

Gene Cheung

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Research Interest:

- **Graph Signal Processing:** Graph signal representation & restoration. Graph learning. Algorithm unrolling. Numerical linear algebra. Convex optimization.
- **3D Image Processing:** Processing of 3D data, including point clouds, multi-spectral satellite images, and light field images. Point cloud compression, denoising, super-resolution and inpainting.

Current Research:

Graph Spectral Processing of 3D Point Cloud

Point clouds (vital for virtual / augmented reality applications) are irregular samples of 2D object surfaces in 3D space. Using graph smoothness priors like graph Laplacian regularizer (GLR) and graph total variation (GTV), we denoise, super-resolve and inpaint point clouds by designing fast graph filtering algorithms, leveraging on convex optimization techniques like conjugate gradient and proximal gradient descent. Experimental results show vast improvement over competing algorithms objectively and subjectively.

Graph-based Classifier Learning

In a semi-supervised learning scenario, partially observed labels are inputted to a classifier to deduce labels of unclassified samples. We study this classifier learning problem from a graph signal processing (GSP) perspective: by viewing a binary classifier as a piecewise smooth graph signal in a suitable feature space, we perform classification in roughly linear time by solving the dual of a semi-definite programming (SDP) problem, leveraging our developed linear algebra theory *Gershgorin Disc Perfect Alignment* (GDPA). Simulation results show our classifier has competitive performance and scales well to very large datasets.

Eigen-Decomposition-Free Graph Sampling

Graph sampling—selecting a node subset to collect samples so that an assumed bandlimited / smooth graph signal is reconstructed in high fidelity—is a fundamental problem in graph signal processing (GSP). Existing graph sampling schemes require expensive computation of extreme eigenvectors for graph variation operators like the graph Laplacian matrix. In contrast, we design fast sampling algorithms for positive, signed, and directed graphs, based on a novel linear algebraic strategy called *Gershgorin disc alignment* (GDA), resulting in linear execution time. Applications include matrix completion, 3D point cloud sub-sampling, and short video summarization.

Education:

University of California, Berkeley, CA	May 2000
Doctor of Philosophy: Electrical Engineering	
Advisor: Professor Steven McCanne	
University of California, Berkeley, CA	May 1998
Master of Science: Electrical Engineering	Overall GPA: 3.805
Advisor: Professor Avideh Zakhor	
Cornell University, Ithaca, NY	May 1995
Bachelor of Science: Electrical Engineering	Overall GPA: 4.09

Work Experience:

Professor July 2022 - Present

Vice-Chair of Engineering (2022-2024) July 2022 - June 2024
 Associate Professor August 2018 - June 2022
 Dept. of EECS, York University, Toronto, Canada
 • Teach and conduct research on graph signal processing and 3D imaging.

Associate Professor April 2012 - July 2018
 National Institute of Informatics, Japan
 • Conduct research and advise graduate and intern students on the topics of image & video coding, streaming, and processing.

Assistant Professor November 2009 - March 2012
 National Institute of Informatics, Japan

Visiting Associate Professor April 2021 - Present
 Tokyo University of Agriculture and Technology, Japan

Visiting Associate Professor September 2018 - Present
 National Institute of Informatics, Japan

Adjunct Associate Professor January 2015 - December 2018
 The Hong Kong University of Science and Technology, Hong Kong

Senior Researcher August 2000 - October 2009
 Hewlett-Packard Laboratories, Japan
 • Conducted collaborative research with HP Labs Palo Alto and NTT DoCoMo on video coding and streaming over heterogeneous networks.
 • Co-advised graduate students in UC Davis on the topic of wireless video streaming.

MASH Research Group, UC Berkeley May 1997 - May 2000
 • Developed formal framework and algorithms for machine-dependent, computational optimization of signal processing and networking tasks.
 • Optimized IP address lookup by automatically generating an optimal search algorithm in native code, using a mixture of table lookups and programmed logic.
 • Investigated the generation of optimal unconstrained vector quantization encoder for a machine platform, by synthesizing existing VQ encoding techniques.

Member of Technical Staff Summer 1996
 Texas Instruments, Dallas TX
 • Participated in error resilient aspect of MPEG4 video coding standardization.
 • Hold an industrial patent for a search algorithm for optimal variable-length resynchronization codeword developed at TI.

Video & Image Processing Lab, UC Berkeley September 1995 - May 1997
 • Developed an optimal bit allocation strategy for unicast or multicast transmission of 3D subband encoded video signal across wireless links. The allocation algorithm is optimal up to a convex-hull approximation.

Awards & Recognition:

Major Awards:

- Best Student Paper Award Finalist at *IEEE International Conference on Acoustics, Speech and Signal Processing* 2021 (1 of 8 chosen from 3610 submitted papers).
- Recipient of the Natural Sciences Research Council (NSERC) Discovery Accelerator Supplement (DAS) 2019.
- Best Student Paper Award in *IEEE International Conference on Image Processing* 2017 (first prize from over 2000 submitted papers).
- IEEE Signal Processing Society (SPS) Japan Best Paper Award 2016.
- Best Student Paper Award in *IEEE International Conference on Image Processing* 2013 (1 of 3 chosen from 2102 submitted papers).
- Best Paper Runner-up Award (out of 609 papers submitted) in *IEEE International Con-*

ference on Multimedia and Expo 2012.

Other Recognition:

- Selected as York Research Chair (tier 2) from 2023 to 2028.
- Elevated to IEEE fellow for contributions in graph spectral image processing and interactive video streaming in 2021 (Signal Processing Society).
- Top reviewer recognition in *IEEE International Conference on Image Processing* 2020.
- Distinguished lecturer in APSIPA 2016-2017.
- Best Paper Award Finalist (8 out of 524 papers submitted) in *IEEE International Conference on Multimedia and Expo* 2015.
- MMTC Distinguished Service Award 2014.
- 1 of 3 PIs in Microsoft CORE9 program chosen for 1-year funding extension, June 2014.
- Ranked 2nd in the junior class of electrical engineering, Cornell University
- Dean's List honor in eight semesters
- 19th in Canada in a national mathematics competition as a high school sophomore.

Supervised Student Awards:

- Best Student Paper Award in *IEEE IVMSP Workshop* 2016.
- Two papers selected as Top 10% Accepted Paper Recognition at *IEEE International Conference on Image Processing* 2014.
- NII Graduate Student Award 2013-2014 for supervised graduate student Zhi Liu.
- Top 10% Paper Award in *IEEE Workshop on Multimedia Signal Processing* 2013.
- Two papers selected as Top 10% Accepted Paper Recognition at *IEEE International Conference on Image Processing* 2013.
- The Graduate University for Advanced Studies Sokendai President's Award 2013 for supervised graduate student Yunlong Feng.
- ICM English Session Encouragement Award 2012 for supervised graduate student Yunlong Feng.
- Best Reviewer Award in *Visual Communications and Image Processing* 2012 (6 of 200+ reviewers).
- Top 10% Paper Award in *IEEE Workshop on Multimedia Signal Processing* 2012.
- Best Paper Runner-up Award (out of 609 papers submitted) in *IEEE International Conference on Multimedia and Expo* 2012.
- The Graduate University for Advanced Studies Sokendai President's Award 2012 for supervised graduate student Zhi Liu.
- Best Poster Award in *Picture Coding Symposium Japan* 2011.
- Top 10% Paper Award in *IEEE Workshop on Multimedia Signal Processing* 2011.
- Best Paper Award Finalist (5 out of 2245 papers submitted) in *IEEE International Conference on Image Processing* 2011.
- Best Student Paper Award in *IEEE Workshop on Streaming and Media Communications* 2011 (in conjunction with ICME 2011).
- Best Paper Award Finalist (22 out of 744 papers submitted) in *IEEE International Conference on Multimedia and Expo* 2011.
- Top 15% Paper selected in *IEEE International Conference on Multimedia and Expo* 2011.
- Top 10% Paper Award in *IEEE Workshop on Multimedia Signal Processing* 2009.

Journal Publications:

75. Saghar Bagheri, Tam Thuc Do, Gene Cheung, Antonio Ortega, "Spectral Graph Learning with Core Eigenvectors Prior via Iterative GLASSO and Projection," accepted to *IEEE Transactions on Signal Processing*, July 2024.
74. Y. Parkizkar, G. Cheung, A. W. Eckford, "Signal Processing in the Retina: Graph-based Classifier to Predict Ganglion Cell Responses," *IEEE Open Journal on Signal Processing*, vol. 5, pp. 303-311, 2024.
73. F. Chen, G. Cheung, X. Zhang, "Manifold Graph Signal Restoration using Gradient Graph Laplacian Regularizer," *IEEE Transactions on Signal Processing*, vol. 72, pp.

744-761, 2024.

72. F. Wang, G. Cheung, M. Ye, T. Li, Y.-T. Feng, "Fast MSE-based Sampling of Bandlimited Graph Signals via Low-pass Impulse Responses," *IEEE Transactions on Signal Processing*, vol. 71, pp. 4207-4223, 2023.
71. X. Zhang, G. Cheung, J. Pang, Y. Sanghvi, A. Gnanasambandam, S. Chan, "Graph-based Depth Denoising & Dequantization for Point Cloud Enhancement," *IEEE Transactions on Image Processing*, vo.31, pp. 6863-6878, 2022.
70. F. Wang, G. Cheung, T. Li, Y. Du, Y.-P. Ruan, "Fast Sampling and Reconstruction for Linear Inverse problems: From Vectors to Tensors," *IEEE Transactions on Signal Processing*, vol. 70, pp. 6376-6391, 2022.
69. C. Dinesh, G. Cheung, I. V. Bajic, "Point Cloud Video Super-Resolution via Partial Point Coupling and Graph Smoothness," *IEEE Transactions on Image Processing*, vol. 31, pp. 4117-4132, 2022.
68. Y. Yuan, G. Cheung, P. Frossard, H. V. Zhao, J. Huang, "Landmarking for Navigational Streaming of Stored High-dimensional Media," *IEEE Transactions on Circuit and Systems for Video Technology*, vol. 32, no. 8, pp. 5663-5679, August 2022.
67. Y.-H. Chao, H. Hong, G. Cheung, A. Ortega, "Pre-demosaic Graph-based Light Field Image Compression," *IEEE Transactions on Image Processing*, vol. 31, pp. 1816-1829, 2022.
66. C. Dinesh, G. Cheung, I. V. Bajic, "Point Cloud Sampling via Graph Balancing and Gershgorin Disc Alignment," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 45, no. 1, pp. 868-886, January 2023.
65. C. Yang, G. Cheung, W. Hu, "Signed Graph Metric Learning via Gershgorin Disc Perfect Alignment," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 44, no. 10, pp. 7219-7234, October 2022.
64. X. Zhang, G. Cheung, Y. Zhao, P. Le Callet, C. Lin, J. Z. G. Tan, "Graph Learning based Head Movement Prediction for Interactive 360 Video Streaming," *IEEE Transactions on Image Processing*, vol.30, pp.4622-4636, 2021.
63. M. Ye, V. Stankovic, L. Stankovic, G. Cheung, "Robust Deep Graph Based Learning for Binary Classification," *IEEE Transactions on Signal and Information Processing over Networks* , vol.7, pp.322-335, November, 2020.
62. Y. Tanaka, Y. C. Eldar, A. Ortega, Gene Cheung, "Sampling on Graphs: From Theory to Applications," *IEEE Signal Processing Magazine*, vol.37, no.6, pp.14-30, November 2020.
61. F. Wang, Y. Wang, G. Cheung, C. Yang, "Graph Sampling for Matrix Completion Using Recurrent Gershgorin Disc Shift," *IEEE Transactions on Signal Processing*, vol. 68, pp. 1814-2829, April 2020.
60. W. Hu, X. Gao, G. Cheung, Z. Guo, "Feature Graph Learning for 3D Point Cloud Denoising," *IEEE Transactions on Signal Processing*, vol. 68, pp. 2841-2856, February 2020.
59. Y. Bai, F. Wang, G. Cheung, Y. Nakatsukasa, W. Gao, "Fast Graph Sampling Set Selection Using Gershgorin Disc Alignment," *IEEE Transactions on Signal Processing*, vol. 68, pp. 2419-2434, April 2020.
58. C. Dinesh, G. Cheung, I. Bajic, "Point Cloud Denoising via Feature Graph Laplacian Regularization," *IEEE Transactions on Image Processing*, vol. 29, pp. 4143-4158, January 2020.
57. J. Zeng, G. Cheung, M. Ng, J. Pang, C. Yang, "3D Point Cloud Denoising using Graph Laplacian Regularization of a Low Dimensional Manifold Model," *IEEE Transactions on Image Processing*, vol. 29, pp. 3474-3489, December 2019.

56. F. Wang, G. Cheung, Y. Wang, "Low-complexity Graph Sampling with Noise and Signal Reconstruction via Neumann Series," *IEEE Transactions on Signal Processing*, vol. 67, no.21, August 2019.
55. Y. Bai, G. Cheung, X. Liu, W. Gao, "Graph-Based Blind Image Deblurring from a Single Photograph," *IEEE Transactions on Image Processing*, vol. 28, no.3, pp.1404-1418, March 2019.
54. X. Liu, G. Cheung, X. Ji, D. Zhao, W. Gao, "Graph-based Joint Dequantization and Contrast Enhancement of Poorly Lit JPEG Images," *IEEE Transactions on Image Processing*, vol. 28, no.3, pp.1205-1219, March 2019.
53. G. Cheung, W.-T. Su, Y. Mao, C.-W. Lin, "Robust Semi-Supervised Graph Classifier Learning with Negative Edge Weights," *IEEE Transactions on Signal and Information Processing over Networks*, vol.4, no.4, pp.712-726, December 2018.
52. A. Zheng, G. Cheung, D. Florencio, "Joint Denoising / Compression of Image Contours via Shape Prior and Context Tree," *IEEE Transactions on Image Processing*, vol.27, no.7, pp.3332-3344, July 2018.
51. X. Liu, G. Cheung, C.-W. Lin, D. Zhao, W. Gao, "Prior-Driven Quantization Bin Matching for Cloud Storage of JPEG Images," *IEEE Transactions on Image Processing*, vol.27, no.7, pp.3222-3235, July 2018.
50. C. Dinesh, I. V. Bajic, G. Cheung, "Adaptive Non-Rigid Inpainting of 3D Point Cloud Geometry," *IEEE Signal Processing Letters*, vol.25, no.6, pp.878-882, June 2018.
49. G. Cheung, E. Magli, Y. Tanaka, M. Ng, "Graph Spectral Image Processing," *Proceedings of the IEEE*, vol.106, no.5, pp.907-930, May 2018.
48. A. De Abreu, G. Cheung, P. Frossard, F. Pereira, "Optimal Lagrange Multipliers for Dependent Rate Allocation in Video Coding," *Elsevier Signal Processing: Image Communications*, vol.63, pp.113-124, April 2018.
47. F. Wang, Y. Wang, G. Cheung, "A-Optimal Sampling and Robust Reconstruction for Graph Signals via Truncated Neumann Series," *IEEE Signal Processing Letters*, vol.25, no.5, pp.680-684, March 2018.
46. J. Tan, G. Cheung, R. Ma, "360-Degree Virtual-Reality Cameras for the Masses," *IEEE MultiMedia*, vol.25, no.1, pp.87-94, Jan.-Mar. 2018.
45. Y. Yuan, G. Cheung, P. Le Callet, P. Frossard, H. V. Zhao, "Object Shape Approximation & Contour Adaptive Depth Image Coding for Virtual View Synthesis," accepted to *IEEE Transactions on Circuits and Systems for Video Technology*, August 2017.
44. J. Zeng, G. Cheung, A. Ortega, "Bipartite Approximation for Graph Wavelet Signal Decomposition," *IEEE Transactions on Signal Processing*, vol.65, no.20, pp.5466-5480, October 2017.
43. C. Yang, G. Cheung, V. Stankovic, "Estimating Heart Rate and Rhythm via 3D Motion Tracking in Depth Video," *IEEE Transactions on Multimedia*, vol.19, no.7, pp.1625-1636, July 2017.
42. J. Pang, G. Cheung, "Graph Laplacian Regularization for Inverse Imaging: Analysis in the Continuous Domain," *IEEE Transactions on Image Processing*, vol.26, no.4, pp.1770-1785, April 2017. (citations: 110)
41. C. Yang, G. Cheung, V. Stankovic, K. Chan, N. Ono, "Sleep Apnea Detection via Depth Video & Audio Feature Learning," *IEEE Transactions on Multimedia*, vol.19, no.4, pp.822-835, April 2017.
40. A. Zheng, G. Cheung, D. Florencio, "Context Tree based Image Contour Coding using A Geometric Prior," *IEEE Transactions on Image Processing*, vol.26, no.2, pp.574-589, February 2017.

39. X. Liu, G. Cheung, X. Wu, D. Zhao, "Random Walk Graph Laplacian based Smoothness Prior for Soft Decoding of JPEG Images," *IEEE Transactions on Image Processing*, vol.26, no.2, pp.509-524, February 2017.
38. Y. Mao, G. Cheung, Y. Ji, "On Constructing z-dimensional DIBR-Synthesized Images," *IEEE Transactions on Multimedia*, vol.18, no.8, pp.1453-1468, August 2016.
37. W. Dai, G. Cheung, N.-M. Cheung, A. Ortega, O. Au, "Merge Frame Design for video Stream Switching using Piecewise Constant Function," *IEEE Transactions on Image Processing*, vol.25, no.8, pp.3489-3504, August 2016.
36. P. Wan, G. Cheung, D. Florencio, C. Zhang, O. Au, "Image Bit-depth Enhancement via Maximum-A-Posteriori Estimation of AC Signal," *IEEE Transactions on Image Processing*, vol.25, no.6, pp.2896-2909, June 2016.
35. L. Toni, G. Cheung, P. Frossard, "In-Network View Synthesis for Interactive Multiview Video Systems," *IEEE Transactions on Multimedia*, vol.18, no.5, pp.852-864, May 2016.
34. B. Zhang, Z. Liu, S.-H. Gary Chan, G. Cheung, "Collaborative Wireless Freeview Video Streaming with Network Coding," *IEEE Transactions on Multimedia*, vol.18, no.3, pp.521-536, March 2016.
33. W. Hu, G. Cheung, M. Kazui, "Graph-based Dequantization of Block-Compressed Piecewise Smooth Images," *IEEE Signal Processing Letters*, vol.23, no.2, pp.242-246, February 2016.
32. Y. Gao, G. Cheung, T. Maugey, P. Frossard, J. Liang, "Sender-driven Inpainting for Multiview Video Compression," *IEEE Transactions on Image Processing*, vol.25, no.1, pp.134-149, January 2016.
31. W. Hu, G. Cheung, A. Ortega, "Intra-Prediction and Generalized Graph Fourier Transform for Image Coding," *IEEE Signal Processing Letters*, vol.22, no.11, pp.1913-1917, November 2015.
30. P. Wan, G. Cheung, P. A. Chou, D. Florencio, C. Zhang, "Precision Enhancement of 3D Surfaces from Compressed Multiview Depth Maps," *IEEE Signal Processing Letters*, vol.22, no.10, pp.1676-1680, October 2015.
29. D. Ren, G. Chan, G. Cheung, V. Zhao, P. Frossard, "Collaborative Live Streaming of Free Viewpoint Video," *IEEE Transactions on Multimedia*, vol.17, no.3, pp.307-322, March 2015.
28. Z. Liu, G. Cheung, J. Chakareski, Y. Ji, "Multiple Description Coding & Recovery of Free Viewpoint Video for Wireless Network Streaming," special issue on "Visual Signal Processing for Wireless Networks" in *IEEE Journal of Selected Topics in Signal Processing*, vol.9, no.1, pp.151-164, February 2015.
27. W. Hu, G. Cheung, A. Ortega, O. Au, "Multi-resolution Graph Fourier Transform for Compression of Piecewise Smooth Images," *IEEE Transactions on Image Processing*, vol.24, no.1, pp.419-433, January 2015 (citations: 147).
26. I. Daribo, D. Florencio, G. Cheung, "Arithmetic Edge Coding and Arbitrarily Shaped Motion Prediction for Depth Video Coding," *IEEE Transactions on Image Processing*, vol.23, no.11, pp.4696-4708, November 2014.
25. D. Ren, G. Chan, G. Cheung, P. Frossard, "Coding Structure and Replication Optimization for Interactive Multiview Video Streaming," *IEEE Transactions on Multimedia*, vol.16, no.7, pp.1874-1887, November 2014.
24. W. Sun, G. Cheung, P. Chou, D. Florencio, C. Zhang, O. Au, "Rate-constrained 3D Surface Estimation from Noise-corrupted Multiview Depth Videos," *IEEE Transactions on Image Processing*, vol.23, no.7, pp.3138-3151, July 2014.

23. B. Hu, H. V. Zhao, G. Cheung, "Incentive Analysis for Cooperative Interactive Multi-view Video Streaming," *EURASIP Signal Processing: Image Communication*, vol.29, no.6, pp.641-666, April 2014.
22. B. Macchiavello, C. Dorea, E. M. Hung, G. Cheung, W.-t. Tan, "Loss-resilient Texture & Depth Map Coding in Multiview Video Conferencing," *IEEE Transactions on Multimedia*, vol.16, no.3, pp.711-725, April 2014.
21. H. Hadizadeh, I. V. Bajic, G. Cheung, "Video Error Concealment Using a Computation-efficient Low Saliency Prior," *IEEE Transactions on Multimedia*, vol.15, no.8, pp.2099-2113, December 2013.
20. Y. Feng, G. Cheung, W.-t. Tan, P. Le Callet, Y. Ji, "Low-Cost Eye Gaze Prediction in Interactive Networked Video Streaming," *IEEE Transactions on Multimedia*, vol.15, no.8, pp.1854-1879, December 2013.
19. Z. Liu, G. Cheung, Y. Ji, "Optimizing Unified Distributed Source Coding for Interactive Multiview Video Streaming," *IEEE Transactions on Circuits and Systems for Video Technology*, vol.23, no.10, pp.1781-1794, October 2013.
18. T. Maugey, I. Daribo, G. Cheung, P. Frossard, "Navigation Domain Partition for Interactive Multiview Imaging," *IEEE Transactions on Image Processing*, vol.22, no.9, pp.3459-3472, September 2013.
17. P. Wan, Y. Feng, G. Cheung, I. V. Bajic, O. C. Au, "3D Motion Estimation for Visual Saliency Modeling," *IEEE Signal Processing Letters*, vol.20, no.10, pp.972-975, June 2013.
16. X. Xiu, G. Cheung, J. Liang, "Delay-Cognizant Interactive Multiview Video with Free Viewpoint Synthesis," *IEEE Transactions on Multimedia*, vol.14, no.4, pp.1109-1126, August 2012.
15. G. Cheung, V. Velisavljević, Antonio Ortega "On Dependent Bit Allocation for Multiview Image Coding with Depth-image-based Rendering," *IEEE Transactions on Image processing*, vol.20, no.11, November 2011.
14. G. Cheung, A. Ortega, N.-M. Cheung, "Interactive Multiview Streaming of Stored Video using Redundant Frame Structures," *IEEE Transactions on Image Processing*, vol.20, no.3, pp.744-761, March 2011 (citations: 145).
13. X. Liu, G. Cheung, C.-N. Chuah, "Practical Joint Source/Channel Coding for a Cooperative Peer-to-Peer Collective using Network Coding," *IEEE Transactions on Circuits and Systems for Video Technology*, vol.21, no.1, pp.39-52, January 2011.
12. G. Cheung, J. Lee, S.-J. Lee, P. Sharma, "On the Complexity of System Throughput Derivation for 802.11 WLANs," *IEEE Communications Letters*, vol.14, no.10, pp.906-908, October 2010.
11. W.-t. Tan, G. Cheung, A. Ortega, B. Shen, "System and Optimizations for Community Streaming with Interactive Visual Overlays," *IEEE Transactions on Multimedia*, vol.11, no.5, pp.986-997, August 2009. (**atelier.fr published a news article on this work on 19th May 2009.**)
10. X. Liu, G. Cheung, C.-N. Chuah, "Structured Network Coding and Cooperative Wireless Ad-hoc Peer-to-Peer Repair for WWAN Video Broadcast," *IEEE Transactions on Multimedia*, vol.11, no.4, pp.730-741, June 2009.
9. G. Cheung, P. Sharma, S.-J. Lee, "Smart Media Striping over Multiple Burst-loss Channels," *IEEE Journal of Selected Topics in Signal Processing*, vol.1, no.2, pp.319-333, August 2007.
8. G. Cheung, W.-t. Tan, C. Chan, "Reference Frame Optimization for Multi-path Video Streaming with Complexity Scaling," *IEEE Transactions on Circuits and Systems for Video Technology*, vol.17, no.6, pp.649-662, June 2007.

7. G. Cheung, D. Li, C.-N. Chuah, "On the Complexity of Cooperative Peer-to-peer Repair for Wireless Broadcasting," *IEEE Communications Letters*, vol.10, no.11, pp.742-744, November 2006.
6. G. Cheung, W.-t. Tan, T. Yoshimura, "Real-time Video Transport Optimization Using Streaming Agent over 3G Wireless Networks," *IEEE Transactions on Multimedia*, vol.7, no.4, pp.777-785, August 2005.
5. D. Li, C.-N. Chuah, G. Cheung, S. J. Ben Yoo, "MUVIS: Multi-Source Video Streaming for Video-on-Demand over IEEE 802.11 WLAN," *Special Issue "Towards the Next Generation Mobile Communications" in Journal of Communications and Networks*, June 2005.
4. G. Cheung, W.-t. Tan, T. Yoshimura, "Double Feedback Streaming Agent for Real-time Delivery of Media over 3G Wireless Networks," *Special Issue on Streaming Video in IEEE Transactions on Multimedia*, vol.6, no.2, pp.304-314, April 2004. (acceptance rate: 21.9%)
3. G. Cheung, S. McCanne, "A Framework for Computation-Memory Algorithmic Optimization for Signal Processing," *IEEE Transactions on Multimedia*, vol.5, no.2, pp.174-185, June 2003.
2. G. Cheung, A. Zakhor, "Bit Allocation for Joint Source/Channel Coding of Scalable Video," *IEEE Transactions on Image Processing*, vol.9, no.3, pp.340-356, March 2000 (citations: 171).
1. R. Talluri, I. Moccagatta, Y. Nag, G. Cheung, "Error Concealment by Data Partitioning," *EURASIP Signal Processing: Image Communication*, 14, pp.505-518, May 1999.

Book & Book Chapters:

3. G. Cheung, E. Magli, editors for *Graph Spectral Image Processing*, ISTE & Wiley, August 2021.
2. N.-M. Cheung, G. Cheung, "Coding for Interactive Navigation in High-dimensional Media Data," book chapter to *Emerging Technologies for 3D Video*, Wiley, July 2012.
1. G. Cheung, A. Ortega, W.-s. Kim, V. Velisavljević, A. Kubota, "Depth Map Compression for Depth-Image-Based Rendering," book chapter to *3DTV System with Depth-Image-Based Rendering: Architectures, Techniques and Challenges*, Springer, May 2011.

Conference Publications:

202. Seyed Alireza Hosseini, Tam Thuc Do, Gene Cheung, Yuichi Tanaka, "Constructing an Interpretable Deep Denoiser by Unrolling Graph Laplacian Regularizer," accepted to *IEEE International Conference on Image Processing*, Abu Dhabi, UAE, October 2024.
201. Parham Eftekhari, Gene Cheung, Tim Eadie, "Declouding of Satellite Images for Crop Growth Monitoring via Unrolling of Gradient Graph Laplacian Regularizer," accepted to *IEEE International Conference on Image Processing*, Abu Dhabi, UAE, October 2024.
200. T. T. Do, P. A. Chou, G. Cheung, "Learned Nonlinear Predictor for Critically Sampled 3D Point Cloud Attribute Compression," accepted to *IEEE International Conference on Image Processing*, Abu Dhabi, UAE, October 2024.
199. F. Chen, G. Cheung, X. Zhang, "Soft Image Segmentation Using Gradient Graph Laplacian Regularizer," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Seoul, South Korea, April 2024.

198. T. T. Do, P. A. Chou, G. Cheung, "Volumetric 3D Point Cloud Attribute Compression: Learned Polynomial Bilateral Filter for Prediction," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Seoul, South Korea, April 2024.
197. N. Viswarupan, G. Cheung, F. Lan, M. S. Brown, "Mixed Graph Signal Analysis of Joint Image Denoising / Interpolation," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Seoul, South Korea, April 2024.
196. S. Bagheri, G. Cheung, T. Eadie, A. Ortega, "Joint Signal Interpolation / Time-Varying Graph Estimation via Smoothness and Low-rank Priors," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Seoul, South Korea, April 2024.
195. C. Dinesh, J. Wang, G. Cheung, P. Srikantha, "Complex Graph Laplacian Regularizer for Inferencing Grid States," *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, Glasgow, Scotland, October 2023.
194. C. Dinesh, G. Cheung, F. Chen, Y. Li, H. V. Zhao, "Modeling Viral Information Spreading via Directed Acyclic Graph Diffusion," accepted to *IEEE Global Communications Conference*, Kuala Lumpur, Malaysia, December 2023.
193. Y. Gharedaghi, G. Cheung, X. Liu, "Retinex-based Image Denoising / Contrast Enhancement using Gradient Graph Laplacian Regularizer," *IEEE International Conference on Image Processing*, Kuala Lumpur, Malaysia, October 2023.
192. S. Bagheri, G. Cheung, T. Eadie, "Graph Sparsification for GCN towards Optimal Crop Yield Prediction," *International Geoscience and Remote Sensing Symposium (IGARSS)*, Pasadena, CA, July 2023.
191. T. T. Do, Philip A. Chou, G. Cheung, "Volumetric Attribute Compression for 3D Point Clouds using FeedForward Network with Geometric Attention," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Rhodes, Greece, June 2023.
190. Y. Li, H. Vicky Zhao, G. Cheung, "Eigen-Decomposition-Free Directed Graph Sampling via Gershgorin Disc Alignment," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Rhodes, Greece, June 2023.
189. J. Zeng, Y. Liu, G. Cheung, W. Hu, "Sparse Graph Learning with Spectrum Prior for Deep Graph Convolutional Networks," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Rhodes, Greece, June 2023.
188. F. Lan, G. Cheung, P. Arora, D. Richard-Koko, L. Cole, "On Designing a 3D Imaging Summer Project for Ontario's High School Students during Covid-19 Pandemic," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Rhodes, Greece, June 2023.
187. S. Bagheri, T. T. Do, G. Cheung, A. Ortega, "Hybrid Model-based / Data-driven Graph Transform for Image Coding," *IEEE International Conference on Image Processing*, Bordeaux, France, October 2022.
186. R. Yoshida, K. Kodama, H. Vu, G. Cheung, T. Hamamoto, "Unrolling Graph Total Variation for Light Field Image Denoising," *IEEE International Conference on Image Processing*, Bordeaux, France, October 2022.
185. S. Bagheri, C. Dinesh, G. Cheung, T. Eadie, "Unsupervised Graph Spectral Feature Denoising for Crop Yield Prediction," *EUSIPCO'22*, Belgrade, Serbia, August 2022.
184. F. Wang, T. Li, M. Yi, G. Cheung, "MSE-Targeted Sampling of Bandlimited Graph Signals via Low-pass Graph Filtering Atoms," *EUSIPCO'22*, Belgrade, Serbia, August 2022.

183. F. Wang, T. Li, Y. Du, Y.-P. Ruan, G. Cheung, "Fast Sampling for Large-scale Linear Inverse Problem via Enlarging Principle Submatrix," *EUSIPCO'22*, Belgrade, Serbia, August 2022.
182. F. Chen, G. Cheung, X. Zhang, "Fast Computation of Generalized Eigenvectors for Graph Embedding," *IEEE Data Science and Learning Workshop (DSLW)*, Singapore, May 2022. (**25% acceptance rate.**)
181. S. Sahami, G. Cheung, C.-W. Lin, "Fast Graph Sampling for Short Video Summarization using Gershgorin Disc Alignment," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Singapore, May 2022.
180. C. Dinesh, S. Bagheri, G. Cheung, I. V. Bajic, "Linear-time Sampling on Signed Graphs via Gershgorin Disc Perfect Alignment," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Singapore, May 2022.
179. F. Chen, G. Cheung, X. Zhang, "Fast & Robust Image Interpolation using Gradient Graph Laplacian Regularizer," *IEEE International Conference on Image Processing*, Anchorage, Alaska, USA, September 2021.
178. H. Vu, G. Cheung, Y. C. Eldar, "Unrolling of Deep Graph Total Variation for Image Denoising," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Toronto, Canada, June 2021.
177. F. Wang, G. Cheung, Y. Wang, W.-Tian Tan, "Fast Manifold Landmarking using Extreme Eigen-pairs," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Toronto, Canada, June 2021.
176. S. Bagheri, G. Cheung, A. Ortega, Fen Wang, "Learning Sparse Graph Laplacian with K Eigenvector Prior via Iterative GLASSO and Projection," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Toronto, Canada, June 2021.
175. C. Dinesh, G. Cheung, F. Wang, I. V. Bajic, "Sampling of 3D Point Cloud via Gershgorin Disc Alignment," *IEEE International Conference on Image Processing*, Abu Dhabi, United Arab Emirates, October 2020.
174. X. Zhang, G. Cheung, J. Pang, D. Tian, "3D Point Cloud Enhancement Using Graph-Modelled Multiview Depth Measurements," *IEEE International Conference on Image Processing*, Abu Dhabi, United Arab Emirates, October 2020.
173. F. Lan, C. Yang, G. Cheung, J. Z. G. Tan, "Joint Demosaicking / Rectification of Fisheye Camera Images Using Multi-Color Graph Laplacian Regularization," *IEEE International Conference on Image Processing*, Abu Dhabi, United Arab Emirates, October 2020.
172. C. Yang, G. Cheung, W. Hu, "Fast Graph Metric Learning via Gershgorin Disc Alignment," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Barcelona, Spain, May 2020.
171. X. Zhang, G. Cheung, P. Le Callet, J. Z. G. Tan, "Sparse Directed Graph Learning for Head Movement Prediction in 360 Video Streaming," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Barcelona, Spain, May 2020.
170. X. Jiang, C. Yang, G. Cheung, S. Takamura, "Semi-Regular Geometric Kernel Encoding & Reconstruction for Video Compression," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Barcelona, Spain, May 2020.
169. W.-t. Su, G. Cheung, R. Wildes, C.-W. Lin, "Graph Neural Net using Analytical Graph Filters and Topology Optimization for Image Denoising," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Barcelona, Spain, May 2020.
168. C. Dinesh, G. Cheung, I. Bajic, "Super-Resolution of 3D Point Cloud via Fast Graph Total Variation," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Barcelona, Spain, May 2020.

167. C. Dinesh, G. Cheung, I. Bajic, "3D Point Cloud Super-Resolution via Graph Total Variation on Surface Normals," *IEEE International Conference on Image Processing*, Taipei, Taiwan, September 2019.
166. C. Dinesh, G. Cheung, I. Bajic, "3D Point Cloud Color Denoising Using Convex Graph-Signal Smoothness Priors," *IEEE 21st International Workshop on Multimedia Signal Processing*, Kuala Lumpur, Malaysia, September 2019.
165. J. Zeng, J. Pang, W. Sun, G. Cheung, "Deep Graph Laplacian Regularization for Robust Denoising of Real Images," *IEEE CVPR New Trends in Image Restoration and Enhancement (NTIRE) Workshop*, Long Beach, CA June 2019.
164. Y. Bai, G. Cheung, F. Wang, X. Liu, W. Gao, "Reconstruction-Cognizant Graph Sampling Using Gershgorin Disc Alignment," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Brighton, UK, May, 2019.
163. F. Wang, G. Cheung, Y. Wang, "Fast Sampling of Graph Signals with Noise via Neumann Series Conversion," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Brighton, UK, May, 2019.
162. M. Ye, V. Stankovic, L. Stankovic, G. Cheung, "Deep Graph Regularized Learning for Binary Classification," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Brighton, UK, May, 2019.
161. C. Yang, G. Cheung, V. Stankovic, "Alternating Binary Classifier and Graph Learning from Partial Labels," *APSIPA ASC 2018*, Hawaii, USA, November 2018.
160. W. Liao, G. Cheung, S. Muramatsu, H. Yasuda, K. Kayasaka, "Graph Learning & Fast Transform Coding of 3D River Data," *APSIPA ASC 2018*, Hawaii, USA, November 2018.
159. E. Peixoto, B. Macchiavello, E. M. Hung, G. Cheung, "Progressive Sub-Aperture Image Recovery for Interactive Light Field Data Streaming," *IEEE International Conference on Image Processing*, Athens, Greece, October, 2018.
158. C. Yang, G. Cheung, S. Takamura, "RD-Optimized 3D Planar Model Reconstruction & Encoding for Video Compression," *IEEE International Conference on Image Processing*, Athens, Greece, October, 2018.
157. W. Liao, G. Cheung, W. Hu, "Path Coding on Geometric Planar Graph for 2D / 3D Visual Data Partitioning," *IEEE International Conference on Image Processing*, Athens, Greece, October, 2018.
156. Q. Chang, G. Cheung, Y. Zhao, X. Li, R. Ni, "Non-local Graph-based Prediction for Reversible Data Hiding in Images," *IEEE International Conference on Image Processing*, Athens, Greece, October, 2018.
155. W.-T. Su, C.-C. Hsu, Z. Huang, C.-W. Lin, G. Cheung, "Joint Pairwise Learning and Image Clustering based on a Siamese CNN," *IEEE International Conference on Image Processing*, Athens, Greece, October, 2018.
154. W. De Souza, B. Macchiavello, E. Peixoto, E. M. Hung, G. Cheung, "A Sub-Aperture Image Selection Refinement Method for Progressive Light Field Transmission," *IEEE 20th International Workshop on Multimedia Signal Processing*, Vancouver, Canada, August 2018.
153. C. Dinesh, G. Cheung, I. V. Bajic, C. Yang, "Fast 3D Point Cloud Denoising via Bipartite Graph Approximation & Total Variation," *IEEE 20th International Workshop on Multimedia Signal Processing*, Vancouver, Canada, August 2018.
152. S. Ling, G. Cheung, P. Le Callet, "No-Reference Quality Assessment for Stitched Panoramic Images using Convolutional Sparse Coding and Compound Feature Selection," *IEEE International Conference on Multimedia and Expo*, San Diego, CA, July, 2018.

151. S. Yang, G. Cheung, J. Liu, Z. Guo, "Soft Decoding of Light Field Images using POCS and Fast Graph Spectral Filters," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Calgary, Canada, April, 2018.
150. Y. Bai, G. Cheung, X. Liu, W. Gao, "Blind Image Deblurring via Reweighted Graph Total Variation," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Calgary, Canada, April, 2018.
149. S. Ling, P. Le Callet, G. Cheung, "Quality Assessment for Synthesized View based on Variable-length Context Tree," *IEEE 19th International Workshop on Multimedia Signal Processing*, London-Luton, UK, October, 2017.
148. M. Kaneko, G. Cheung, W.-t. Su, C.-W. Lin, "Graph-based Joint Signal / Power Restoration for Energy Harvesting Wireless Sensor Networks," *IEEE Globecom*, Singapore, December, 2017.
147. E. Piexoto, B. Macchiavello, E. M. Hung, C. Dorea, G. Cheung, "Progressive Communication for Interactive Light Field Data Streaming," *IEEE International Conference on Image Processing*, Beijing, China, September, 2017.
146. M. Zhao, G. Cheung, D. Florencio, X. Ji, "Progressive Graph-Signal Sampling and Encoding for Static 3D Geometry Representation," *IEEE International Conference on Image Processing*, Beijing, China, September, 2017.
145. W.-T. Su, G. Cheung, C.-W. Lin, "Graph Fourier Transform with Negative Edges for Depth Image Coding," *IEEE International Conference on Image Processing*, Beijing, China, September, 2017.
144. Y. Yuan, G. Cheung, P. Frossard, "Optimizing Landmark Insertions for Interactive Light Field Streaming," *IEEE International Conference on Image Processing*, Beijing, China, September, 2017.
143. Y.-H. Chao, G. Cheung, A. Ortega, "Pre-Demosiac Light Field Image Compression Using Graph Lifting Transform," *IEEE International Conference on Image Processing*, Beijing, China, September, 2017. **(Best Student Paper Award (first prize) out of over 2000 submissions.)**
142. J. Zeng, G. Cheung, Y.-H. Chao, I. Blanes, J. Serra-Sagrasta, A. Ortega, "Hyperspectral Image Coding using Graph Wavelets," *IEEE International Conference on Image Processing*, Beijing, China, September, 2017.
141. W.-T. Su, G. Cheung, C.-W. Lin, "Robust Graph-based Image Classifier Learning with Negative Edge Weights," *IEEE International Conference on Multimedia and Expo*, Hong Kong, China, July, 2017.
140. Benjamin Renoust, Gene Cheung, Shin'Ichi Satoh, "Estimating Political Leanings from Mass Media via Graph-Signal Restoration with Negative Edges," *IEEE International Conference on Multimedia and Expo*, Hong Kong, China, July, 2017.
139. Y. Mao, G. Cheung, C.-W. Lin, Y. Ji, "Joint Learning of Similarity Graph and Image Classifier from Partial Labels," *APSIPA ASC*, Jeju, Korea, December, 2016.
138. Y. Rai, P. Le Callet, G. Cheung, "Role of HEVC Coding Artifacts on Gaze Prediction in Interactive Video Streaming Systems," *IEEE International Conference on Image Processing*, Phoenix, USA, September, 2016.
137. B. Motz, G. Cheung, A. Ortega, "Redundant Frame Structure Using M-Frame for Interactive Light Field Streaming," *IEEE International Conference on Image Processing*, Phoenix, USA, September, 2016.
136. A. Zheng, G. Cheung, D. Florencio, "Joint Denoising / Compression of Image Contours via Geometric Prior and Variable-length Context Tree," *IEEE International Conference on Image Processing*, Phoenix, USA, September, 2016.

135. B. Motz, G. Cheung, N.-M. Cheung, "Designing Coding Structures with Merge Frames for Interactive Multiview Video Streaming," *22nd International Packet Video Workshop*, Seattle, USA, July, 2016.
134. Y. Mao, G. Cheung, C.-W. Lin, Y. Ji, "Image Classifier Learning from Noisy Labels via Generalized Graph Smoothness Priors," *IEEE IVMSWP Workshop*, Bordeaux, France, July, 2016 (**Best Student Paper Award**).
133. S. Yang, G. Cheung, P. Le Callet, J. Liu, Z. Guo, "Computational Modeling of Artistic Intention: Quantify Lighting Surprise for Painting Analysis," *IEEE International Conference on Multimedia Experience (QoMEX)*, Lisbon, Portugal, June, 2016.
132. B. Motz, G. Cheung, P. Frossard, "Graph-based Representation and Coding of 3D Images for Interactive Multiview Navigation," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Shanghai, China, March, 2016.
131. X. Liu, G. Cheung, C.-W. Lin, D. Zhao, "Quantization Bin Matching for Cloud Storage of JPEG Images," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Shanghai, China, March, 2016. (**Joint patent filed with Peking University, China**)
130. J. Zeng, G. Cheung, A. Ortega, "Bipartite Subgraph Decomposition for Critically Sampled Wavelet Filterbanks on Arbitrary Graphs," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Shanghai, China, March, 2016.
129. B. Motz, G. Cheung, A. Ortega, P. Frossard, "Re-sampling and Interpolation of DIBR-synthesized Images using Graph-signal Smoothness Prior," *APSIPA ASC*, Hong Kong, China, December, 2015.
128. H. Zheng, G. Cheung, L. Fang, "Analysis of Sports Statistics via Graph-Signal Smoothness Prior," *APSIPA ASC*, Hong Kong, China, December, 2015.
127. I. Rotondo, G. Cheung, A. Ortega, H. Egilmez, "Designing Sparse Graphs via Structure Tensor for Block Transform Coding of Images," *APSIPA ASC*, Hong Kong, China, December, 2015.
126. X. Liu, G. Cheung, D. Zhai, D. Zhao, "Sparsity-based Joint Gaze Correction and Face Beautification for Conference Video," *IEEE International Conference on Visual Communications and Image Processing (VCIP)*, Singapore, December, 2015.
125. Y. Yuan, G. Cheung, P. Frossard, P. Le Callet, V. H. Zhao, "Piecewise Smooth Depth Image Approximation & Coding for Virtual View Synthesis," *IEEE International Workshop on Multimedia Signal Processing*, Xiamen, China, October, 2015.
124. L. Toni, G. Cheung, P. Frossard "In-Network View Re-Sampling for Interactive Free Viewpoint Video Streaming," *IEEE International Conference on Image Processing*, Quebec City, September, 2015.
123. X. Liu, G. Cheung, X. Wu, "Inter-Block Soft Decoding of JPEG Images with Sparsity and Graph-Signal Smoothness Priors," *IEEE International Conference on Image Processing*, Quebec City, September, 2015.
122. Y.-H. Chao, A. Ortega, W. Hu, G. Cheung, "Edge-Adaptive Depth Map Coding with Lifting Transform on Graphs," *31st Picture Coding Symposium*, Cairns, Australia, May, 2015.
121. C. Yang, G. Cheung, V. Stankovic, "Estimating Heart Rate via Depth Video Motion Tracking," *IEEE International Conference on Multimedia and Expo*, Torino, Italy, June, 2015 (**One of 8 Best Paper Finalists selected from 524 submitted papers**).
120. X. Liu, G. Cheung, X. Wu, "Joint Denoising and Contrast Enhancement of Images using Graph Laplacian Operator," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Brisbane, Australia, April, 2015.

119. J. Pang, G. Cheung, A. Ortega, O. C. Au, "Optimal Graph Laplacian Regularization for Natural Image Denoising," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Brisbane, Australia, April, 2015.
118. J. Pang, G. Cheung, W. Hu, O. C. Au, "Redefining Self-Similarity in Natural Images for Denoising Using Graph Signal Gradient," *APSIPA ASC*, Siem Reap, Cambodia, December, 2014.
117. S. Reel, P. Wong, G. Cheung, L. S. Dooley, "Disocclusion Hole-Filling in DIBR-Synthesized Images using Multi-Scale Template Matching," *IEEE Visual Communications and Image Processing (VCIP)*, Valletta, Malta, December, 2014.
116. X. Liu, G. Cheung, D. Zhai, D. Zhao, H. Sankoh, S. Naito, "Joint Gaze-Correction and Beautification of DIBR-Synthesized Human Face via Dual Sparse Coding," *IEEE International Conference on Image Processing*, Paris, France, October, 2014. (**Joint patent filed with KDDI**)
115. P. Wan, G. Cheung, D. Florencio, C. Zhang, O. Au, "Image Bit-depth Enhancement via Maximum-a-Posteriori Estimation of Graph AC Component," *IEEE International Conference on Image Processing*, Paris, France, October, 2014. (**Top 10% paper award.**)
114. W. Hu, G. Cheung, X. Li, O. Au, M. Kazui, "Graph-based Joint Denoising and Super-resolution of Generalized Piecewise Smooth Images," *IEEE International Conference on Image Processing*, Paris, France, October, 2014. (**Top 10% paper award.**)
113. C. Yang, Y. Mao, G. Cheung, V. Stankovic, K. Chan, "Graph-based Depth Video Denoising and Event Detection for Sleep Monitoring," *IEEE International Workshop on Multimedia Signal Processing*, Jakarta, Indonesia, September, 2014.
112. C. Yang, G. Cheung, K. Chan, V. Stankovic, "Sleep Monitoring via Depth Video Recording & Analysis," *5th IEEE International Workshop on Hot Topics in 3D (Hot3D)*, Chengdu, China, July, 2014.
111. Y. Mao, G. Cheung, Y. Ji, "Image Interpolation During DIBR View Synthesis Using Graph Fourier Transform," *3DTV-Conference 2014*, Budapest, Hungary, July, 2014.
110. B. Macchiavello, C. Dorea, E. M. Hung, G. Cheung, I. Bajic, "Low-Saliency Prior for Disocclusion Hole Filling in DIBR-Synthesized Images," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Florence, Italy, May, 2014.
109. Y. Gao, G. Cheung, T. Maugey, P. Frossard, J. Liang, "3D Geometry Representation using Multiview Coding of Image Tiles," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Florence, Italy, May, 2014.
108. Y. Mao, G. Cheung, Y. Ji, "Graph-based Interpolation for DIBR-synthesized Images with Nonlocal Means," invited paper to *Symposium on Graph Signal Processing in IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Austin, Texas, December, 2013.
107. S. Reel, G. Cheung, P. Wong, L. S. Dooley, "Joint Texture-Depth Pixel Inpainting of Disocclusion Holes in Virtual View Synthesis," special session on "3D visual representation and coding" in *APSIPA ASC*, Kaohsiung, Taiwan, October, 2013.
106. W. Hu, X. Li, G. Cheung, O. Au, "Depth Map Denoising using Graph-based Transform and Group Sparsity," *IEEE International Workshop on Multimedia Signal Processing*, Pula (Sardinia), Italy, October, 2013. (**Top 10% paper award.**)
105. Y. Wang, A. Ortega, G. Cheung, "Intra Predictive Transform Coding based on Predictive Graph Transform," *IEEE International Conference on Image Processing*, Melbourne, Australia, September, 2013.

104. B. Macchiavello, C. Dorea, E. M. Hung, G. Cheung, W.-t. Tan, "Saliency-cognizant Robust View Synthesis in Free Viewpoint Video Streaming," *IEEE International Conference on Image Processing*, Melbourne, Australia, September, 2013.
103. Y. Gao, G. Cheung, J. Liang, "Rate-complexity Tradeoff for Client-side Free Viewpoint Image Rendering," *IEEE International Conference on Image Processing*, Melbourne, Australia, September, 2013.
102. W. Dai, G. Cheung, N.-M. Cheung, A. Ortega, O. Au, "Rate-distortion Optimized Merge Frame using Piecewise Constant Functions," *IEEE International Conference on Image Processing*, Melbourne, Australia, September, 2013. (**Joint patent filed with HKUST**) (**Best student paper award, 1 of 3 chosen from almost 2200 submitted papers.**)
101. Y. Yuan, B. Hu, G. Cheung, V. Zhao, "Optimizing Peer Grouping for Live Free Viewpoint Video Streaming," *IEEE International Conference on Image Processing*, Melbourne, Australia, September, 2013. (**Top 10% accepted paper recognition (top 4.5% of submitted papers)**)
100. W. Sun, G. Cheung, P. Chou, D. Florencio, C. Zhang, O. Au, "Rate-distortion Optimized 3D Reconstruction from Noise-corrupted Multiview Depth Videos," *IEEE International Conference on Multimedia and Expo*, San Jose, CA, July 2013. (**Accepted for oral presentation (top 12.7%).**)
99. P. Wan, G. Cheung, P. Chou, D. Florencio, C. Zhang, O. Au, "Precision Enhancement of 3D Surfaces from Multiple Quantized Depth Maps," *11th IEEE IVMSW Workshop: 3D Image/Video Technologies and Applications*, Seoul, Korea, June, 2013.
98. Y. Mao, G. Cheung, A. Ortega, Y. Ji, "Expansion Hole Filling in Depth-Image-Based Rendering using Graph-based Interpolation," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Vancouver, Canada, May 2013.
97. P. Wan, Y. Feng, G. Cheung, I. V. Bajic, O. Au, Y. Ji, "3D Motion in Visual Saliency Modeling," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Vancouver, Canada, May 2013.
96. Y. Mao, G. Cheung, Y. Ji, "Depth-Layer-based Multiview Image Synthesis & Coding for Interactive z- and x-coordinate view switching," *IS&T/SPIE Visual Information Processing and Communication Conference*, Burlingame, CA, January 2013.
95. Z. Liu, G. Cheung, J. Chakareski, Y. Ji, "Multiple Description Coding of Free Viewpoint Video for Multi-Path Network Streaming," *IEEE Globecom*, Anaheim, CA, December 2012.
94. Y. Feng, G. Cheung, W.-t. Tan, Y. Ji, "Gaze-driven Video Streaming System with Saliency-based Dual-stream Switching," *SPIE Visual Communications and Image Processing Conference (VCIP)*, San Diego, CA, November 2012.
93. Y. Gao, G. Cheung, J. Liang, A. Kaup, "Optimizing Frame Structure with Real-time Computation for Interactive Multiview Video Streaming," *3DTV-Conference 2012*, Zurich, Switzerland, October 2012.
92. I. Daribo, G. Cheung, T. Maugey, P. Frossard, "RD Optimized Auxiliary Information for Inpainting-based View Synthesis," *3DTV-Conference 2012*, Zurich, Switzerland, October 2012.
91. G. Cheung, J. Ishida, A. Kubota, A. Ortega, "Quality-optimized Encoding of JPEG Images using Transform Domain Sparsification," *IEEE International Workshop on Multimedia Signal Processing*, Banff, Canada, September 2012. (**Top 10% paper award.**)

90. T. Maugey, P. Frossard, G. Cheung, "Temporal and View Constancy in an Interactive Multiview Streaming System," *IEEE International Conference on Image Processing*, September 2012.
89. I. Daribo, G. Cheung, D. Florencio, "Arithmetic Edge Coding for Arbitrarily Shaped Sub-block Motion Prediction in Depth Video Coding," *IEEE International Conference on Image Processing*, September 2012. (**patent filed.**)
88. W. Hu, G. Cheung, X. Li, O. Au, "Depth Map Compression using Multi-resolution Graph-based Transform for Depth-image-based Rendering," *IEEE International Conference on Image Processing*, September 2012. (**patent filed.**)
87. B. Macchiavello, C. Dorea, E. M. Hung, G. Cheung, W.-t. Tan, "Reference Frame Selection for Loss-resilient Texture & Depth Map Coding in Multiview Video Conferencing," *IEEE International Conference on Image Processing*, September 2012.
86. W. Hu, G. Cheung, X. Li, O. Au, "Depth Map Super-resolution Using Synthesized View Matching for Depth-image-based Rendering," *3rd International Workshop on Hot Topics in 3D* (in conjunction with ICME 2012), Melbourne, Australia, July 2012.
85. H. Hadizadeh, I. Bajic, G. Cheung, "Saliency-cognizant Error Concealment in Loss-corrupted Streaming Video," *IEEE International Conference on Multimedia and Expo*, Melbourne, Australia, July 2012. (**Best Paper Runner-up Award selected from 609 submitted papers**).
84. Z. Liu, G. Cheung, Y. Ji, "Unified Distributed Source Coding Frames for Interactive Multiview Video Streaming," *IEEE International Conference on Communications*, Ottawa, Canada, June 2012.
83. H. Huang, G. Chan, G. Cheung, P. Frossard, "Distributed Content Replication for Multiple Movies in Interactive Multiview Video Streaming," *19th International Packet Video Workshop*, Munich, Germany, May 2012.
82. G. Valenzise, G. Cheung, R. Galvao, M. Cagnazzo, B. Pesquet-Popescu, A. Ortega, "Motion Prediction of Depth Video for Depth-Image-Based Rendering Using Don't Care Regions," *Picture Coding Symposium 2012*, Krakow, Poland, May 2012.
81. I. Daribo, D. Florencio, G. Cheung, "Arbitrarily Shaped Sub-block Motion Prediction in Texture Map Compression using Depth Information," *Picture Coding Symposium 2012*, Krakow, Poland, May 2012.
80. B. Hu, G. Cheung, V. Zhao, "Incentive Analysis for Cooperative Distribution of Interactive Multiview Video," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Kyoto, Japan, March 2012.
79. W. Cai, G. Cheung, S.-J. Lee, T. Kwon, "Optimal Frame Structure Design using Landmarks for Interactive Light Field Streaming," *IEEE International Conference on Acoustics, Speech and Signal Processing*, Kyoto, Japan, March 2012.
78. H. Huang, B. Zhang, G. Chan, G. Cheung, P. Frossard, "Coding and Caching Co-Design for Interactive Multiview Video Streaming," mini-conference in *IEEE INFO-COM 2012*, Orlando, Florida, March 2012.
77. Y. Feng, G. Cheung, P. Le Callet, Y. Ji, "Video Attention Deviation Estimation using Inter-Frame Visual Saliency Map Analysis," *IS&T/SPIE Visual Information Processing and Communication Conference*, Burlingame, CA, January 2012.
76. B. Macchiavello, M. Hung, C. Dorea, G. Cheung, W.-t. Tan, "Reference Frame Selection for Loss-resilient Depth Map Coding in Multiview Video Conferencing," *IS&T/SPIE Visual Information Processing and Communication Conference*, Burlingame, CA, January 2012.

75. Z. Liu, G. Cheung, Y. Ji, "Distributed Markov Decision Process in Cooperative Peer Recovery for WWAN Multiview Video Multicast," *IEEE Visual Communications and Image Processing (VCIP) Conference*, Tainan City, Taiwan, November 2011.
74. J. Ishida, G. Cheung, A. Kubota, A. Ortega, "Sparse Representation of Depth Map using Penalty Function," *Picture Coding Symposium Japan*, Atami, Japan, October 2011. (**Best poster award**.)
73. Y. Feng, G. Cheung, Y. Ji, "Estimating Visual Attention using Inter-Frame Saliency Map Analysis for Gaze-based Video Streaming," *Picture Coding Symposium Japan*, Atami, Japan, October 2011.
72. G. Cheung, W.-s. Kim, A. Ortega, J. Ishida, A. Kubota, "Depth Map Coding using Graph Transform and Transform Domain Sparsification", *IEEE International Workshop on Multimedia Signal Processing*, Hangzhou, China, October 2011 (**Top 10% Paper Award**).
71. X. Xiu, G. Cheung, J. Liang, "Frame Structure Optimization for Interactive Multiview Video Streaming with Bounded Network Delay," in special session on "compression of high-dimensional media data for interactive navigation" *IEEE International Conference on Image Processing*, September 2011.
70. M. Shimano, G. Cheung, I. Sato, "Adaptive Frame and QP Selection for Temporally Super-resolved Full-exposure-time Video," *IEEE International Conference on Image Processing*, September 2011.
69. G. Cheung, J. Ishida, A. Kubota, A. Ortega, "Transform Domain Sparsification of Depth Maps using Iterative Quadratic Programming," *IEEE International Conference on Image Processing*, September 2011.
68. W.-t. Tan, G. Cheung, Y. Ma, "Face Recovery in Conference Video Streaming using Robust Principal Component Analysis," *IEEE International Conference on Image Processing*, September 2011 (**One of 5 Best Paper Finalists selected from 2245 submitted papers**).
67. Z. Liu, G. Cheung, Y. Ji, "Distributed Markov Decision Process in Cooperative Peer-to-peer Repair for WWAN Video Broadcast," *IEEE Workshop on Streaming and Media Communications* (in conjunction with ICME 2011), July 2011 (**Best Student Paper Award**).
66. V. Zhao, G. Cheung, "Game Theoretical Analysis of Wireless Multiview Video Multicast using Cooperative Peer-to-peer Repair," *IEEE Workshop on Streaming and Media Communications* (in conjunction with ICME 2011), July 2011.
65. V. Velisavljević, G. Cheung, J. Chakareski, "Bit Allocation for Multiview Image Compression using Cubic Synthesized View Distortion Model," *IEEE International Workshop on Hot Topics in 3D* (in conjunction with ICME 2011), July 2011.
64. X. Xiu, G. Cheung, A. Ortega, J. Liang, "Optimal Frame Structure for Interactive Multiview Video Streaming with View Synthesis Capability," *IEEE International Workshop on Hot Topics in 3D* (in conjunction with ICME 2011), July 2011.
63. Y. Feng, G. Cheung, W.-t. Tan, Y. Ji, "Hidden Markov Model for Eye Gaze Prediction in Networked Video Streaming," *IEEE International Conference on Multimedia and Expo*, July 2011. (selected as Top 15% Paper) (**One of 22 Best Paper Finalists selected from 744 submitted papers**).
62. W. Cai, G. Cheung, T. Kwon, S.-J. Lee, "Optimized Frame Structure for Interactive Light Field Streaming with Cooperative Cache," *IEEE International Conference on Multimedia and Expo*, July 2011. (acceptance rate: 30%)

61. V. Velisavljević, V. Stankovic, J. Chakareski, G. Cheung, "View and Rate Scalable Multiview Image Coding with Depth-image-based Rendering," invited paper to Special Session on "Multiview and 3D Video Coding" in *17th International Conference on Digital Signal Processing*, July 2011.
60. M. Shimano, G. Cheung, I. Sato, "Compression using Self-Similarity-based Temporal Super-resolution for Full-exposure-time Video," *IEEE International Conference on Acoustics, Speech and Signal Processing*, May 2011.
59. B. Zhang, G. Chan, G. Cheung, E. Chang, "LocalTree: An Efficient Algorithm for Mobile Peer-to-Peer Live Streaming," *IEEE International Conference on Communications*, Kyoto, Japan, June 2011.
58. Z. Liu, G. Cheung, Y. Ji, "Distributed Source Coding for WWAN Multiview Video Multicast with Cooperative Peer-to-peer Repair," *IEEE International Conference on Communications*, June 2011.
57. G. Cheung, A. Kubota, A. Ortega, "Sparse Representation of Depth Maps for Efficient Transform Coding," *IEEE Picture Coding Symposium*, December 2010.
56. V. Velisavljević, G. Cheung, J. Chakareski, "Optimal Rate Allocation for View Synthesis Along a Continuous Viewpoint Location in Multiview Imaging," *IEEE Picture Coding Symposium*, December 2010.
55. Z. Liu, G. Cheung, V. Velisavljević, E. Ekmekcioglu, Y. Ji, "Joint Source / Channel Coding for WWAN Multiview Video Multicast with Cooperative Peer-to-peer Repair," special session on "Advanced Interactive Multimedia Streaming" in *Packet Video Workshop*, December 2010.
54. G. Cheung, V. Velisavljević, "Bit Allocation and Encoded View Selection for Optimal Multiview Image Representation," *IEEE International Workshop on Multimedia Signal Processing*, October 2010.
53. N.-M. Cheung, A. Ortega, G. Cheung, "Rate-distortion based Reconstruction Optimization in Distributed Source Coding for Interactive Multiview Video Streaming," *IEEE International Conference on Image Processing*, October, 2010.
52. X. Liu, G. Cheung, C.-N. Chuah, "Deterministic Structured Network Coding for WWAN Video Broadcast with Cooperative Peer-to-peer Repair," *IEEE International Conference on Image Processing*, October, 2010.
51. G. Cheung, V. Velisavljević, "Efficient Bit Allocation for Multiview Image Coding and View Synthesis," *IEEE International Conference on Image Processing*, October 2010.
50. X. Liu, G. Cheung, C.-N. Chuah, "Deterministic Structured Network Coding for Video Multicast with Cooperative Peer-to-peer Repair," *IEEE International Conference on Image Processing*, October 2010.
49. G. Cheung, A. Ortega, N.-M. Cheung, B. Girod, "Structuring Media for Interactive Streaming in Immersive Applications," in special session on "Immersive Interaction for Networked Multiview Video Systems" in *SPIE International Conference on Visual Communications and Image Processing*, July 2010.
48. G. Cheung, W.-t. Tan, "Redundant Representation for Network Video Streaming using Reconstructed P-frames and SP-frames," *IEEE International Conference on Acoustics, Speech and Signal Processing*, March 2010.
47. X. Liu, G. Cheung, C.-N. Chuah, Y. Ji, "Bit Allocation of WWAN Scalable H.264 Video Multicast for Heterogeneous Cooperative Peer-to-peer Collective," special session on "Cooperative Media Communication" in *IEEE International Conference on Acoustics, Speech and Signal Processing*, March 2010.

46. G. Cheung, N.-M. Cheung, A. Ortega, "Optimized Frame Structure using Distributed Source Coding for Interactive Multiview Video Streaming," *IEEE International Conference on Image Processing*, November 2009.
45. X. Liu, G. Cheung, C.-N. Chuah, "Joint Source/Channel Coding of WWAN Multicast Video for a Cooperative Peer-to-Peer Collective using Structured Network Coding," *IEEE Workshop on Multimedia Signal Processing*, October 2009 (**Top 10% Award**).
44. G. Cheung, A. Ortega, N.-M. Cheung, "Bandwidth-Efficient Interactive Multiview Live Video Streaming using Redundant Frame Structures," *APSIPA Annual Summit and Conference*, October 2009.
43. N.-M. Cheung, A. Ortega, G. Cheung, "Distributed Source Coding Techniques for Interactive Multiview Video Streaming," *27th Picture Coding Symposium*, May 2009.
42. G. Cheung, A. Ortega, N.-M. Cheung, "Generation of Redundant Frame Structure for Interactive Multiview Streaming," *17th International Packet Video Workshop*, May 2009.
41. W.-t. Tan, B. Shen, A. Patti, G. Cheung, "Temporal Propagation Analysis for Small Errors in a Single-Frame in H.264 Video," *IEEE International Conference on Image Processing*, October, 2008.
40. G. Cheung, A. Ortega, T. Sakamoto, "Coding Structure Optimization for Interactive Multiview Streaming in Virtual World Observation," *IEEE International Workshop on Multimedia Signal Processing*, October 2008.
39. X. Liu, G. Cheung, C.-N. Chuah, "Structured Network Coding and Cooperative Local Peer-to-Peer for MBMS Video Streaming," *IEEE Workshop on Multimedia Signal Processing*, October 2008.
38. S. Raza, C.-N. Chuah, G. Cheung, "DiCoR: Distributed Cooperative Repair of Multimedia Broadcast Losses," *Fifth International Conference on Broadband Communications, Networks, and Systems*, September 2008.
37. X. Liu, G. Cheung, C.-N. Chuah, "Rate-distortion Optimized Network Coding for Cooperative Repair in Wireless Peer-to-Peer Networks," *IEEE Workshop on Mobile Video Delivery*, June 2008.
36. X. Liu, S. Raza, C.-N. Chuah, G. Cheung, "Network Coding Based Cooperative Peer-to-Peer Repair in Wireless Ad-Hoc Networks," *IEEE International Conference on Communications*, May 2008.
35. G. Cheung, A. Ortega, T. Sakamoto, "Fast H.264 Mode Selection Using Depth Information for Distributed Game Viewing," *IS&T/SPIE Visual Communications and Image Processing (VCIP)*, January 2008.
34. G. Cheung, W.-t. Tan, B. Shen, A. Ortega, "ECHO: A Community Video Streaming System with Interactive Visual Overlays," *IS&T/SPIE 15th Annual Multimedia Computing and Networking (MMCN'08)*, January 2008. (long paper acceptance rate: 26.3%)
33. G. Cheung, T. Sakamoto, "Construction and Scheduling of Extrapolated Parity Packets for Network Gaming," *ACM 6th Annual Workshop on Network and System Support for Games: Netgames 2007*, September 2007.
32. S. Raza, D. Li, C.-N. Chuah, G. Cheung, "Cooperative Peer-to-Peer Repair for Wireless Multimedia Broadcast," *IEEE International Conference on Multimedia and Expo*, July 2007.
31. G. Cheung, W.-t. Tan, "Low-latency Error Control of H.264 Using SP-Frames and Streaming Agent Over Wireless Networks," *IEEE International Conference on Communications*, June 2007.

30. W.-t. Tan, G. Cheung, "Using SP-Frames for Error Resilience in Optimized Video Streaming," *IEEE International Conference on Image Processing*, October 2006.
29. G. Cheung, T. Sakamoto, M. Sweeney, "Performance Enhancing Proxy for Interactive 3G Network Gaming," *Second International Symposium on Multimedia over Wireless*, July 2006.
28. G. Cheung, W.-t. Tan, "Packet Scheduling of Streaming Video with Flexible reference Frame using Dynamic Programming and Integer Rounding," *IEEE International Conference on Multimedia and Expo*, July 2006.
27. G. Cheung, P. Sharma, S.-J. Lee, "Implementation and Evolution of Packet Striping for Media Streaming over Multiple Burst-loss Channels," *IEEE International Conference on Multimedia and Expo*, July 2006.
26. D. Li, C.-N. Chuah, G. Cheung, S. J. Yoo, "Energy-Aware Multi-Source Video Streaming," *IEEE International Conference on Multimedia and Expo*, July 2006.
25. G. Cheung, T. Sakamoto, M. Sweeney, "Performance Enhancing Proxy for Interactive 3G Network Gaming," *Second International Symposium on Multimedia over Wireless*, July 2006.
24. W.-t. Tan, G. Cheung, "SP-Frame Selection for Video Streaming over Burst-loss Networks," *IEEE International Symposium on Multimedia*, December 2005.
23. G. Cheung, P. Sharma, S. J. Lee, "Striping Delay-sensitive Packets over Multiple Bursty Wireless Channels with Random Delays," *IEEE International Symposium on Multimedia*, December 2005.
22. G. Cheung, W.-t. Tan, "Loss-compensated Reference Frame Optimization for Multipath Video Streaming," *IEEE International Conference on Multimedia and Expo*, July 2005.
21. G. Cheung, P. Sharma, S. J. Lee, "Striping Delay-sensitive Packets over Multiple Bursty Wireless Channels," *IEEE International Conference on Multimedia and Expo*, July 2005.
20. G. Cheung, W.-t. Tan, "Reference Frame Optimization for Multi-path Video Streaming using Complexity Scaling," *IEEE Packet Video Workshop*, December 2004.
19. D. Li, C. N. Chuah, G. Cheung, S. J. Yoo, "Proxy-driven Rate-distortion Optimized Video Streaming over Wireless Network using Asynchronous Clocks," *IEEE Packet Video Workshop*, December 2004.
18. D. Li, G. Cheung, C. N. Chuah, S. J. Yoo, "Joint Server/Peer Receiver-Driven Rate-Distortion Optimized Video Streaming Using Asynchronous Clocks," *IEEE International Conference on Image Processing*, October 2004.
17. G. Cheung, T. Sakamoto, W.-t. Tan, "Graphics-to-video Encoding for 3G Mobile Game Viewer Multicast using Depth Values," *IEEE International Conference on Image Processing*, October 2004.
16. G. Cheung, C. N. Chuah, and D. Li, "Optimizing Video Streaming Against Transient Failures and Routing Instability," *IEEE International Conference on Communications*, June 2004. (acceptance rate: 29%)
15. G. Cheung, "Near-optimal Multipath Streaming of H.264 Using Reference Frame Selection," *IEEE International Conference on Image Processing*, September 2003.
14. J. Yeh, G. Cheung, "Complexity Scalable H.263 Video Transcoding," *IEEE International Conference on Image Processing*, September 2003.
13. G. Cheung, C. Chan, "Jointly Optimal Reference Frame & Quality of Service Selection for H.26L Video Coding over Lossy Networks," *IEEE International Conference on Multimedia and Expo*, July 2003.

12. G. Cheung, W.-t. Tan, T. Yoshimura, "Double Feedback Streaming Agent for Real-time Delivery of Media over 3G Wireless Networks," *IEEE Wireless Communications and Network Conference*, March 2003.
 11. G. Cheung, W.-t. Tan, T. Yoshimura, "Streaming Agent for Wired Network / Wireless Link Rate-Mismatch Environment," *IEEE International Workshop on Multimedia Signal Processing*, December 2002.
 10. G. Cheung, W.-t. Tan, T. Yoshimura, "Rate-distortion Optimized Application-level Retransmission using Streaming Agent for Video Streaming over 3G Wireless Network," *IEEE International Conference on Image Processing*, September 2002.
 9. G. Cheung, W.-t. Tan, "Directed Acyclic Graph based Source Modeling for Data Unit Selection of Streaming Media over QoS Networks," *IEEE International Conference Multimedia and Expo*, August 2002.
 8. G. Cheung, T. Yoshimura, "Streaming Agent: A Network Proxy for Media Streaming in 3G Wireless Networks," *IEEE International Packet Video Workshop*, May 2002.
 7. G. Cheung, "Directed Acyclic Graph based Mode Optimization for H.263 Video Encoding," *IEEE International Conference on Image Processing*, October 2001.
 6. G. Cheung, S. McCanne, "Dynamic Memory Model based Optimization of Scalar and Vector Quantizer for Fast Image Encoding," *IEEE International Conference on Image Processing*, September 2000.
 5. G. Cheung, S. McCanne, "Dynamic Memory Model Based Framework for Optimization of IP Address Algorithms," *IEEE International Conference Network Protocols*, October 1999. (acceptance rate: 27.5%)
 4. G. Cheung, S. McCanne, "An Attribute Grammar Based Framework for Machine-dependent Computational Optimization of Media Processing Algorithms," *IEEE International Conference on Image Processing*, October 1999.
 3. G. Cheung, S. McCanne, Christos Papadimitriou, "Software Synthesis of Variable-length Code Decoder using a Mixture of Programmed Logic and Table Lookups," *Data Compression Conference*, March 1999.
 2. G. Cheung, S. McCanne, "Optimal Routing Table Design for IP Address Lookups Under Memory Constraints," *IEEE INFOCOM*, March 1999 (acceptance rate: 30.7%) (citations: 101).
 1. G. Cheung, A. Zakhor, "Joint Source/Channel Coding of Scalable Video over Noisy Channels," *IEEE International Conference on Image Processing*, September 1996.
- Other Publications:**
3. C. Yang, Y. Mao, G. Cheung, V. Stankovic, K. Chan, "Non-intrusive Apnoea / Hypopnoea Detection System via a Graph-signal Analysis of Microsoft Kinect captured Depth Video," *22nd Congress of the European Sleep Research Society*, Tallinn, Estonia, September, 2014.
 2. G. Cheung, N.-M. Cheung, "High-dimensional Media Compression for Interactive Streaming," invited article in special issue on "Human-centric Multimedia Communications" in *IEEE MMTC E-Letter*, January 2011.
 1. G. Cheung, W.-t. Tan, "New Paradigms in Community Media: Transport and Interactivity," invited article in *IEEE MMTC E-Letter*, April 2009.

Invited Talks:

- “Interpretable Lightweight Transformer via Unrolling of Learned Graph Smoothness Priors,” invited talk in The University of Electro-Communications, Tokyo, Japan, July 2024.
- “Graph Signal Processing & Learning for Image Applications,” invited talk in Green IoT Workshop, Osaka, Japan, June 2024.
- “Efficient Signed Graph Sampling via Balancing and Gershgorin Disc Perfect Alignment,” invited talk in Tokyo University of Agriculture and Technology, Tokyo, Japan, July 2022.
- “Spectral Graph Learning: Algorithm and Application to Image Coding and Graph Convolutional Nets,” invited talk in University of Alberta, Edmonton, Canada, April 2022.
- “Spectral Graph Learning: Algorithm and Application to Image Coding and Graph Convolutional Nets,” invited talk in Tokyo University of Agriculture and Technology, Tokyo, Japan, February 2022.
- “Graph Learning, Sampling & Filtering for Image & Signal Estimation,” invited talk Simon Fraser University, Canada, March 2021.
- “Graph Learning, Sampling & Filtering for Image & Signal Estimation,” invited talk in Cisco Systems Inc., USA, March 2021.
- “Graph Learning, Sampling & Filtering for Image & Signal Estimation,” invited talk in University of Kentucky, USA, February 2021.
- “Graph Spectral Image Processing,” tutorial in IEEE ICIP (with Prof. Yuichi Tanaka), Abu Dhabi, United Arab Emirates, October 2020.
- “Graph Signal Analysis: Imaging, Learning, Sampling,” invited talk in Professional Engineers Ontario, Willowdale-Thornhill Chapter, Toronto, Canada, October 2019.
- “Graph Signal Analysis: Imaging, Learning, Sampling,” hosted by Prof. Zhou Wang in University of Waterloo, Waterloo, Canada, June 2019.
- “Fast Graph Sampling using Gershgorin Disc Alignment,” hosted by Prof. Yuji Nakatsukasa in Oxford University, Oxford, UK, May 2019.
- “Fast Graph Sampling using Gershgorin Disc Alignment,” hosted by Dr. Thomas Maugey in Inria, Rennes, France, April 2019.
- “Graph Signal Analysis: Imaging, Learning, Sampling,” hosted by Prof. Ashish Khisti in University of Toronto, Toronto, Canada, April 2019.
- “Graph Spectral Image Compression & Restoration,” invited keynote in PCSJ/IMPS 2018, Shizuoka-ken, Japan, November 2018.
- “Graph Spectral Image Processing,” hosted by Prof. Xiao-Ping Zhang in Ryerson University Toronto, Canada, November 2018.
- “Graph Spectral Image Processing,” hosted by Dr. Yuan Yuan in Shenzhen University, Shenzhen, China, September 2018.
- “Recent Advances in Graph Spectral Image Processing,” invited keynote in *Graph Signal Processing Workshop*, EPFL, Lausanne, Switzerland, June 2018.
- “Graph Signal Processing for Image Coding & Restoration,” hosted by Prof. Lu Fang in Tsinghua University Shenzhen Campus, Shenzhen, China, December 2017.
- “Semi-Supervised Graph Classifier Learning with Negative Edge Weights,” hosted by Prof. Wei Hu in Peking University, Beijing, China, November 2017.
- “Graph Signal Processing for Image Coding & Restoration,” and “Interactive Media Streaming Applications Using Merge Frames,” hosted by Prof. Chunyu Lin in Beijing Jiaotong University, Beijing, China, November 2017.

- “Semi-Supervised Graph Classifier Learning with Negative Edge Weights,” hosted by Prof. Yao Wang in NYU Polytechnic Institute, New York, USA, June 2017.
- “Graph Signal Processing for Image Compression & Restoration,” hosted by Prof. Chia-Wen Lin in National Tsing Hua University, Tsinchu, Taiwan, May 2017.
- “Semi-Supervised Graph Classifier Learning with Negative Edge Weights,” hosted by Prof. Enrico Magli in Politecnico di Torino, Torino, Italy, May 2017.
- “Inverse Imaging Problems using Graph-Signal Smoothness Priors,” hosted by Prof. Jiaying Liu in Peking University, Beijing, China, September 2016.
- “Inverse Imaging Problems using Graph-Signal Smoothness Priors”, hosted by Prof. Michael Ng in Hong Kong Baptist University, Hong Kong, August 2016.
- “Interactive Media Navigation using Merge Frames”, hosted by Dr. Dinei Florencio in Microsoft Research, Redmond, WA, USA, July 2016.
- “Graph Signal Processing for Image Compression and Restoration,” tutorial in IEEE ICME, Seattle, USA, July 2016.
- “Merge Frame Design for Interactive Media Streaming Applications,” hosted by Prof. Pascal Frossard in EPFL, Lausanne, Switzerland, March 2016.
- “Graph Signal Processing for Image Compression and Restoration,” tutorial in AP-SIPA ASC, Hong Kong, December 2015.
- “Depth Image Coding and Processing,” COST Training School, 3D-AVCom 2015, Lisbon, Portugal, July 2015.
- “Graph-based Depth Image Processing,” hosted by Dr. Ketan Tang in DJI, Shenzhen, China, May 2015.
- “Non-intrusive Apnoea / Hypopnoea Detection System via MS Kinect captured Depth Video Analysis,” hosted by Prof. Jie Liang in Simon Fraser University, November 2014.
- “3D Imaging: signal processing and applications,” hosted by Prof. Lu Fang in University of Science and Technology of China, September 2014.
- “Graph Laplacian Regularizer for Inverse Image Problems,” hosted by Prof. Antonio Ortega in University of Southern California, August 2014.
- “Graph Signal Processing for Image Compression & Restoration,” hosted by Prof. Ivan Bajic in Simon Fraser University, March 2014.
- “Graph Signal Processing for Image Compression & Restoration,” hosted by Prof. Vladimir Stankovic in University of Strathclyde, February 2014.
- “3D Visual Communication: Media Representation, Transport and Rendering,” plenary talk at *IEEE International Workshop on Multimedia Signal Processing*, October 2013.
- “Compact Representation of Dynamic 3D Scene for Immersive Visual Communication,” hosted by Dr. Giuseppe Valenzise in Telecom ParisTech, March 2013.
- “Compact Representation of Dynamic 3D Scene for Immersive Visual Communication,” hosted by Prof. Oscar Au in Hong Kong University of Science and Technology, February 2013.
- “Compact Representation of Dynamic 3D Scene for Immersive Visual Communication,” hosted by Prof. Lei Zhang in Hong Kong Polytechnic University, Dec 2012.
- “Eye-gaze Prediction via Joint-Analysis of Gaze Patterns and Visual Media,” hosted by Prof. Ivan Bajic in Simon Fraser University, Vancouver, Canada, March 2012.
- “Transform Domain Sparsification of Depth Maps for Depth-Image-Based Rendering,” hosted by Dr. Yasuyuki Matsushita in Microsoft Research Asia, Beijing, China, October 2011.

- “Sparse Representation of Depth Maps for Efficient Transform Coding,” hosted by Prof. Jie Liang in Simon Fraser University, Vancouver, Canada, February 2011.
- “Optimizing Multiview Image / Video Coding and Streaming,” hosted by Prof. Lei Zhang in Hong Kong Polytechnic University, December 2010.
- “Network Video Systems: Error-resilience & Interactivity,” hosted by Prof. Gary Chan in Hong Kong University of Science and Technology, December 2009.

Patent Applications:

- Peking University: 1 jointly filed.
- KDDI Laboratories: 1 jointly filed.
- Hong Kong University of Science and Technology: 1 jointly filed.
- National Institute of Informatics: 2 filed.
- Chuo University: 1 filed.
- Hewlett-Packard: 31 filed. 10 granted.
- Texas Instruments: 1 filed. 1 granted.

Society Activities:

- IEEE Senior Member since 2007. Fellow since 2021.
- Member in Challenges and Data Collections Committee in IEEE Signal Processing Society 2019-2023.
- TC Member in Image, Video, and Multidimensional Signal Processing Technical Committee (IVMSP-TC) in IEEE Signal Processing Society 2015-2017, 2018-2021.
- TC Member in Multimedia Signal Processing Technical Committee (MMSP-TC) in IEEE Signal Processing Society 2012-2014.
- IEEE Tokyo section Technical Program Committee Vice-Chair 2013-2014.
- Co-Chair of Interest Group “Visual Analysis, Management and Interaction for Communications” in IEEE Multimedia Communications Technical Committee (MMTC), 2012-2014.
- Board Member of membership board in IEEE Multimedia Communications Technical Committee (MMTC).
- Key Member of Interest Group on “Distributed and Sensor Networks for Mobile Media Computing and Applications” in IEEE Multimedia Communications Technical Committee (MMTC), 2010-2012.

Editorial Duties:

- Senior Associate Editor for IEEE Signal Processing Letters 08/2021-present.
- Associate Editor for IEEE Transactions on Image Processing 07/2015-12/2019.
- Associate Editor for IEEE Transactions on Circuits and Systems for Video Technology 01/2016-12/2017.
- Area Editor for EURASIP Signal Processing: Image Communication 12/2012-present.
- Associate Editor of APSIPA Transactions on Signal and Information Processing 11/2011-present.
- Associate Editor for SPIE Journal of Electronic Imaging 06/2014-01/2016.
- Associate Editor for DSP Applications Column in IEEE Signal Processing Magazine 12/2010-12/2014.
- Associate Editor of IEEE Transactions on Multimedia 12/2007-08/2011.
- Lead Guest Editor for Special Issue on “Interactive Media Processing for Immersive Communication” in IEEE Journal of Selected Topics in Signal Processing, March 2015.

- Guest Editor for Special Issue on “Interactive 3D Video Streaming” in IEEE Communications Magazine, May 2013.
- Guest Editor for Special Issue on “Advances in 3D Video Processing” in Journal of Visual Communication and Image Representation.
- Review board member for R-Letter in IEEE Multimedia Communications Technical Committee (MMTC), 2012-2014.

**Conference
Organization**

- Special sessions chair for IEEE 26th International Workshop on Multimedia and Signal Processing (MMSP) 2025.
- Publicity chair for IEEE International Conference on Multimedia and Expo (ICME) 2024.
- Tutorial chair for IEEE International Conference on Image Processing (ICIP) 2022.
- Finance chair for IEEE Data Science and Learning Workshop (DSLW) 2022.
- Co-organizer for workshop on “Graph Signal Processing meets Computer Vision” in IEEE International Conference on Computer Vision (ICCV) 2021.
- Lead technical program chair for IEEE 23rd International Workshop on Multimedia and Signal Processing (MMSP) 2021.
- Finance chair for IEEE Data Science and Learning Workshop (DSLW) 2021.
- Social media chair for IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2021.
- Technical program chair for IEEE 22nd International Workshop on Multimedia and Signal Processing (MMSP) 2020.
- Special session chair for IEEE International Conference on Multimedia and Expo (ICME) 2020.
- Grand challenge chair for IEEE International Conference on Multimedia and Expo (ICME) 2019.
- Technical program chair for IEEE International Conference on Visual Communications and Image Processing (VCIP) 2018.
- Special sessions and panel chair for IEEE 19th International Workshop on Multimedia and Signal Processing (MMSP) 2017.
- Special session chair for IEEE International Conference on Multimedia and Expo (ICME) 2017.
- Area chair for IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2017–2021.
- Co-organizer of special session on “Graph-based Multi-dimensional Image Data Compression” in IEEE ICIP 2016.
- Panel chair and area chair for IEEE International Conference on Multimedia and Expo (ICME) 2016.
- Technical program chair for IEEE International Workshop on Multimedia Signal Processing (MMSP) 2015.
- Co-organizer of special session on “3D Imaging for Health Monitoring and Interventions” in IEEE ICME 2015.
- Tutorial chair and area chair for IEEE International Conference on Multimedia and Expo (ICME) 2015.
- Area chair for IEEE International Conference on Multimedia and Expo (ICME) 2014.

- Plenary speaker on “3D visual communication: media representation, transport and rendering” for IEEE MMSP 2013.
- Asia and Australia Liaison for IEEE International Workshop on Multimedia Signal Processing (MMSP) 2013.
- TPC area chair for IEEE International Conference on Multimedia and Expo (ICME) 2013.
- Area Chair for IEEE International Conference on Image Processing (ICIP) 2010, 2012, 2013, 2015–2021.
- Co-organizer for special session on “3D Visual Representation and Coding” for AP-SIPA ASC 2013.
- Co-organizer for special session on “Depth map processing for 3D applications” for IEEE IVMSWP Workshop 2013.
- Publication Co-chair for IEEE Visual Communications and Image Processing (VCIP) 2012.
- Symposium Co-chair for Communication Software, Services and Multimedia Applications (CSSMA) Symposium in IEEE Global Communications Conference (GLOBECOM) 2012.
- Co-organizer for special session on “Streaming of 3D Content” for 19th International Packet Video Workshop, 2012.
- Co-organizer for 3rd International Workshop on Hot Topics in 3D (Hot3D’12), in conjunction with ICME 2012.
- Track Co-chair for “multimedia signal processing” track in IEEE International Conference on Multimedia and Expo (ICME) 2011.
- Co-organizer for special session on “compression of high-dimensional media data for interactive navigation” for IEEE International Conference on Image Processing (ICIP) 2011.
- Technical Program Co-Chair of 18th International Packet Video Workshop (PV) 2010.
- SPIE International Conference on Visual Communications and Image Processing (VCIP) award committee 2010.
- Demo Co-Chair of IEEE Consumer Communications & Networking Conference (CCNC) 2010.
- Co-Chair for Special Session on “Immersive Interaction for Networked Multiview Video Systems” for SPIE International Conference on Visual Communications and Image Processing (VCIP) 2010.
- Co-Chair for Special Session on “Cooperative Media Communication” for IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2010.
- Technical Program Committee Member: International Conference on Communications, Circuits and Systems (ICCCAS) 2004-2005, 2008-2009, IEEE International Conference on Image Processing (ICIP) 2005, IEEE Globecom 2006-2007, 2013-2015, IEEE International Conference on Multimedia and Expo (ICME) 2005-2006, 2010-2012, IEEE Consumer Communications and Networking Conference (CCNC) 2007, IEEE International MultiMedia Modeling Conference (MMM) 2008-2009, 2012-2015, 2017, DTV Workshop of ICC 2008, IEEE Workshop on Multimedia Signal Processing (MMSP) 2010-2011, IEEE International Workshop on Hot Topics in 3D (Hot3D) 2010-2011, 2013-2015, IEEE International Conference on Computer Communication Network (ICCCN) 2011, IEEE Workshop on Streaming and Media Communications (StreamComm) 2011, IEEE International Conference on Emerging Signal Processing

Applications (ESPA) 2012, 6th International Conference on Multimedia and Ubiquitous Engineering (MUE) 2012, 19th International Packet Video Workshop (PV) 2012-2013, 2015, 20th European Signal Processing Conference (EUSIPCO) 2012-2014, Pacific-Rim Conference on Multimedia (PCM) 2012-2013, International Conference on Internet Multimedia Computing and Service (ICIMCS) 2012, European Workshop on Visual Information Processing (EUVIP) 2013, International Conference on 3D Imaging (IC3D) 2013, 3DTV-Con 2014-2015, Picture Coding Symposium (PCS) 2015, IEEE International Conference on Signal Processing (ICSP) 2016, IEEE IVMSWP Workshop 2016.

- Technical Referee: IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Wireless Communications, IEEE Signal Processing Letters, IEEE Communications Letters, Journal of Visual Communication and Image Representation (JVCI), EURASIP Journal on Applied Signal Processing (JASP), EURASIP Signal Processing: Image Communication.

Funding:

- Lasonde Innovation Fund (LIF) in York University (2024): 25,000 CAD.
- JSPS short-term (two-month) fellowship (2024).
- Google Research (2022): 10,000 USD.
- SOSICIP Consortium advanced computing platform (2021-2022).
- NSERC Alliance Grant “Distributed Graph-based Semi-supervised Classifiers: Sampling and Interpolation” (2020-2023): 96,500 CAD.
- Cisco (2019-2020): 75,000 USD.
- InterDigital (2019-2020): 50,000 USD.
- NSERC Discovery Grant “Graph Spectral Imaging: Sampling, Representation and Restoration” (2019-2023): 39,000 CAD per year for 5 years.
- NSERC Discovery Accelerator Supplement Award (2019-2021): 40,000 CAD per year for 3 years.
- Kandao Technology (2018-2019): 25,000 USD.
- JSPS Scientific Research C (2018-2020): 3.6 million yen (43,640 CAD).
- NTT (2017-2019): 2 million yen per year (24,250 CAD).
- Sisvel Technology Research (2016-2017): 20,000 Euro (29,220 CAD).
- MSR CORE12 (2016-2017): 2.5 million yen (30,310 CAD), plus 1 million yen extension (12,120 CAD).
- JSPS Grant-in-Aid for Challenging Exploratory Research (2015-2017): 3.6 million yen (43,640 CAD).
- KDDI Research (2013-2014): 1.0 million yen (12,120 CAD).
- Samsung Research Yokohama: 1.0 million yen (2013-2014) (12,120 CAD), 2.0 million yen (2014-2015) (24,240 CAD).
- MSR CORE9 (2013-2014): 2.0 million yen (24,240 CAD), plus 1.5 million yen extension (18,180 CAD).
- MSR CORE7 (2011-2012): 1.5 million yen (18,180 CAD).
- JSPS Grant-in-Aid for Young Scientists (B) (2011-2014): 4.7 million yen (57,000 CAD).
- FP7-PEOPLE-2011-IRSES (2011-2014).

Consulting:

October 2021 - Present

- As scientific advisory board member in Growers Edge, advise engineers on graph-based prediction of crop yields to aid US farmers in the face of climate change.

Student Advising:

September 2021 - Present

- Supervising post-doc Chinthaka Dinesh on graph signal sampling and processing.

September 2022 - Present

- Supervising one PhD student, Saghar Baghri, on graph signal processing for crop yield prediction.
- Supervising three master's students, Tam Thuc Do, Yeganeh Gharedaghi and Niruhan Viswarupan in York University on graph and image signal processing.

September 2018 - July 2022

- Supervising four master's students, Saghar Bagheri, Fengbo Lan, Huy Vu and Tam Thuc Do in York University on graph and image signal processing.
- Supervising post-doc Xue Zhang on interactive 360 video coding & streaming and graph spectral 3D point cloud processing.

September 2018 - July 2020

- Supervised post-doc Cheng Yang on graph signal processing for health care applications and graph metric learning.

Nov 2015 - July 2018

- Supervised one PhD student, Takayuki Yagi in National Institute of Informatics on 3D image based health diagnosis.

1. Takayuki Yagi (2018), physical therapist, Uno Hospital, Japan

Nov 2015 - July 2018

- Supervised two post-docs in National Institute of Informatics on image and graph signal processing.

1. Xianming Liu (2014–2017), professor, Harbin Institute of Technology, China.
2. Cheng Yang (2017–2018), post-doc, York University, Canada.

January 2015 - January 2018

- Co-supervised six PhD students in Hong Kong University of Science and Technology on image and graph signal processing.

1. Wei Hu (2015), assistant professor, Peking University, China.
2. Wei Dai (2015), research engineer, Agora, China.
3. Pengfei Wan (2015), research manager, Meitu, China.
4. Jiahao Pang (2016), research engineer, SenseTime, Hong Kong.
5. Amin Zheng (2017), research engineer, Meitu, China.
6. Jin Zeng (2018), assistant professor, Tongji University, China.

Nov 2010 - May 2016

- Co-supervising three Sokendai graduate students with Professor Yusheng Ji in National Institute of Informatics on image/video streaming & processing.

1. Zhi Liu (2014), associate professor, The University of Electro-Communications
2. Yunlong Feng (2014), engineer, Baidu, China
3. Yu Mao (2016), researcher, Rakuten Research, Japan

Dec 2002 - May 2010

- Co-advised three graduate students with Professor Chen-Nee Chuah of University of California, Davis, on the topic of wireless network support for media streaming.

May 2002 - October 2003

- Advised a graduate student in University of California, Berkeley, on complexity scaling of video transcoding.

May 2002 - Dec 2002

- Tutored an undergraduate intern in HP Labs Japan in the multi-path streaming project.
- Co-authored a conference paper on the same topic.

Teaching (eecs3451) Signals and Systems Fall 2020, Winter 2022

Experience: • Fundamentals of signal processing theories. Topics covered include frequency analysis of continuous and discrete signals, sampling theorems, fast Fourier transform, analysis of linear time-invariant (LT) systems.

(eecs6354) Digital Image Processing: Theory and Algorithms Winter 2020, Winter 2022, Fall 2023

• Fundamental image processing theories and algorithms. Signal representation using transforms, wavelets and frames. Signal reconstruction methods using total variation, sparse coding and low-rank prior, based on convex optimization. Applications include image compression, restoration and enhancement.

(eecs3602) Systems and Random Processes in Discrete Time Fall 2019, Fall 2020

• Probability theory and stochastic processes, including counting methods, discrete / continuous random variables, limit theorems, Poisson process, Gaussian process, Markov chains, Renewal process.

(eecs4452) Digital Signal Processing: Theory and Applications Winter 2019

• Inner product, Hilbert space, linear time-invariant systems, discrete-time Fourier transform, z -transform, discrete Fourier transform, multi-rate systems, sampling, interpolation.

English Presentation I & II 2015, 2016, 2017

• English presentation techniques, elevator pitch.

Applications of Multimedia Processing 2011, 2013, 2016, 2018

• Image compression, interactive streaming, image rendering.

Introduction to Multimedia Information Science 2010 to present

• Overview a broad range of topics on multimedia information science.

Teaching Assistant Spring 1997

- Led discussion sessions for an undergraduate level DSP lab class (EE20).
- Coordinated and helped design DSP lab sessions.

Computer Skills: • Language Proficiency: C, C++, Matlab, HTML, CSS, Tcl/Tk, Java, x86 Assembly, TMS320c50

Language Skills: • Fluency in Cantonese, reading and writing proficiency in Chinese.
• Competence in Japanese speaking, reading and writing (Japanese-Language Proficiency Test level 1).

Citizenship: • Canadian

References: Professor Antonio Ortega
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