

Cheng-Hsin Hsu

CONTACT INFORMATION

Department of Computer Science
National Tsing Hua University
No. 101, Section 2, Kuang-Fu Road
Hsin Chu, Taiwan

Office: +886-3-5731216
Mobile: +886-981-327063
Fax: +886-3-5723694
Mail: chsu@cs.nthu.edu.tw

RESEARCH INTERESTS

Multimedia networking, immersive video, Internet-of-Things (IoT), smart-space, distributed systems, networked games, cloud/fog computing, mobile computing, broadcast/wireless networks, and computer networks

EXPERIENCE

National Tsing Hua University, Hsin Chu, Taiwan

<i>Professor</i>	August 2021 to Present
<i>Associate Professor</i>	August 2014 to July 2021
<i>Assistant Professor</i>	August 2011 to July 2014

University of California, Irvine, California, USA

<i>Lecturer</i>	January 2019 to March 2019
<i>Research Scholar / Visiting Associate Researcher</i>	August 2018 to June 2019
<i>Visiting Assistant Researcher</i>	July 2013 to September 2013

University of Illinois, Urbana-Champaign, Illinois, USA

<i>Visiting Scholar</i>	January 2016 to February 2016
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Qatar Computing Research Institute, Doha, Qatar

<i>Visiting Research Consultant</i>	July 2014 to August 2014
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Deutsche Telekom, Inc., R&D Lab USA, Los Altos, California, USA

<i>Senior Research Scientist</i>	December 2009 to July 2011
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Simon Fraser University, Burnaby, British Columbia, Canada

<i>Research Assistant</i>	Spring 2006 to November 2009
<i>Teaching Assistant</i>	Fall 2005 to Spring 2006
<i>MITACS Intern</i>	Spring 2007

Motorola Inc., Champaign, Illinois, USA

<i>Senior Network Engineer</i>	January 2005 to July 2005
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Lucent Technologies, Landover, Maryland, USA

<i>Member of Technical Staff</i>	April 2001 to January 2005
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EDUCATION

Simon Fraser University, Surrey, British Columbia, Canada

Ph.D, School of Computing Science, November 2009

- Advisor: Prof. Mohamed Hefeeda
- Thesis: *Efficient Mobile Multimedia Streaming*

University of Maryland, College Park, Maryland, USA

M.Eng., Department of Electrical and Computer Engineering, August 2003

National Chung Cheng University, Chia Yi, Taiwan

M.S., Department of Computer Science and Information Engineering, August 2000

- Advisor: Prof. Daniel J. Buehrer
- Thesis: Making Java Applications Run Remotely

B.S., Department of Mathematics, June 1996

JOURNAL AND
MAGAZINE
ARTICLES

- [1] C. Hsu, Y. Li, C. Tsai, J. Wang, and C. Hsu, “Federated learning using multi-modal sensors with heterogeneous privacy sensitivity levels,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, July 2024, Accepted to Appear.
- [2] K. Lee, A. Singla, P. Cesar, and C. Hsu, “Adaptive cloud VR gaming optimized by gamer QoE models,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, July 2024, Accepted to Appear.
- [3] C. Wu, C. Hsu, T. Hung, C. Griwodz, W. Ooi, and C. Hsu, “Quantitative comparison of point cloud compression algorithms with PCC Arena,” *IEEE Transactions on Multimedia*, vol. 25, pp. 3073–3088, 2023.
- [4] C. Hsu, T. Hung, and C. Hsu, “Optimizing immersive video coding configurations using deep learning: A case study on TMIV,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 18, no. 1, pp. 19:1–19:25, January 2022.
- [5] C. Fan, T. Hung, and C. Hsu, “Modeling the user experience of watching 360° videos with head-mounted displays,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 18, no. 1, pp. 3:1–3:23, January 2022.
- [6] P. Venkateswaran, K. Benson, C. Hsieh, C. Hsu, S. Mehrotra, and N. Venkatasubramanian, “REAM: A framework for resource efficient adaptive monitoring of community spaces,” *Elsevier Pervasive and Mobile Computing*, vol. 76, pp. 101459:1–101459:19, September 2021.
- [7] M. Tsai, N. Venkatasubramanian, and C. Hsu, “Multi-level feature driven storage management of surveillance videos,” *Elsevier Pervasive and Mobile Computing*, June 2021, vol. 76, pp. 101441:1–101441:21, September 2021.
- [8] C. Huang, Y. Cheng, G. Huang, C. Fan, and C. Hsu, “On the performance comparisons of native and clientless real-time screen sharing technologies,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 17, no. 2, pp. 54:1–54:26, June 2021.
- [9] C. Fan, S. Yen, C. Huang, and C. Hsu, “On the optimal encoding ladder of tiled 360° videos for head-mounted virtual reality,” *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 31, no. 4, pp. 1632–1647, April 2021.
- [10] C. Fan, S. Yen, C. Huang, and C. Hsu, “Optimizing fixation prediction using recurrent neural networks for 360° video streaming in head-mounted virtual reality,” *IEEE Transactions on Multimedia*, vol. 22, no. 3, pp. 744–759, March 2020.

- [11] C. Fan, W. Lo, Y. Pai, and C. Hsu, "A survey on 360° video streaming: acquisition, transmission, and display," *ACM Computing Surveys*, vol. 52, no. 4, pp. 71:1–71:36, September 2019.
- [12] M. Rahman, A. Rahman, H. Hong, L. Pan, M. Uddin, N. Venkatasubramanian, and C. Hsu, "An adaptive IoT platform on budgeted 3G data plans," *Elsevier Journal of Systems Architecture*, vol. 97, pp. 65–76, August 2019.
- [13] I. Ali, R. Chang, and C. Hsu, "SOQAS: Distributively finding high-quality answers in dynamic social networks," *IEEE Access*, vol. 6, pp. 55074–55089, September 2018.
- [14] M. Abdallah, C. Griwodz, K. Chen, G. Simon, P. Wang, and C. Hsu, "Delay-sensitive video computing in the cloud: A survey," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 14, no. 3s, pp. 54:1–54:29, August 2018.
- [15] H. Hong, T. El-Ganainy, C. Hsu, K. Harras, and M. Hefeeda, "Disseminating multi-layer multimedia content over challenged networks," *IEEE Transactions on Multimedia*, vol. 20, no. 2, pp. 345–360, February 2018.
- [16] N. Do, Y. Zhao, C. Hsu, and N. Venkatasubramanian, "Crowdsourced mobile data transfer with delay bound," *ACM Transactions on Internet Technology*, vol. 16, no. 4, pp. 28:1–28:29, December 2016.
- [17] C. Hsu, C. Fan, T. Tsai, C. Huang, C. Hsu, and K. Chen, "Toward an adaptive screencast platform: Measurement and optimization," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 12, no. 5s, pp. 79:1–79:23, December 2016.
- [18] W. Cai, R. Shea, C. Huang, K. Chen, J. Liu, V. Leung, and C. Hsu, "A survey on cloud gaming: Future of computer games," *IEEE Access*, vol. 4, pp. 7605–7620, August 2016.
- [19] H. Hong, C. Fan, Y. Lin, and C. Hsu, "Optimizing cloud-based video crowdsensing," *IEEE Internet of Things Journal*, vol. 3, no. 3, pp. 299–313, June 2016.
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- [21] Y. Wang, X. Liu, and C. Hsu, "UPDATE: User-Profile-Driven Adaptive TransfER for mobile devices," *ACM Transactions on Embedded Computing Systems*, vol. 15, no. 3, pp. 42:1–42:26, March 2016.
- [22] S. Almowuena, M. Rahman, C. Hsu, A. Hassan, and M. Hefeeda, "Energy-aware and bandwidth-efficient hybrid video streaming over mobile networks," *IEEE Transactions on Multimedia*, vol. 18, no. 1, pp. 102–115, January 2016.
- [23] H. Hong, C. Hsu, T. Tsai, C. Huang, K. Chen, and C. Hsu, "Enabling adaptive cloud gaming in an open-source cloud gaming platform," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 25, no. 12, pp. 2078–2091, December 2015.
- [24] Y. Li, C. Trang, S. Wang, X. Huang, C. Hsu, and P. Lin, "A resource-constrained asymmetric redundancy elimination algorithm," *IEEE/ACM Transactions on Networking*, vol. 23, no. 4, pp. 1135–1148, August 2015.
- [25] S. Shu and C. Hsu, "A survey of interactive remote rendering systems," *ACM Computing Surveys*, vol. 47, no. 4, pp. 57:1–57:29, June 2015.

- [26] H. Hong, D. Chen, C. Huang, K. Chen, and C. Hsu, "Placing virtual machines to optimize cloud gaming experience," *IEEE Transactions on Cloud Computing*, vol. 3, no. 1, pp. 42–53, January 2015.
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- [28] D. Mishra, M. El Zarki, A. Erbad, C. Hsu, and N. Venkatasubramanian, "Clouds + games: a multifaceted approach," *IEEE Internet Computing*, vol. 18, no. 3, pp. 20–27, March 2014.
- [29] K. Chen, Y. Chang, H. Hsu, D. Chen, C. Huang, and C. Hsu, "On the quality of service of cloud gaming systems," *IEEE Transactions on Multimedia*, vol. 16, no. 2, pp. 480–495, February 2014.
- [30] N. Do, C. Hsu, and N. Venkatasubramanian, "Video dissemination over hybrid cellular and ad hoc networks," *IEEE Transactions on Mobile Computing*, vol. 13, no. 2, pp. 274–286, February 2014.
- [31] C. Huang, K. Chen, D. Chen, H. Hsu, and C. Hsu, "GamingAnywhere: The first open source cloud gaming system," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 10, no. 1s, pp. 10:1–10:25, January 2014.
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- [33] Y. Wang, T. Lin, C. Hsu, and X. Liu, "Region- and action-aware virtual world clients," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 9, no. 1, pp. 6:1–6:21, February 2013.
- [34] M. Hefeeda and C. Hsu, "Design and evaluation of a testbed for mobile TV networks," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 8, no. 1, pp. 3:1–3:25, January 2012.
- [35] C. Ly, C. Hsu, and M. Hefeeda, "IRS: A detour routing system to improve quality of online games," *IEEE Transactions on Multimedia*, vol. 13, no. 4, pp. 733–747, August 2011.
- [36] Y. Shen, C. Hsu, and M. Hefeeda, "Efficient algorithms for multi-sender data transmission in swarm-based peer-to-peer streaming systems," *IEEE Transactions on Multimedia*, vol. 13, no. 4, pp. 762–775, August 2011.
- [37] C. Hsu and M. Hefeeda, "Flexible broadcasting of scalable video streams to heterogeneous mobile devices," *IEEE Transactions on Mobile Computing*, vol. 10, no. 3, pp. 406–418, March 2011.
- [38] M. Hefeeda, C. Hsu, and K. Mokhtarian, "Design and evaluation of a proxy cache for peer to peer traffic," *IEEE Transactions on Computers*, vol. 60, no. 7, pp. 964–977, March 2011.
- [39] C. Hsu and M. Hefeeda, "Statistical multiplexing of variable-bit-rate videos streamed to mobile devices," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 7, no. 2, pp. 12:1–12:23, February 2011.
- [40] C. Hsu and M. Hefeeda, "Using simulcast to control channel switching delay in mobile TV broadcast networks," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 7, no. 2, pp. 8:1–8:29, February 2011.

- [41] C. Hsu and M. Hefeeda, “A framework for cross-layer optimization of video streaming in wireless networks,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 7, no. 1, pp. 5:1–5:28, January 2011.
- [42] C. Hsu and M. Hefeeda, “Broadcasting video streams encoded with arbitrary bit rates in energy-constrained mobile TV networks,” *IEEE/ACM Transactions on Networking*, vol. 18, no. 3, pp. 681–694, June 2010.
- [43] M. Hefeeda and C. Hsu, “On burst transmission scheduling in mobile TV broadcast networks,” *IEEE/ACM Transactions on Networking*, vol. 18, no. 2, pp. 610–623, April 2010.
- [44] C. Hsu and M. Hefeeda, “On the accuracy and complexity of rate-distortion models for FGS-encoded video sequences,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 4, no. 2, pp. 15:1–15:22, May 2008.
- [45] C. Hsu and M. Hefeeda, “Partitioning of multiple fine-grained scalable video sequences concurrently streamed to heterogeneous clients,” *IEEE Transactions on Multimedia*, vol. 10, no. 3, pp. 457–469, April 2008.
- [46] M. Hefeeda and C. Hsu, “Rate-distortion optimized streaming of fine-grained scalable video sequences,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 4, no. 1, pp. 2:1–2:28, January 2008.
- [47] C. Hsu and M. Hefeeda, “Optimal coding of multi-layer and multi-version video streams,” *IEEE Transactions on Multimedia*, vol. 10, no. 1, pp. 121–131, January 2008.

CONFERENCE AND
WORKSHOP
PAPERS

- [1] H. Chiang, G. Li, F. Wang, S. Shirmohammadi, and C. Hsu, “Enhancing skeletal pose estimation from mmWave point clouds through uncertainty reduction,” in *Proc. of ACM International Workshop on Human-Centric Multimedia Analysis (HCMA’24)*, Melbourne, Australia, October 2024.
- [2] R. Rahman, C. Lin, C. Hsu, and N. Venkatasubramanian, “A measurement-informed approach to modeling underground IoT communications,” in *Proc. of IEEE Vehicular Technology Conference (VTC’24-Fall)*, Washington, DC, October 2024.
- [3] M. Zhu, Y. Sun, N. Li, J. Zhou, S. Chen, C. Hsu, and Y. Liu, “Dynamic 6-DoF volumetric video generation: Software toolkit and dataset,” in *Proc. of IEEE International Workshop on Multimedia Signal Processing (MMSP’24)*, West Lafayette, IN, October 2024.
- [4] Y. Wei, Y. Sun, S. Zheng, H. Hsu, C. Huang, and C. Hsu, “Mitigating privacy threats without degrading visual quality of VR applications: Using re-identification attack as a case study,” in *Proc. of IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR’24)*, San Jose, CA, August 2024.
- [5] Y. Sun, Y. Shi, W. Ooi, C. Huang, and C. Hsu, “Multi-frame bitrate allocation of dynamic 3D Gaussian splatting streaming over dynamic networks,” in *Proc. of ACM SIGCOMM Workshop on Emerging Multimedia Systems (EMS’24)*, Sydney, Australia, August 2024, **Best Paper Award**.

- [6] Y. Li, F. Liu, C. Hsu, and N. Venkatasubramanian, “AMPHI: Adaptive mission-aware microservices provisioning in heterogeneous IoT settings,” in *Proc. of IEEE International Conference on Smart Computing (SMARTCOMP’24)*, Osaka, Japan, June 2024.
- [7] G. Li, H. Chiang, Y. Li, S. Shirmohammadi, and C. Hsu, “A driver activity dataset with multiple RGB-D cameras and mmWave radars,” in *Proc. of ACM SIGMM Conference on Multimedia Systems (MMSys’24)*, Bari, Italy, April 2024, Dataset Paper, pp. 360–366.
- [8] G. Shi, C. Wu, and C. Hsu, “Error concealment of dynamic LiDAR point clouds for connected and autonomous vehicles,” in *Proc. of IEEE Global Communications Conference (GLOBECOM’23)*, Kuala Lumpur, Malaysia, December 2023, pp. 5409–5415.
- [9] C. Wu, R. Rahman, C. Hsu, C. Lai, N. Venkatasubramanian, and C. Hsu, “Evaluating subsurface single-hop WiFi and LoRa networks for internet of underground things,” in *Proc. of IEEE International Workshop on Unconventional IoT Applications (Un-IoT’23)*, Kuala Lumpur, Malaysia, December 2023, pp. 702–707.
- [10] S. Tang, Y. Sun, and C. Hsu, “A blind streaming system for multi-client online 6-DoF view touring,” in *Proc. of ACM International Conference on Multimedia (Multimedia’23)*, Ottawa, Canada, October 2023, pp. 9124–9133.
- [11] H. Chiang, Y. Wu, S. Shirmohammadi, and C. Hsu, “Memory-efficient high-accuracy food intake activity recognition with 3D mmWave radar,” in *Proc. of ACM International Workshop on Multimedia Assisted Dietary Management (MADiMa’23)*, Ottawa, Canada, October 2023, pp. 33–41, **Best Paper Award**.
- [12] K. Lee, J. Fang, Y. Sun, and C. Hsu, “Modeling gamer quality-of-experience using a real cloud VR gaming testbed,” in *Proc. of ACM International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE’23)*, Vancouver, Canada, June 2023, pp. 12–17.
- [13] J. Fang, K. Lee, T. Kamarainen, M. Siekkinen, and C. Hsu, “Will dynamic foveation boost cloud VR gaming experience?” in *Proc. of ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV’23)*, Vancouver, Canada, June 2023, pp. 29–35.
- [14] Y. Sun, I. Huang, Y. Shi, W. Ooi, C. Huang, and C. Hsu, “A dynamic 3D point cloud dataset for immersive applications,” in *Proc. of ACM SIGMM Conference on Multimedia Systems (MMSys’23)*, Vancouver, Canada, June 2023, Dataset Paper, pp. 376–383.
- [15] Y. Wu, H. Chiang, S. Shirmohammadi, and C. Hsu, “A dataset of food intake activities using sensors with heterogeneous privacy sensitivity levels,” in *Proc. of ACM SIGMM Conference on Multimedia Systems (MMSys’23)*, Vancouver, Canada, June 2023, Dataset Paper, pp. 416–422.
- [16] Y. Wei, X. Wei, X. Zheng, C. Hsu, and C. Yang, “A 6DoF VR dataset of 3D virtual world for privacy-preserving approach and utility-privacy tradeoff,” in *Proc. of ACM SIGMM Conference on Multimedia Systems (MMSys’23)*, Vancouver, Canada, June 2023, Dataset Paper, pp. 444–450.
- [17] C. Hsieh, P. Venkateswaran, N. Venkatasubramanian, and C. Hsu, “T2C: A Multi-User System for Deploying DNNs in a Thing-to-Cloud Continuum,” in *Proc. of IEEE International Conference on Mobility, Sensing and Networking (MSN’22)*, Guangzhou, China, December 2022, Invited Paper, pp. 255–262.

- [18] T. Hung, I. Huang, S. Cox, W. Ooi, and C. Hsu, “Error concealment of dynamic 3D point cloud streaming,” in *Proc. of ACM International Conference on Multimedia (Multimedia’22)*, Lisbon, Portugal, October 2022, pp. 3134–3142.
- [19] Y. Chen, C. Hsu, C. Tsai, and C. Hsu, “HPFL: Federated learning by fusing multiple sensor modalities with heterogeneous privacy sensitivity levels,” in *Proc. of ACM International Workshop on Methodologies and Tools for Multimedia (Meet4MM’22)*, Lisbon, Portugal, October 2022, pp. 5–14.
- [20] S. Tang, Y. Sun, J. Fang, K. Lee, C. Wang, and C. Hsu, “Optimal camera placement for 6 degree-of-freedom immersive video streaming without accessing 3D scenes,” in *Proc. of ACM International Workshop on Interactive Extended Reality (IXR’22)*, Lisbon, Portugal, October 2022, pp. 31–39.
- [21] Y. Wu, Y. Chen, S. Shirmohammadi, and C. Hsu, “AI-assisted food intake activity recognition using 3D mmWave radars,” in *Proc. of ACM International Workshop on Multimedia Assisted Dietary Management (MADiMa’22)*, Lisbon, Portugal, October 2022, pp. 81–89.
- [22] Y. Sun, S. Tang, C. Wang, and C. Hsu, “On objective and subjective quality of 6DoF synthesized live immersive videos,” in *Proc. of ACM International Workshop on Quality of Experience in Visual Multimedia Applications (QoEVMA’22)*, Lisbon, Portugal, October 2022, pp. 49–56.
- [23] T. Fan, J. Fang, F. Liu, N. Venkatasubramanian, and C. Hsu, “Enhancing situational awareness with adaptive firefighting drones: Leveraging diverse media types and classifiers,” in *Proc. of ACM SIGMM Conference on Multimedia Systems (MMSys’22)*, Athlone, Ireland, June 2022, pp. 279–286.
- [24] T. Fan, T. Tsai, F. Liu, N. Venkatasubramanian, and C. Hsu, “WinSet: The first multi-modal window dataset for heterogeneous window states in smart cities,” in *Proc. of ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys’21)*, Coimbra, Portugal, November 2021, Note Paper, pp. 192–195.
- [25] F. Liu, T. Fan, C. Grant, C. Hsu, and N. Venkatasubramanian, “DragonFly: Drone-assisted high-rise monitoring for fire safety,” in *Proc. of IEEE International Symposium on Reliable Distributed Systems (SRDS’21)*, Chicago, IL, September 2021, pp. 331–342.
- [26] C. Wu, X. Li, R. Rajesh, W. Ooi, and C. Hsu, “Dynamic 3D point cloud streaming: Distortion and concealment,” in *Proc. of ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV’21)*, Istanbul, Turkey, September 2021, pp. 98–105.
- [27] T. Chang, G. Bouloukakakis, C. Hsieh, C. Hsu, and N. Venkatasubramanian, “SmartParcels: Cross-layer IoT planning for smart communities,” in *Proc. of ACM/IEEE Conference on Internet of Things Design and Implementation (IoTDI’21)*, Nashville, TN, May 2021, pp. 195–207.
- [28] Y. Wang, V. Dubey, and C. Hsu, “Image download and rate allocation of Internet-of-Things analytics at gateways in smart cities,” in *Proc. of IEEE Global Communications Conference (GLOBECOM’20)*, Taipei, Taiwan, December 2020, pp. 1–6.
- [29] Y. Li, C. Hsu, Y. Lin, and C. Hsu, “Performance measurements on a cloud VR gaming platform,” in *Proc. of ACM Workshop on Quality of Experience in Visual Multimedia Applications (QoEVMA’20)*, Seattle, WA, October 2020, pp. 37–45.

- [30] M. Tsai, N. Venkatasubramanian, and C. Hsu, “Analytics-aware storage of surveillance videos: Implementation and optimization,” in *Proc. of IEEE International Conference on Smart Computing (SMARTCOMP’20)*, Bologna, Italy, September 2020, pp. 25–32.
- [31] P. Venkateswaran, C. Hsu, S. Mehrotra, and N. Venkatasubramanian, “REAM: Resource efficient adaptive monitoring of community spaces at the edge using reinforcement learning,” in *Proc. of IEEE International Conference on Smart Computing (SMARTCOMP’20)*, Bologna, Italy, September 2020, pp. 17–24, **Best Paper Award**.
- [32] C. Wu, C. Hsu, T. Kuo, C. Griwodz, M. Riegler, G. Morin, and C. Hsu, “PCC Arena: A benchmark platform for point cloud compression algorithms,” in *Proc. of ACM International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE’20)*, Istanbul, Turkey, June 2020, pp. 1–6.
- [33] I. Ali, R. Chang, C. Hsu, and C. Lee, “LOCI: A mobile Q&A system with multi-modal motivation scheme for local intent questions in dynamic social networks,” in *Proc. of IEEE Vehicular Technology Conference (VTC’20-Spring)*, Antwerp, Belgium, May 2020, pp. 1–6.
- [34] I. Ali, R. Chang, and C. Hsu, “CRED: Credibility-enabled social network based Q&A system for assessing answers correctness,” in *Proc. of IEEE Wireless Communications and Networking Conference Communications (WCNC’20)*, Seoul, Korea, April 2020, pp. 1–6.
- [35] A. Chio, G. Bouloukakis, C. Hsu, S. Mehrotra, and N. Venkatasubramanian, “Adaptive mediation for data exchange in IoT systems,” in *Proc. of ACM/IFIP Adaptive and Reflective Middleware Workshop (ARM’19)*, Davis, CA, December 2019, pp. 1–6.
- [36] S. Yen, C. Fan, and C. Hsu, “Streaming 360° videos to head-mounted virtual reality using DASH over QUIC transport protocol,” in *Proc. of ACM International Packet Video Workshop (PV’19)*, Amherst, MA, June 2019, pp. 7–12.
- [37] F. Liu, Q. Zhu, M. Uddin, C. Hsu, and N. Venkatasubramanian, “Cost-effective sensor data collection from Internet-of-Things zones using existing transportation fleets,” in *Proc. of IEEE International Conference on Smart Computing (SMARTCOMP’19)*, Washington, DC, June 2019, pp. 340–349.
- [38] S. Yao, C. Fan, and C. Hsu, “Towards quality-of-experience models for watching 360° videos in head-mounted virtual reality,” in *Proc. of IEEE International Conference on Quality of Multimedia Experience (QoMEX’19)*, Berlin, Germany, June 2019, Short Paper, pp. 1–3.
- [39] I. Ali, R. Chang, and C. Hsu, “SORT: Social helper selection scheme for multi-hop question answering systems,” in *Proc. of IEEE International Conference on Computing, Networking and Communications (ICNC’19)*, Honolulu, HI, February 2019, pp. 647–652.
- [40] W. Lo, C. Huang, and C. Hsu, “Edge-Assisted rendering of 360° videos streamed to head-mounted virtual reality,” in *Proc. of IEEE International Symposium on Multimedia (ISM’18)*, Taichung, Taiwan, December 2018, pp. 44–51.
- [41] Y. Lai and C. Hsu, “Refocusing supports of panorama light-field images in head-mounted virtual reality,” in *Proc. of ACM International Workshop on Multimedia Alternate Realities (AltMM’18)*, Seoul, Korea, October 2018, pp. 15–20.

- [42] Q. Zhu, M. Uddin, N. Venkatasubramanian, and C. Hsu, “Spatiotemporal scheduling for crowd augmented urban sensing,” in *Proc. of IEEE International Conference on Computer Communications (INFOCOM’18)*, Honolulu, HI, April 2018, pp. 1997–2005.
- [43] H. Hong, P. Tsai, A. Cheng, M. Uddin, N. Venkatasubramanian, and C. Hsu, “Supporting Internet-of-Things analytics in a fog computing platform,” in *Proc. of IEEE International Conference on Cloud Computing Technology and Science (CloudCom’17)*, Hong Kong, China, December 2017, pp. 138–145, **Best Paper Award**.
- [44] M. Rahman, A. Rahman, A. Afrin, H. Hong, P. Tsai, M. Uddin, N. Venkatasubramanian, and C. Hsu, “Adaptive sensing using Internet-of-Things with constrained communications,” in *Proc. of ACM/IFIP/USENIX Adaptive and Reflective Middleware Workshop (ARM’17)*, Las Vegas, NV, December 2017, pp. 6:1–6:6.
- [45] C. Hsu, A. Chen, C. Hsu, C. Huang, C. Lei, and K. Chen, “Is foveated rendering perceivable to VR users? A study on the efficiency and consistency of subjective assessment methods,” in *Proc. of ACM International Conference on Multimedia (Multimedia’17)*, Mountain View, CA, October 2017, pp. 55–63.
- [46] W. Lo, C. Fan, S. Yen, and C. Hsu, “Performance measurements of 360° video streaming to head-mounted displays over live 4G cellular networks,” in *Proc. of Asia-Pacific Network Operations and Management Symposium (APNOMS’17)*, Seoul, Korea, October 2017, **Student Travel Grant**, pp. 1–6.
- [47] P. Tsai, H. Hong, A. Cheng, and C. Hsu, “Distributed analytics in fog computing platforms using TensorFlow and Kubernetes,” in *Proc. of Asia-Pacific Network Operations and Management Symposium (APNOMS’17)*, Seoul, Korea, October 2017, pp. 1–6.
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Government Grants, Serving as Principal Investigator

- 2023–2025: “Digital Twin Enabled Smart Cities: Architectural Design, Implementation, and Optimization,” NSTC General Research Project (#112-2221-E-007-090-MY3), NTD 2637k, PI.
- 2022: “Dynamic Point Cloud Compression, Adaptation, and Concealment Under Heterogeneous Streaming Scenarios,” NSTC General Research Project (#111-2221-E-007-060), NTD 740k, PI.

- 2021: “6DoF Edge-Assisted Cloud XR Gaming Platform with Observer Support: Implementation and Optimization,” MOST General Research Project (#110-2221-E-007-102), NTD 754k, PI.
- 2019–2020: “VR Video Streaming Services in 5G edge Computing Architecture,” NTHU Cross-Strait Tsing Hua Collaborative Project, NTD 600k, PI.
- 2018–2020: “Teleporting Through Space Across Time Using Head-Mounted Displays: A Case Study for Real Estate,” MOST General Research Project (#107-2221-E-007-091-MY3), NTD 3657k, PI.
- 2018: “Optimizing Internet-of-Things Analytics Platforms in Smart Spaces Using Multimedia Edge Computing,” MOST Subsidy for Short-Term Research Abroad for Technologists Project (#107-2918-I-007-014), NTD 556k, PI.
- 2017: “Optimal 360 Video Streaming for Social VR Systems,” MOST General Research Project (#106-2221-E-007-101), NTD 737k, PI.
- 2016: “Research on Fog Computing for Next-generation Distributed Multimedia Applications,” MOST General Research Project (#105-2221-E-007-088), NTD 715k, PI.
- 2016: “Network Infrastructure Virtualization and Cloud Platform for Future Mobile Communications,” NTHU Cross-Strait Tsing Hua Collaborative Project, NTD 500k, PI.
- 2013–2015: “An Efficient Crowdsourcing Platform for Multimedia Content Gathering and Sharing,” MOST Excellent Junior Research Investigator Research Project (#102-2221-E-007-062-MY3), NTD 1865k, PI.
- 2011–2012: “An Efficient Multimedia Dissemination Platform for Multihomed Smartphones,” NSC New Staff Research Project (#100-2218-E-007-015-MY2), NTD 1217k, PI.

Industrial Grants, Serving as Principal Investigator

- 2024: “Unmanned Vehicle Communication and Collaborative Management Technology,” Industrial Technology Research Institute, NTD 600k, PI.
- 2023: “Standards for Drone Swarm Collaboration and Management System,” Industrial Technology Research Institute, NTD 600k, PI.
- 2022–2025: “Enabling XR Cloud Gaming in 6G Cellular Networks: Prototype and Optimization,” MediaTek Inc., NTD 4200k, PI.
- 2017–2019: “Managed Internet-of-Things Platforms - Mechanisms and Optimization,” LITE-ON Technology Corporation, NTD 4800k, PI.
- 2017: “CPS Knowledge Base Database,” Industrial Technology Research Institute, NTD 198k, PI.
- 2016: “CPS Knowledge Base Web Service,” Industrial Technology Research Institute, NTD 300k, PI.
- 2016: “Research on 5G Cloud Platform Architecture,” Institute for Information Industry, NTD 1000k, PI.
- 2015–2016: “Improving Wireless Screencast in Conference Rooms,” AWIND Inc./Barco, NTD 750k, PI.
- 2013: “Research on Multi-format Video Codec Library for Embedded Systems,” Industrial Technology Research Institute, NTD 600k, PI.
- 2012: “UPDATE: User-Profile-Driven Dynamic Data Transfer–Theory and Implementation,” HTC Corporation, NTD 1949k, PI.

Government Grants, Serving as Co-Principal Investigator

- 2019–2021: “5G-AIoT Technology and Application Research Center,” MOE Higher Education Sprout Project, NTD 12580k, Co-PI.
- 2018–2019: “Research on Smart Edge Computing, Big Data, and Internet-of-Things: Taking Smart City as a Case Study,” MOE Higher Education Sprout Project, NTD 9000k, Co-PI.
- 2017: “Intelligent Life and Environments: Using Smart Bike as the Platform of Wearable Applications, Research and Promotion,” MOST Integrated Research

- Project (#106-3011-E-007-001), NTD 3407k, Co-PI.
- 2016–2018: “Alliance of Cloud Technology and Services,” MOST University-Industry Collaboration Project (#107-2622-8-007-004-TE2, 106-2622-8-007-005-TE2, and 105-2622-8-007-005-TE2), NTD 7324k, Co-PI.
 - 2015: “Optimization and Resource Management of Cloud Computing Platform for 5G Mobile Communications,” MOST Integrated Research Project (#104-2221-E-007-053), NTD 623k, Co-PI.
 - 2015: “An Experimental Cloud Computing Platform for 5G Mobile Communications,” MOST Integrated Research Project (#104-2221-E-002-082), NTD 2236k, Co-PI.
 - 2015: “Development of Advanced Manufacturing Technologies for High Value Added Intelligent Coil Leveling and Pressing Machines Through Human-Centered Designs and Mechatronic Integration,” MOST Integrated Research Project (#104-3011-E-007-001), NTD 4996k, Co-PI.
 - 2014–2016: “Application Platform for Next Generation Communication and Networking–Development of an Urban Computing Platform,” MOST Integrated Research Project (#103-2218-E-007-021, 104-3115-E-007-004, and 105-2218-E-007-011), NTD 14811k, Co-PI.
 - 2014–2016: “Intelligent Life and Environments: Using Smart Bike as the Platform of Wearable Applications,” MOST Integrated Research Project (#103-2218-E-007-015, 104-3115-E-007-001, and 105-2218-E-007-005), NTD 16262k, Co-PI.
 - 2014: “SDN-enabled Cloud-based Wireless and Broadband Network Technologies & Services,” MOST University-Industry Collaboration Project (#103-2622-E-009-012), NTD 57000k, Co-PI.

Industrial Grants, Serving as Co-Principal Investigator

- 2022–2023: “Distributed Learning for Edge AI Applications,” Qualcomm Technologies, Inc., NTD 5008k, Co-PI.
- 2020–2021: “Machine Learning on Edge Computing Platforms,” Qualcomm Technologies, Inc., NTD 5595k, Co-PI.
- 2019–2020: “Development for AI Related Edge and Infrastructure,” United Microelectronics Corporation, NTD 990k, Co-PI.
- 2018: “Artificial Intelligence Systems Integration: Edge Computing and Model Reduction,” United Microelectronics Corporation, NTD 234k, Co-PI.

SUPERVISED THESES

- 2020: “Optimizing Immersive Video Streaming to Head-Mounted Virtual Reality,” Ching-Ling Fan (Ph.D. from 2016)
- 2020: “Social Network-Based Question Answering Systems,” Imad Ali (Co-supervised with Prof. Ronald Y. Chang, Ph.D. from 2014)
- 2018: “Optimal Resource Allocation for Analytics and Multimedia Applications in Cloud-to-Things Continuum Platforms,” Hua-Jun Hong (Ph.D. from 2014)
- 2022: “A Multi-Tenant System for Deploying Deep Neural Networks in a Thing-to-Cloud Continuum,” Chia-Ying Hsieh (Master from 2020)
- 2022: “HPFL: Federated Learning by Fusing Multiple Sensor Modalities with Heterogeneous Privacy Sensitivity Levels,” Yuanjie Chen (Master from 2020)
- 2022: “Enhancing Situational Awareness with Adaptive Firefighting Drones: Leveraging Diverse Media Types and Classifiers,” Tzu-Yi Fan (Master from 2020)
- 2022: “On Error Concealment of Dynamic 3D Point Cloud Streaming,” Tzu-Kuan Hung (Master from 2020)
- 2021: “Optimizing Immersive Video Coding Configurations Using Deep Learning Approaches,” Tse-Hou Hung (Master from 2019)
- 2021: “Quantitative Comparison of Point Cloud Compression Algorithms,” Cheng-Hao Wu (Master from 2019)
- 2021: “Multi-level Feature-driven Storage Management of Surveillance Videos,”

- Min-Han Tsai (Master from 2020)
- 2020: “Image Download and Rate Allocation of Internet-of-Things Analytics at Gateways in Smart Cities,” Yu-Jung Wang (Master from 2017)
 - 2019: “Preemptive Multiplexed HTTP Streaming of 360° Tiled Videos to Head-Mounted Displays,” Shou-Cheng Yen (Master from 2018)
 - 2019: “Capitalizing Light-Field Technology in Head-Mounted Virtual Reality,” Yu-Ming Lai (Master from 2017)
 - 2018: “Modeling Quality-of-Experience of 360° Videos in Head-Mounted Virtual Reality,” Shun-Huai Yao (Master from 2016)
 - 2018: “Dynamic and Salable Deployment of Edge Internet-of-Things Analytics,” Pei-Hsuan Tsai (Master from 2016)
 - 2018: “Edge-Assisted 360-degree Video Streaming for Head-Mounted Virtual Reality,” Wen-Chih Lo (Master from 2016)
 - 2017: “Building a Next-Generation Cloud Gaming Platform with Planar Map Streaming and Distributed Rendering,” Ping-Chun Wang (Master from 2016)
 - 2017: “User Experience of Gamified Mobile Crowdsourcing in Smart Cities,” Aylada Khunvaranont (Master from 2015)
 - 2017: “Traffic-Engineer in Software Defined Networks using Label Switching,” Chen-Nien Mao (Master from 2015)
 - 2017: “Efficient Mobile Crowdsourcing via Gamification for Smart City Applications,” Ying-Yi Chen (Master from 2015)
 - 2016: “Optimizing Live Game Streaming Platforms Using Segment-of-Interests,” Tao-Ya Fan Chiang (Master from 2014)
 - 2016: “Predicting Resource Availability in a Multimedia Fog Computing Platform,” Yi-Ying Huang (Master from 2014)
 - 2016: “A Load-Balanced Video Multicast Routing System in Software-Defined Networks,” Meng-Wei Lee (Master from 2013)
 - 2015: “Placing Virtual Machines to Optimize Cloud Gaming Experience,” Hua-Jung Hong (Master from 2013)
 - 2015: “Turning Mininet/Open vSwitch into A Detailed OpenFlow Emulator,” Yi-Jun Cheng (Master from 2013)
 - 2015: “Distribution of News Videos to Mobile Devices over Challenged Networks,” Shu-Ting Wang (Master from 2013)
 - 2015: “Detour Planning Problem on Mobile Crowdsensing Systems,” Chen-Chieh Liao (Master from 2012)
 - 2015: “MPEG-DASH Standard with SVC Video Streaming on Android Mobile Devices,” Chien-Chang Chen (Master from 2012)
 - 2014: “Optimizing Mobile Middleware for Coordinated Sensor Activations,” Ting-Fang Hou (Master from 2012)
 - 2014: “Mobile Cloud Offloading on Crowdsensing Platform,” Ting-Yi Lin (Master from 2012)
 - 2013: “A Resource-Constrained Asymmetric Redundancy Elimination Algorithm,” Yu-Sian Li (Master from 2011)
 - 2013: “Reducing Training Overhead of Large Time-Scale Transfer Scheduling for Mobile Devices,” Ting-An Lin (Master from 2011)

SUPERVISED
NSTC
UNDERGRADUATE
PROJECTS

- 2023: “On Privacy Preservation of Head-Mounted Display Users in Virtual Worlds,” Shin-Yi Zheng
- 2023: “First Look at Digital Twin Enabled Smart Wind Turbines for Green Electricity,” Cheng-Chia Lai
- 2022: “Optimal Camera Placement for 6 Degree-of-Freedom Multicast of 3D Scenes,” Yuan-Chun Sun
- 2020: “On Quality-of-Experience Measurements of Extended Reality (XR) Games,”

Chia-Hsin Hsu

- 2020: “On Latency Reduction of XR Cloud Gaming Platforms,” Yen-Chun Li
- 2020: “Porting a Cloud Gaming System to Support XR Games with Head-Mounted Displays,” Yu-Chun Lin
- 2019: “Distributed Brokers in Internet-of-Thing Zones: Mechanism and Optimization,” Chia-Ying Hsieh
- 2018: “Streaming Scalable Video Sequences with Media-aware Network Elements,” Chao-Wen Chen
- 2018: “Joint Tile Selection and Rate Allocation for Foveated 360 Video Streaming to Eye-tracking HMD,” Yu-Tung Pai
- 2017: “Context-aware Resource Prediction of Crowdsourced Computers for Animation Rendering,” Jo-Chi Chuang
- 2016: “Cloud Game Streaming Platform to Glass-free 3D Displays,” Hsin-Yu Chang
- 2015: “Building an Efficient Software Defined Network Emulator,” Cheng-Lin Li
- 2014: “Optimizing the Encoding Bitrate of an Open-source VoIP Implementation,” Wei-Wei Tseng
- 2013: “On Prediction Algorithms for Social Media Sharing Using Mobile Devices,” Chen-Chung Hsu

SELECTED THESIS SERVICE

- Opponent for Gazi Illahi, Ph.D., Aalto University, June 2024
- Pre-Examiner for Gazi Illahi, Ph.D., Aalto University, October 2023
- Reviewer for Jesus Aguilar Armijo, Ph.D., Klagenfurt University, April 2023
- Examiner for Branislav Jenco, Master, University of Oslo, June 2022
- Reviewer for Ashutosh Singla, Ph.D., Ilmenau University of Technology, November 2021
- Examiner for Henry Haugsteen Hansen, Master, University of Oslo, July 2020
- Examiner for Praveen Kumar Yadav, Ph.D., National University of Singapore, July 2020
- External Pre-examiner for Teemu Kamarainen, Ph.D., Aalto University, November 2019
- Opponent for Francisco Javier Velazquez-García, Ph.D., University of Oslo, May 2019
- Opponent for Kristoffer Robin Stokke, Ph.D., University of Oslo, February 2017
- Examiner for Atle Nordland, Master, University of Oslo, September 2016
- Committee Member for Chien-Nan Chen, Ph.D., University of Illinois Urbana-Champaign, September 2015
- Examiner for Warren Harrop, Ph.D., Swinburne University of Technology, February 2014
- Examiner for Ben Tomlin, Master, University of Oslo, December 2013
- Committee Member for Yichuan Wang, Ph.D., University of California Davis, March 2011

COMMUNITY SERVICE

- Associate Editor, ACM Transactions on Multimedia Computing, Communications and Applications (ACM TOMM), January 2014 to Present
- Associate Editor, IEEE Technical Committee on Multimedia Communications (MMTC) E-Letter, October 2012 to October 2014
- Guest Editor, IEEE MultiMedia, Special Issue on Recent Advances in Immersive Multimedia, October 2022
- Guest Editor, MDPI Sensors, Special Issue on Communication in Networks of Unmanned Aerial Vehicles (UAVs), June 2020
- Guest Editor, ACM Transactions on Multimedia Computing, Communications and

- Applications (ACM TOMM), Special Issue on Delay-Sensitive Video Computing in the Cloud, April/May 2018
- Guest Editor, ACM Transactions on Multimedia Computing, Communications and Applications (ACM TOMM), Special Section on MMSys/NOSSDAV 2017 Best Papers, April/May 2018
 - Key Member, IEEE Technical Committee on Multimedia Communications (MMTC) Multimedia Cloud Computing Interest Group (MCCIG), May 2015 to April 2020
 - Committee Member, ACM Special Interest Group on Multimedia (SIGMM) History Preservation Committee, January 2010 to January 2014
 - Committee Member, IEEE Technical Committee on Multimedia Communications (MMTC) Review Board Committee, August 2010 to July 2012
 - Mentoring Co-chair, ACM SIGMM Conference on Multimedia Systems (MMSys'25), March 2025
 - Tutorial Chair, IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR'24), August 2024
 - Publication Co-chair, IEEE International Conference on Smart Computing (SMARTCOMP'24), June 2024
 - Keynote/DEP Co-chair, IEEE/IFIP Network Operations and Management Symposium (NOMS'24), May 2024
 - Distinguished Experts Panel (DEP) Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'23), September 2023
 - Grand Challenge Chair, ACM SIGMM Conference on Multimedia Systems (MMSys'23), June 2023
 - Publication Co-chair, IEEE International Conference on Smart Computing (SMARTCOMP'23), June 2023
 - Workshop Co-Chair, IEEE International Conference on Multimedia Big Data (BigMM'22), December 2022
 - Distinguished Experts Panel (DEP) Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'22), September 2022
 - Publication Co-chair, IEEE International Conference on Smart Computing (SMARTCOMP'22), June 2022
 - Workshop Co-Chair, IEEE International Conference on Multimedia Big Data (BigMM'21), November 2021
 - Publicity Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'21), September 2021
 - Publication Co-chair, IEEE International Conference on Smart Computing (SMARTCOMP'21), July 2021
 - General Co-chair, ACM SIGMM Conference on Multimedia Systems (MMSys'21), June 2021
 - Publicity Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'20), September 2020
 - Demonstration Co-chair, IEEE International Conference on Multimedia Big Data (BigMM'19), September 2019
 - Publicity Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'19), September 2019
 - Publicity Co-chair, ACM SIGMM Conference on Multimedia Systems (MMSys'18), June 2018
 - Poster Co-chair, IEEE/IFIP Network Operations and Management Symposium (NOMS'18), April 2018
 - Area Co-chair, Mobile and Wearable Multimedia, ACM International Conference on Multimedia (Multimedia'17), October 2017
 - Technical Program Co-chair, ACM SIGMM Conference on Multimedia Systems (MMSys'17), June 2017
 - Poster Co-chair, IEEE Asia-Pacific Network Operations and Management Sympos-

- sium (APNOMS'17), September 2017
- Poster Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'16), October 2016
- Track Co-chair, Mobile Computing and Social Media Track, IEEE International Conference on Embedded and Ubiquitous Computing (EUC'15), October 2015
- Poster Co-chair, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'15), August 2015
- Proceedings Chair, ACM SIGMM Conference on Multimedia Systems (MMSys'15), March 2015
- Publicity Chair, IEEE International Conference on Parallel and Distributed Systems (ICPADS'14), December 2014
- Symposium Co-chair, Internet Services and Applications Symposium, IEEE International Conference on Computing, Networking and Communications (ICNC'14), February 2014
- Local Arrangement Chair, Workshop on Wireless, Ad Hoc and Sensor Networks (WASN'13), August 2013
- Technical Program Co-chair, ACM Workshop on Mobile Video (MoVid'13), February 2013
- Technical Program Co-chair, ACM Workshop on Mobile Video (MoVid'12), February 2012
- Proceedings and Web Chair, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'10), June 2010
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'24), October 2024
- Technical Program Committee Member, IEEE International Workshop on Surpassing Latency Limits in Adaptive Live Video Streaming (LIVES'24), July 2024
- Technical Program Committee Member, IEEE International Workshop on Ultra Low-Latency and Robust Multimedia Delivery (ULRMD'24), July 2024
- Technical Program Committee Member, IEEE International Conference on Multimedia and Expo (ICME'24), July 2024
- Technical Program Committee Member, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'24), June 2024
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'24), April 2024
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'23), OSS Track, October 2023
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'23), October 2023
- Technical Program Committee Member, IEEE International Conference on Network Protocols (ICNP'23), October 2023
- Technical Program Committee Member, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'23), June 2023
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'23), June 2023
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'22), October 2022
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'22)–Doctoral Symposium, October 2022
- Technical Program Committee Member, IEEE International Conference on Multimedia and Expo (ICME'22), July 2022
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'22), June 2022

- Technical Program Committee Member, IEEE/IFIP Network Operations and Management Symposium (NOMS'22), April 2022
- Technical Program Committee Member, IEEE International Workshop on Building the Foundations of the Metaverse (METABUILD'22), March 2022
- Technical Program Committee Member, IEEE Global Communications Conference–Communication & Information Systems Security (GLOBECOM–CISS'21), December 2021
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'21), October 2021
- Technical Program Committee Member, IEEE International Conference on Multimedia and Expo (ICME'21), July 2021
- Technical Program Committee Member, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'21), June 2021
- Technical Program Committee Member, IEEE International Conference on Communications–Next Generation Networking and Internet Symposium (ICC–NGNI'21), June 2021
- Technical Program Committee Member, IFIP/IEEE International Symposium on Integrated Network Management (IM'21), May 2021
- Technical Program Committee Member, International World Wide Web Conference (WWW'21), April 2021
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'20), October 2020
- Technical Program Committee Member, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'20), September 2020
- Technical Program Committee Member, IEEE International Conference on Multimedia and Expo (ICME'20), July 2020
- Technical Program Committee Member, ACM International Packet Video Workshop (PV'20), June 2020
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'20), June 2020
- Technical Program Committee Member, IEEE International Conference on Communications–Next Generation Networking and Internet Symposium (ICC–NGNI'20), June 2020
- Technical Program Committee Member, IEEE/IFIP Network Operations and Management Symposium (NOMS'20), April 2020
- Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC'20), February 2020
- Technical Program Committee Member, ACM International Workshop on Technology Enablers and Innovative Applications for Smart Cities (TESCA'19), November 2019
- Technical Program Committee Member, IEEE International Conference on Big Data Intelligence and Computing (DataCom'19), November 2019
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'19), October 2019
- Technical Program Committee Member, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'19), September 2019
- Technical Program Committee Member, IEEE International Conference on Multimedia and Expo (ICME'19), July 2019
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'19), June 2019
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'19) Demo Session, June 2019
- Technical Program Committee Member, IEEE International Conference on

- Communications–Next Generation Networking and Internet Symposium (ICC–NGNI’19), May 2019
- Technical Program Committee Member, International World Wide Web Conference (WWW’19), May 2019
 - Technical Program Committee Member, IFIP/IEEE International Symposium on Integrated Network Management (IM’19), April 2019
 - Technical Program Committee Member, IEEE International Workshop on Context-Awareness for Multi-Device Pervasive and Mobile Computing (PerCrowd’19), March 2019
 - Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC’19), February 2019
 - Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia’18), October 2018
 - Technical Program Committee Member, IEEE Approaches, Analyses, and Performance Issues in Virtualized Environments and Software Defined Networking (PVE-SDN’18), June 2018
 - Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys’18) Demo Session, June 2018
 - Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys’18), June 2018
 - Technical Program Committee Member, IEEE International Conference on Communications–Next Generation Networking and Internet Symposium (ICC–NGNI’18), May 2018
 - Technical Program Committee Member, IEEE/IFIP Network Operations and Management Symposium (NOMS’18), April 2018
 - Technical Program Committee Member, International Workshop on Interactive and Spatial Computing (IWISC’18), April 2018
 - Technical Program Committee Member, IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR’18), April 2018
 - Technical Program Committee Member, International World Wide Web Conference (WWW’18), April 2018
 - Technical Program Committee Member, IEEE International Conference on Cloud Engineering (IC2E’18), April 2018
 - Technical Program Committee Member, IEEE International Workshop on Pervasive Systems Integration (PerSysT’18), March 2018
 - Technical Program Committee Member, IEEE International Workshop on Context-Awareness for Multi-Device Pervasive and Mobile Computing (PerCrowd’18), March 2018
 - Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC’18), March 2018
 - Technical Program Committee Member, IEEE International Symposium on Multimedia (ISM’17), December 2017
 - Technical Program Committee Member, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS’17), September 2017
 - Technical Program Committee Member, IEEE International Conference on Computer Communications and Networks (ICCCN’17), July 2017
 - Technical Program Committee Member, IEEE International Conference on Communications–Next Generation Networking and Internet Symposium (ICC–NGNI’17), May 2017
 - Technical Program Committee Member, IEEE International Conference on Cloud Engineering (IC2E’17), April 2017
 - Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC’17), January 2017
 - Technical Program Committee Member, IEEE International Symposium on Multi-

- media (ISM'16), December 2016
- Technical Program Committee Member, ACM/IFIP/USENIX International Middleware Conference (Middleware'16), December 2016
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'16), October 2016
- Technical Program Committee Member, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'16), October 2016
- Technical Program Committee Member, ACM Workshop on Micro Aerial Vehicle Networks, Systems, and Applications for Civilian Use (DroNet'16), May 2016
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'16), Special Session on Media Synchronization, May 2016
- Technical Program Committee Member, ACM Workshop on Mobile Video (MoVid'16), May 2016
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'16), May 2016
- Technical Program Committee Member, IEEE International Conference on Communications–Next Generation Networking Symposium (ICC–NGN'16), May 2016
- Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC'16), February 2016
- Technical Program Committee Member, IEEE Global Conference on Signal and Information Processing (GlobalSIP'15), December 2015
- Technical Program Committee Member, ACM/IFIP/USENIX International Middleware Conference (Middleware'15), December 2015
- Technical Program Committee Member, IEEE/ACM Workshop on Network and Systems Support for Games (NetGames'15), December 2015
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'15), October 2015
- Technical Program Committee Member, IEEE Asia-Pacific Network Operations and Management Symposium (APNOMS'15), August 2015
- Technical Program Committee Member, IEEE International Conference on Computer Communications and Networks (ICCCN'15), August 2015
- Technical Program Committee Member, IEEE International Conference on Distributed Computing Systems (ICDCS'15), June 2015
- Technical Program Committee Member, IEEE International Conference on Communications–Next Generation Networking Symposium (ICC–NGN'15), June 2015
- Technical Program Committee Member, ACM Workshop on Micro Aerial Vehicle Networks, Systems, and Applications for Civilian Use (DroNet'15), May 2015
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'15) Dataset Track, March 2015
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys'15), March 2015
- Technical Program Committee Member, ACM Workshop on Mobile Video (MoVid'15), March 2015
- Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC'15), February 2015
- Technical Program Committee Member, IEEE International Conference on Parallel and Distributed Systems (ICPADS'14), December 2014
- Technical Program Committee Member, IEEE/ACM Workshop on Network and Systems Support for Games (NetGames'14), December 2014
- Technical Program Committee Member, Workshop on Information Technology Innovation, Industrial Application and Internet of Things (ITIIAIT'14), December 2014

- Technical Program Committee Member, IEEE Global Communications Conference–Communications Software, Services and Multimedia Symposium (GLOBECOM–CSSM’14), December 2014
- Technical Program Committee Member, IEEE Global Communications Conference–Wireless Networking Symposium (GLOBECOM–WN’14), December 2014
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia’14), November 2014
- Technical Program Committee Member, International Conference on High-Performance Compilation, Computing, and Communications (HP3C’14), September 2014
- Technical Program Committee Member, ACM SIGMM Conference on Multimedia Systems (MMSys’14), March 2014
- Technical Program Committee Member, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV’14), March 2014
- Technical Program Committee Member, ACM Workshop on Mobile Video (MoVid’14), March 2014
- Technical Program Committee Member, IEEE International Conference on Communications–Mobile and Wireless Networking Symposium (ICC–MWN’14), June 2014
- Technical Program Committee Member, IEEE Global Communications Conference–Communications Software, Services and Multimedia Symposium (GLOBECOM–CSSM’13), December 2013
- Technical Program Committee Member, IEEE Global Communications Conference–Wireless Networking Symposium (GLOBECOM–WN’13), December 2013
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia’13), October 2013
- Technical Program Committee Member, IEEE International Conference on Distributed Computing Systems (ICDCS’13), July 2013
- Technical Program Committee Member, IEEE International Symposium on Consumer Electronics (ISCE’13), June 2013
- Technical Program Committee Member, IEEE International Conference on Advanced Information Networking and Applications (AINA’13), March 2013
- Technical Program Committee Member, IEEE International Conference and Workshops on Cloud Computing Technology and Science–Industrial Applications (Cloud-Com’12), December 2012
- Technical Program Committee Member, IEEE Workshop on Quality of Experience for Multimedia Communications (QoEMC’12), December 2012
- Technical Program Committee Member, IEEE International Conference on Parallel and Distributed Systems (ICPADS’12), December 2012
- Technical Program Committee Member, IEEE Global Communications Conference–Communications Software, Services and Multimedia Symposium (GLOBECOM–CSSM’12), December 2012
- Technical Program Committee Member, IEEE Global Communications Conference–Wireless Networking Symposium (GLOBECOM–WN’12), December 2012
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia’12), October 2012
- Technical Program Committee Member, International Conference on Computing, Networking, and Communications (ICNC’12), January 2012
- Technical Program Committee Member, IEEE International Conference on Parallel and Distributed Systems (ICPADS’11), December 2011
- Technical Program Committee Member, IEEE Global Communications Conference–Wireless Communications Symposium (GLOBECOM–WN’11), December 2011
- Technical Program Committee Member, IEEE International Conference on Com-

- puter Engineering and Systems (ICCES'11), November 2011
- Technical Program Committee Member, ACM International Conference on Multimedia (Multimedia'11), November 2011
- Technical Program Committee Member, International Conference on Embedded and Multimedia Computing (EMC'11), August 2011
- Technical Program Committee Member, IEEE International Conference on Multimedia and Expo (ICME'11), July 2011
- Technical Program Committee Member, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'11), June 2011
- Technical Program Committee Member, International ICST Conference on MOBILE Wireless MiddleWARE, Operating Systems, and Applications (MobilWare'11), June 2011
- Technical Program Committee Member, ACM Workshop on Mobile Video Delivery (MoViD'10), October 2010
- Technical Program Committee Member, International Conference on Embedded and Multimedia Computing (EMC'10), August 2010
- Technical Program Committee Member, ACM International Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'10), June 2010

AWARDS

IEEE, ACM, and Other Institutes

- Best Paper Award, ACM SIGCOMM Workshop on Emerging Multimedia Systems (EMS'24), August 2024
- Best Paper Award, ACM International Workshop on Multimedia Assisted Dietary Management (MADiMa'23), October 2023
- Honorable Mention Associate Editor, ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM), October 2021
- Best of the Best Program Committee Member, International World Wide Web Conference (WWW'21), April 2021
- AMiner Scholar's AI 2000 Most Influential Scholar Honorable Mention in Multimedia, April 2021
- Best Emergent Reviewer Award, ACM International Conference on Multimedia (Multimedia'20), October 2020
- Best Paper Award, IEEE International Conference on Smart Computing (SMART-COMP'20), September 2020
- Outstanding Reviewer Award, IEEE International Conference on Multimedia and Expo (ICME'20), July 2020
- Best Reviewer Award, IEEE/IFIP Network Operations and Management Symposium (NOMS'20), April 2020
- Best Paper Award, IEEE International Conference on Cloud Computing Technology and Science (CloudCom'17), December 2017
- Best Paper Award, Asia-Pacific Network Operations and Management Symposium (APNOMS'16), October 2016
- Best Associate Editor, ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM), September 2016
- IEEE Senior Member, the IEEE, from July 2016
- Invited Presenter, Multimedia Rising Stars, ACM International Conference on Multimedia (Multimedia'15), October 2015
- TAOS Best Paper Award, IEEE Global Communications Conference (GLOBE-COM'12), December 2012
- Best Paper Award, IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'12), April 2012

- Quality Reviewers Award, IEEE International Conference on Multimedia and Expo (ICME'11), July 2011
- Best Paper Award, IEEE International Conference on Innovations in Information Technology (Innovations'08), December 2008
- Best Demo Award, ACM International Conference on Multimedia (Multimedia'08), October 2008

Foundations for the Advancement of Outstanding Scholarship (FAOS)

- Outstanding Scholar Awards (for Retaining Domestic Scholars), 2018 to 2023

National Science Council

- Excellent Junior Research Investigator Grant, 2013 to 2016

University of California Irvine

- Annual Visiting Faculty Awards by the J. Yang and Family Foundation, Center for Asian Studies, 2023-2024
- Annual Visiting Faculty Awards by the J. Yang and Family Foundation, Center for Asian Studies, 2022-2023

National Tsing Hua University

- New Faculty Research Award, College of Electrical Engineering and Computer Science, National Tsing Hua University, 2014
- Outstanding New Faculty Stipend, Fall 2012 to Summer 2014

Simon Fraser University, Canada

- President's Ph.D. Research Stipend, Fall 2009
- School of Computing Science travel award, 2008/2009/2010
- Graduate fellowship, Spring 2009
- A.B.C. Recycling Ltd. graduate scholarship in intelligent systems, Spring 2009
- Graduate fellowship, Spring 2008
- Clark Wilson graduate scholarship in intelligent systems, Spring 2008
- Faculty of applied sciences graduate fellowship, Spring 2007
- Graduate entrance scholarship, Fall 2005

ACM SIGCOMM

- Travel grant, SIGCOMM'11 Conference, 2011
- Travel grant, SIGCOMM'08 Conference, 2008

The Phi Tau Phi Scholastic Honor Society of The Republic of China

- Honorary member, 2000

REFERENCES

Prof. Mohamed Hefeeda
Thesis Supervisor, Professor
Simon Fraser University
Burnaby, BC, Canada
phone: *+1-778-782-7577*
e-mail: *mhefeeda AT cs.sfu.ca*

Prof. Carsten Griwodz
Professor
University of Oslo
Oslo, Norway
phone: *+47-45258004*
e-mail: *griff AT ifi.uio.no*

Prof. Klara Nahrstedt
Professor
University of Illinois
Urbana, IL, USA
phone: *+1-217-244-6624*
e-mail: *klara AT illinois.edu*

Prof. Nalini Venkatasubramanian
Professor
University of California
Irvine, California, USA
phone: *+1-949-824-5898*
e-mail: *nalini AT ics.uci.edu*

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