburgh Nickolas Littlefield, University of Pittsburgh Fengyi Gao, MS, University of Pittsburgh	Multimodal Vision-Language Large Models (VLLMs): Foundations, Tools, and Emerging Applications <u>Organizer</u> Reza Jalil Mozhdehi, GE HealthCare & Marquette University
4:30-4:50	<i>Coffee Break</i>	
4:50-6:50 (Tutorial 1) 4:50-6:20 (Tutorial 2)	Transparent AI in Medical Imaging: Methods, Quantitative Metrics, and Clinical Translation (cont'd)	Multimodal Vision-Language Large Models (VLLMs): Foundations, Tools, and Emerging Applications (cont'd)

Poster Session (Wilshire A&B)

Tuesday, November 18th (4:10pm - 5:30pm)
(poster set up: 12:15pm – 1:30pm or 3:40pm – 4:00pm)

Theodore Hartsook, Alireza Tavakkoli and Jonathan Greenberg. A conditional variational autoencoder to learn mappings between ALS and TLS measured forests.
Peter Roch, Lukas Laaser, Bijan Shahbaz Nejad, Marcus Handte and Pedro José Marrón. SLICE - Street-Level Insights from Camera Evidence.
Sandile Mhlanga and Serestina Viriri. Deep Learning-Based Infant Brain Tissue Segmentation using Attention-Gated U-Net.
Sayad Ibna Azad and Md. Atiqur Rahman. BdSL-SPOTER: A Transformer-Based Framework for Bengali Sign Language Recognition with Cultural Adaptation.
Vinod Rajendran. Point Cloud Fusion with Diffusion Models: An Integrated Pipeline for High-Quality Surround View Rendering.
Manikanta Kotthapalli and Banafsheh Rekabdar. Hierarchical Vector-Quantized Latents for Perceptual Low-Resolution Video Compression.
Jay Chaudhari, Hetav Raval, Hiren Galiyawala, Paawan Sharma and Mehul Raval. Multi-Query Person Retrieval on Edge Devices.
Cyrus Addy, Ajay Kumar Gurumadaiah, Yixiang Gao and Kwame Awuah-Offei. A Comprehensive Dataset for Underground Miner Detection in Diverse Scenario.
Misaki Okuda, Koji Abe, Masahide Minami and Debabrata Roy. Measurement of Screen-Based Computer Work Duration via Web Camera Applying YOLO for Facial Landmark Detection.
Jin Cho and Rahul Singh. Organoid Segmentation Using Phase Congruency and Persistent Homology.
Yanli Dong. Angle Based DTW for Large Vocabulary Sign Retrieval.
Jason Press, Fabien Scalzo and Gerard Fasel. Deep Learning-Based Declouding of the Aurora Borealis.
Chashi Mahiul Islam, Samuel Jacob Chacko, Preston Horne and Xiuwen Liu. Vision Embeddings and Their Role in Hallucination Vulnerabilities of Multimodal Large Language Models.
Gaetano Evangelista, Houston Lucas and Richard Kelley. Enhancing Infrastructure Monitoring with Calibrated Vision Language Model Ensembles: A Graffiti Detection Case Study.
Tristan Kenneweg, Philip Kenneweg and Barbara Hammer. Uncertainty-Aware Remaining Lifespan Prediction from Images.
Noyon Dey and Suchendra M. Bhandarkar. Exploratory Insights into Late-Fused Attribute Cues for RGB-based Military Vehicle Recognition.
Kaitlyn Tracy, William Dalian, Rami Dari and Ourania Spantidi. "Are We Going To Crash?": The Effect of an AI Presence in User Experience during a VR Flight.
Yuma Kokubu and Tomokazu Ishikawa. Evaluation of video augmentation effects and immersive experience in MR environments.

KEYNOTE TALK

Monday, November 17, 2025, at 9am (Wilshire A&B)

The Curious Case of Foundational and VLM Models

Leonid Sigal

University of British Columbia

Abstract: The capabilities and the use of foundational (FM) and vision-language (VLM) models in computer vision have exploded over the past few years. This has led to a broad paradigm shift in the field. In this talk I will focus on the recent work from my group that navigates this quickly evolving research landscape. Addressing challenges such as building foundational models with better generalization, increasing their context length, adopting them to ever evolving task landscape and routing information among them for more complex reasoning visual problems. I will also discuss some curious benefits and challenges of working with such models, including emergent (localization) capabilities and inconsistency in their responses.



Speaker Bio-Sketch: Prof. Leonid Sigal is a Professor at the University of British Columbia (UBC). He was appointed CIFAR AI Chair at the Vector Institute in 2019 and an NSERC Tier 2 Canada Research Chair in Computer Vision and Machine Learning in 2018. Prior to this, he was a Senior Research Scientist, and a group lead, at Disney Research. He completed his Ph.D at Brown University in 2008; received his B.Sc. degrees in Computer Science and Mathematics from Boston University in 1999, his M.A. from Boston University in 1999, and his M.S. from Brown University in 2003. Leonid's research interests lie in the areas of computer vision, machine learning, and computer graphics; with the emphasis on approaches for visual and multi-modal representation learning, recognition, understanding and generative modeling. He has won a number of research awards, including Killam Accelerator Fellowship in 2021 and has published over 100 papers in venues such as CVPR, ICCV, ECCV, NeurIPS, ICLR, and Siggraph.

KEYNOTE TALK

Monday, November 17, 2025, at 1:30pm (Wilshire A&B)

Reconstructing Reality: Creating Digital Twins for the Metaverse

Ming Lin

University of Maryland at College Park

Abstract: With increasing availability of data in various forms from images, audio, video, 3D models, motion capture, simulation results, to satellite imagery, representative samples of the various phenomena constituting the world around us bring new opportunities and research challenges. Such availability of data has led to recent advances in data-driven modeling. However, most of the existing example-based synthesis methods offer empirical models and data reconstruction that may not provide an insightful understanding of the underlying process or may be limited to a subset of observations. In this talk, I present recent advances that integrate classical model-based methods and statistical learning techniques to tackle challenging problems that have not been previously addressed. These include flow reconstruction for traffic visualization, learning heterogeneous crowd behaviors from video, simultaneous estimation of deformation and elasticity parameters from images and video, and example-based multimodal display for VR systems. These approaches offer new insights for learning and understanding complex collective behaviors, developing better models for complex dynamical systems from captured data, delivering more effective medical diagnosis and treatment, as well as cyber-manufacturing of customized apparel. I conclude by discussing some possible future directions and challenges.



Speaker Bio-Sketch: Ming C. Lin is currently Distinguished University Professor, Dr. Barry Mersky and Capital One E-Novate Endowed Professor, former Elizabeth Stevinson Iribe Chair of Computer Science at the University of Maryland College Park, and John R. & Louise S. Parker Distinguished Professor Emerita of Computer Science at the University of North Carolina (UNC), Chapel Hill. She is also an Amazon Scholar. She obtained her B.S., M.S., and Ph.D. in Electrical Engineering and Computer Science from the University of California, Berkeley. She received several honors and awards, including NSF Young Faculty Career Award, Honda Research Initiation Award, UNC/IBM Junior Faculty Development Award, UNC Hettleman Award for Scholarly Achievements, Beverly W. Long Distinguished Professorship, IEEE VGTC Virtual Reality Technical Achievement Award, and many best paper awards at international conferences. She is

a Fellow of National Academy of Inventors, ACM, IEEE, Eurographics, ACM SIGGRAPH Academy, and IEEE VR Academy. Her research interests include AI/ML, computational robotics, virtual reality, physically-based modeling, multimodal interaction, and geometric computing. She has (co-)authored more than 300 refereed publications in these areas and several books. She has served on hundreds of program committees of leading conferences and co-chaired dozens of international conferences and workshops. She is currently a member of Computing Research Association (CRA) and CRA-Widening Participation (CRA-WP) Board of Directors and Chair of IEEE Computer Society (CS) Goode Award Committee. She was a former chair of IEEE CS Computer Pioneer Award and IEEE CS Fellow committee, and the Founding Chair of ACM SIGGRAPH Outstanding Doctoral Dissertation Award. She is also a former member of IEEE CS Board of Governors, a former Editor-in-Chief of IEEE Transactions on Visualization and Computer Graphics (2011-2014), a former Chair of IEEE CS Transactions Operations Committee, and a member of several editorial boards. She also served on steering committees and advisory boards of several international conferences, government and industrial technical advisory committees.

KEYNOTE TALK

Tuesday, November 18, 2025, at 9am (Wilshire A&B)

AI and Biodiversity

Sara Beery

Massachusetts Institute of Technology

Abstract: Biodiversity is vital to sustainable development, public health, and ecosystem stability, and we are currently witnessing an unprecedented loss of biodiversity. To better understand and hopefully mitigate this loss, networks of ground-level sensors, satellites, drones, and community scientists are deployed to collect natural-world data at unprecedented scales. There is valuable scientific information stored in these raw data, the vast majority of which are as-yet inaccessible due to the time and resources needed to process the data by small groups of relevant human experts. AI is crucial to facilitate efficient extraction of scientific insights from quickly growing repositories of natural world imagery, and I will present several novel, application-driven innovations in AI which help realize the goal of global-scale, near-real-time biodiversity monitoring.



Speaker Bio-Sketch: Dr. Sara Beery is the Homer A. Burnell Career Development Professor in the MIT Faculty of Artificial Intelligence and Decision-Making. She received her PhD in Computing and Mathematical Sciences at Caltech, where she was advised by Pietro Perona. Her research focuses on building computer vision methods that enable global-scale environmental and biodiversity monitoring across data modalities, tackling real-world challenges including geospatial and temporal domain shift, learning from imperfect data, fine-grained categories, and long-tailed distributions. Her work has been recognized with a Schmidt Sciences AI2050 Early Career Fellowship, an NSF CAREER Grant, the Amori Doctoral Prize, an Amazon AI for Science Fellowship, a PIMCO Data Science Fellowship, and an NSF GRFP.

KEYNOTE TALK

Tuesday, November 18, 2025 at 1:30 pm (Wilshire A&B)

Computational Lensing

Matthew O'Toole

Carnegie Mellon University

Abstract: From the cameras in our phones to the lenses in VR headsets, optics shape how we capture and experience the world. In this talk, we explore the concept and implementation of a computational lens—a device that combines conventional optics and programmable elements to offer unprecedented control over how light is manipulated. Such lenses, for example, can enable spatially selective focusing or redistribute light to form arbitrary illumination patterns. These capabilities open new possibilities for imaging and display applications, including for 3D sensing, multifocal displays, and all-in-focus imaging.



Speaker Bio-Sketch: Matthew O'Toole is an Associate Professor with the Robotics Institute and Computer Science Department at Carnegie Mellon University. His research focuses on computational imaging: a field that combines optics, electronics, and computational processing to capture or display new forms of visual information. He received his Ph.D. from the University of Toronto, and was a Banting Postdoctoral Scholar at Stanford University. He is also the recipient of various awards, including an NSF CAREER award, a ACM SIGGRAPH Outstanding Thesis Honourable Mention award, several paper awards (ICCV 2025, CVPR 2025, SIGGRAPH 2023, CVPR 2022, CVPR 2014, and ICCV 2007), and best demo awards (ICCP 2023, CVPR 2015, and ICCP 2015).

BANQUET KEYNOTE TALK

Tuesday, November 18, 2025, at 8pm (The Studio)

Computational Imaging and Future Cameras

Shree Nayar, T. C. Chang Professor
Columbia University

Abstract: Computational imaging uses new optics to capture a coded image, and an appropriate algorithm to decode the captured image. This approach has enabled mobile devices to produce images that are rich, immersive and interactive. In this talk, we will show examples of computational cameras that are transforming the way visual information is captured, communicated and used by both humans and machines.



Speaker Bio-Sketch: Shree K. Nayar is the T. C. Chang Professor of Computer Science at Columbia University. He heads the Columbia Imaging and Vision Laboratory (CAVE), which develops computational imaging and computer vision systems. Nayar received his PhD degree in Electrical and Computer Engineering from the Robotics Institute at Carnegie Mellon University. For his research and teaching he has received several honors including the David Marr Prize (1990 and 1995), the David and Lucile Packard Fellowship (1992), the National Young Investigator Award (1993), the NTT Distinguished Scientific Achievement Award (1994), the Keck Foundation Award for Excellence in Teaching (1995), the Columbia Great Teacher Award (2006), the Carnegie Mellon Alumni Achievement Award (2009), Sony Appreciation Honor (2014), the Columbia Engineering Distinguished Faculty Teaching Award (2015), the IEEE PAMI Distinguished Researcher Award (2019), the Funai Achievement Award (2021), and the Okawa Prize (2022). For his contributions to computer vision and computational imaging, he was elected to the National Academy of Engineering in 2008, the American Academy of Arts and Sciences in 2011, and the National Academy of Inventors in 2014.

KEYNOTE TALK

Wednesday, November 19, at 9:00am (Wilshire A&B)

Towards Generative Human-Centric Network Visualization

Yifan Hu

Northeastern University

Abstract: Network visualization has traditionally relied on heuristics, assuming that optimizing specific metrics, such as stress, naturally leads to aesthetic and informative layouts. However, studies have shown that no single metric consistently produces the most effective visualization. We believe a data-driven alternative may offer a more human-centric solution. This involves collecting large amounts of human-labeled data, where human annotators indicate their preferred visualization among many options for the same graph. These data are then used to train a generative model to approximate human aesthetic preferences. In this talk, I will discuss our efforts in exploring the use of deep learning for this kind of human-centric network visualization. In particular, I will discuss our efforts in answering three questions: 1) Can deep learning models be used to optimize traditional aesthetic metrics? 2) Can deep learning models learn to produce effective layouts purely from examples of "good" visualizations? 3) Can vision models and LLMs predict and align with human aesthetic preferences?



Speaker Bio-Sketch: Yifan Hu is a Professor of Practice at Northeastern University. Before joining Northeastern, he was a Senior Manager of Science at Amazon, where he led a team of Applied Scientists developing AI and machine learning solutions for Amazon Search Advertising. Before that, he served as Senior Director of Research at Yahoo Research, focusing on machine learning, NLP, and data visualization applied to content, advertising, and security systems. Earlier in his career, he held research roles at AT&T Labs, Wolfram Research, and Daresbury Laboratory, working on graph visualization, recommender systems, optimization, and high-performance computing. He holds a B.S. and M.S. in Applied Mathematics from Shanghai Jiao Tong University and a Ph.D. in Optimization from Loughborough University. His research interests include information visualization, AI, machine learning, NLP, and large language models. His work has received multiple best paper awards, including the 2017 IEEE ICDM 10-Year Highest Impact Award for his work in recommender systems. He currently serves as an Associate Editor for the IEEE Transactions on Visualization and Computer Graphics.

KEYNOTE TALK

Wednesday, November 19, 2025 at 1:30pm (Wilshire A&B)

Radiomics, Radiogenomics, and AI: The Emerging Role of Imaging Biomarkers in Precision Cancer Care

Despina Kontos
Columbia University Irving Medical Center

Abstract: Cancer risk prediction is increasingly playing a key role in personalized screening and prevention. In addition, cancer is a heterogeneous disease, with known inter-tumor and intra-tumor heterogeneity in solid tumors. Established histopathologic prognostic biomarkers generally acquired from a tumor biopsy may be limited by sampling variation. Radiomics is an emerging field with the potential to provide novel markers of cancer risk, as well as leverage the whole tumor via non-invasive sampling to extract high throughput, quantitative features for the volumetric characterization of tumor heterogeneity. Recent studies have shown that radiomic phenotypes can also augment genetic and genomic assays in precision screening, prognosis, and treatment. Identifying novel computational imaging biomarkers and integrating them with other emerging prognostic and predictive markers with data science approaches and AI to better predict patient outcomes has a potential to ultimately transform precision cancer care.



Speaker Bio-Sketch: Dr. Despina Kontos, Ph.D., is the Herbert and Florence Irving Professor of Radiological Sciences (in Radiology and the Herbert Irving Comprehensive Cancer Center), Vice-Chair of AI, Data Science, and Engineering Research, and founding Director, Center for Innovation in Imaging Biomarkers and Integrated Diagnostics (CIMBID) at the Columbia University Irving Medical Center (CUIMC). She is also the inaugural Chief Research Information (CRIO) officer for CUIMC. Dr. Kontos received her C.Eng. Diploma in Computer Engineering and Informatics from the University of Patras in Greece and her MSc and Ph.D. degrees in Computer Science from Temple University in Philadelphia. She completed her postdoctoral training in radiologic physics and biostatistics at the University of Pennsylvania, and additional postgraduate training in Cancer Molecular Biology and Therapeutics from Harvard Medical School. Dr. Kontos' research interests lay in the interface of engineering, data science, and medical imaging applications. Most of her research to date has focused on leveraging the role of machine

learning and AI in investigating the role of imaging as a predictive biomarker for guiding precision cancer screening, prognosis, and treatment, while integrating with other emerging multi-omic biomarkers, such as molecular profiling, liquid biopsy, and the EHR. She has published more than 100 papers in this field, leading several research studies, funded by the NIH/NCI and private foundations.

Steering Committee

- Bebis George, University of Nevada, Reno (chair)
- Coquillart Sabine, INRIA
- Klosowski James, AT&T Labs Research
- Kuno Yoshinori, Saitama University
- Lin Steve, Microsoft
- Lindstrom Peter, Lawrence Livermore National Laboratory
- Moreland Kenneth, Oak Ridge National Laboratory
- Nefian Ara, NASA Ames Research Center
- Tafti Ahmad P., University of Pittsburgh

Area Chairs

Computer Vision

- Jinwei Ye, George Mason University, USA
- Yuxiong Wang, Univ of Illinois at Urbana-Champaign, USA

Computer Graphics

- Mina Konakovic Lukovic, MIT, USA
- Nima Khademi Kalantari, Texas A&M University, USA

Virtual Reality

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- Dana Tudorascu, University of Pittsburgh
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