

# MIN WU

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EDUCATION **Ph.D. Electrical Engineering**, Princeton University, 2001.  
Dissertation: Multimedia Data Hiding, April 2001. Advised by Prof. Bede Liu.

**B.S.E. Electrical Engineering** (highest honors), Tsinghua University, Beijing, 1996.  
Department of Automation, School of Information Sciences and Technologies

**B.A. Economics** (highest honors), Tsinghua University, Beijing, 1996.  
Dual-degree program, School of Economics and Management

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RESEARCH INTERESTS Info. Security and Digital Forensics; Signal Processing; Visual/Multimedia Computing & Communications; Data Science & Analytics Applications in Health/Biomedicine, Internet of Things (IoT) and Digital Humanities.

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PROFESSIONAL EXPERIENCE *Professor*, University of Maryland, College Park, since July 2011.  
*Associate Professor*, University of Maryland, College Park, 2006 – 2011.  
*Assistant Professor*, University of Maryland, College Park, 2001 – 2006.  
Department of Electrical and Computer Engineering;  
Institute of Advanced Computer Studies and Institute for Systems Research.

*Visiting Professor*, Johns Hopkins University, 2016.  
Electrical and Computer Engineering Department.

*Visiting Associate Professor*, Stanford University, 2007 – 2008.  
Electrical Engineering Department and Information Systems Laboratory.

*Intern*, Panasonic Information and Network Labs, Princeton, NJ, Summer 1999.

*Intern*, NEC Research Institute, Princeton, NJ, Summer 1998.

*Technical Advisor/Consultant*, for various industry R&D organizations.

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MAJOR HONORS AND AWARDS

1. *IEEE Fellow*, effective January 2011, “for contributions to multimedia security and forensics.”
2. *AAAS Fellow*, elected October 2017, “for distinguished contributions to the field of signal processing, particularly for multimedia security and forensics.”
3. *IEEE Distinguished Lecturer* (2015–2016), selected by the IEEE Signal Processing

Society.

4. *Distinguished Scholar-Teacher*, University of Maryland, an university-wide honor for excellence in research and teaching, 2013.
5. *ADVANCE Professor* (2014–2015) and *ADVANCE Fellow* (2015–present), University of Maryland, on the university committee and a lead for Engineering College and i-School, for mentoring and promoting gender diversity in the University.
6. *Meritorious Service Award* for “for exemplary service to and leadership in the Signal Processing Society,” IEEE Signal Processing Society, 2015.
7. *U.S. ONR Young Investigator Award (YIP)*, 2005.
8. *U.S. NSF Faculty Early Career Development Award (CAREER)*, 2002.

INVENTION &  
INNOVATOR  
AWARDS

9. *Innovator of the Year Award*, *The Daily Record* (State of Maryland), 2012.
10. *Invention of the Year Award* – Information Technology Category, University of Maryland, 2012 and 2015 (twice).
11. *Jimmy Lin Award for Invention/Innovation*, University of Maryland, 2012, 2015, and 2016.
12. Computer World “40 under 40” *Young Innovator Award*, 2007.  
Selected as one of the 40 innovative IT people under the age of 40.
13. *MIT “TR100” Young Innovator Award*, 2004.

MIT Technology Review Magazine’s Year 2004 list of 100 top young innovators under age of 35 “whose contribution to emerging technologies will profoundly influence our world, shaping how we live and work in the future.”

PAPER AWARDS

14. *IEEE Signal Processing Society 2005 Best Paper Award*, for a paper published in IEEE Transactions on Signal Processing.
15. *EURASIP 2004 Best Paper Award*, for a paper published in EURASIP Journal on Applied Signal Processing in 2004.
16. *Top 10% Paper Award*, IEEE Conference on Image Processing (ICIP), 2014.
17. Co-author of *Best Student Paper Awards: ICASSP 2005* (with student advisees A. Swaminathan and Y. Mao); *ACM Multimedia 2011* (with student advisees R. Garg and A. Varna).
18. “Classic Paper 2017” in security and cryptography, designated by Google Scholar for a journal article [J15] on robust and secure image hash, as the top 5 highly cited article published ten years ago in 2006 that “have stood the test of time.”

TEACHING AND  
EDUCATION  
AWARDS

19. *IEEE Mac Van Valkenburg Early Career Teaching Award*, 2009.  
For “outstanding contributions to undergraduate and graduate education in electrical and computer engineering, including innovative curricular development and influential mentoring.”
20. *E. Robert Kent Junior Faculty Teaching Award*, College of Engineering, University of Maryland, College Park, 2009-2010.
21. *George Corcoran Faculty Award*, University of Maryland, College Park, 2003.  
For outstanding contribution to electrical engineering education and teaching.

OTHER  
RECOGNITIONS

22. *Editor-in-Chief* (2015-2017), IEEE Signal Processing Magazine.
  23. Elected *Member-at-Large of the Board of Governors*, IEEE Signal Processing Society (term 2016–2018).
  24. Elected Chair (2012-2013), IEEE Information Forensics and Security Technical Committee (IFS TC).
  25. *Keynote/Plenary Speaker*, for several international conferences: IEEE International Conference on Image Processing (ICIP 2018), IEEE Multimedia Signal Processing Workshop (MMSP 2016), IEEE Int’l Workshop on Info. Forensics and Security (WIFS 2014), and Int’l Workshop on Digital Watermarking (IWDW 2004).
  26. Selected as one of 88 outstanding engineers under age 45 to participate in the 11<sup>th</sup> Frontier of Engineering Symposium organized by the National Academy of Engineering in 2005.
  27. Invited by the National Academies to attend the National Academies Presidents’ Circle 2012 Annual Meeting.
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## LIST OF PUBLICATIONS AND PATENTS

- Overview: Two books authored, one edited book, one book chapter; 53 journal papers published/inpress; 125 refereed conference papers; 10 U.S. patents issued and 5 patents pending; 5 paper awards.

Names in *italic* are my research advisees; names with ^ are students whose course projects that I advised were further developed into the publications.

- Citation Highlights:
  - **Google Scholar** citations:  $h = 54$ , about 10990 cites in total (as of January 2018); **Archival journal article** citations per Web of Science:  $h = 25$ , about 2865 cites in total; **Patents** cited by other patents and patent applications for about 820 times.
  - Several journal articles were in the Top downloads of the respective IEEE journals. And a total of 28 papers have received more than 100 cites each per Google Scholar data.

Researcher ID page <http://www.researcherid.com/rid/B-7501-2009> for ISI journal citation data; and <http://scholar.google.com/citations?user=tF0R04oAAAAJ> for Google citations. See ORCID <https://orcid.org/0000-0001-7672-9357> and <http://www.ece.umd.edu/~minwu/research.html> for electronic copies.

## BOOKS & BOOK CHAPTER

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1. **M. Wu** and B. Liu: *Multimedia Data Hiding*, Springer-Verlag Publisher, 220 pages (research monograph), ISBN# 0387954260, October 2002.
2. K.J.R. Liu, W. Trappe, Z.J. Wang, **M. Wu**, and H. Zhao: *Multimedia Fingerprinting Forensics for Traitor Tracing*, EURASIP Book Series on Signal Processing and Communications, Hindawi Publishing Co., ISBN# 9775945186, 2005.

3. **M. Wu** and Q. Sun: "Video Security and Protection," in *The Essential Guide to Image Processing*, edited by A. Bovik, Elsevier, 2009.
4. D.R. Bull, **M. Wu**, S. Theodoridis, and R. Chellappa (Eds): *Academic Press Library in Signal Processing (Vol.5): Image and Video Compression and Multimedia*, Elsevier, 2014.

JOURNAL PAPERS

ISI citation info at <http://www.researcherid.com/rid/B-7501-2009>

1. C-Y. Lin, **M. Wu**, Y-M. Lui, J.A. Bloom, M.L. Miller, and I.J. Cox: "Rotation, Scale, and Translation Resilient Public Watermarking for Images", *IEEE Trans. on Image Processing*, vol.10, no.5, pp.767-782, May 2001.
2. **M. Wu**, R. Joyce, H-S. Wong, L. Guan, and S-Y. Kung: "Dynamic Resource Allocation via Video Content and Short-term Traffic Statistics", *IEEE Trans. on Multimedia, Special Issue on Multimedia over IP*, vol.3, no.2, pp.186-199, June 2001.
3. W. Trappe, **M. Wu**, Z. Wang, and K.J.R. Liu: "Anti-collusion Fingerprinting for Multimedia", *IEEE Trans. on Signal Processing, Special issue on Signal Processing for Data Hiding in Digital Media and Secure Content Delivery*, vol. 51, no. 4, pp.1069-1087, April 2003. [Received 2005 **IEEE Signal Processing Society Best Paper Award**]
4. **M. Wu** and B. Liu: "Data Hiding in Image and Video: Part-I – Fundamental Issues and Solutions", *IEEE Trans. on Image Proc.*, vol.12, no.6, pp.685-695, June 2003.
5. **M. Wu**, H. Yu, and B. Liu: "Data Hiding in Image and Video: Part-II – Designs and Applications", *IEEE Trans. on Image Proc.*, vol.12, no.6, pp.696-705, June 2003.
6. **M. Wu**: "Joint Security and Robustness Enhancement for Quantization Based Embedding," *IEEE Trans. on Circuits and Systems for Video Technology, Special Issue on Authentication, Copyright Protection, and Information Hiding*, vol. 13, no. 8, pp.831-841, August 2003.
7. **M. Wu**, W. Trappe, Z. Wang, and K.J.R. Liu: "Collusion Resistant Fingerprinting for Multimedia", *IEEE Signal Processing Magazine, Special Issue on Digital Rights Management*, vol. 21, no. 2, pp.15-27, March 2004.
8. **M. Wu** and B. Liu: "Data Hiding in Binary Image for Authentication and Annotation", *IEEE Trans. on Multimedia*, vol. 6, no. 4, pp.528-538, August 2004.
9. Z. Wang, **M. Wu**, W. Trappe, and K.J.R. Liu: "Group-Oriented Fingerprinting for Multimedia Forensics", *EURASIP Journal on Applied Signal Processing, Special Issue on Multimedia Security and Rights Management*, vol.2004:14, pp.2153-2173, October 2004. [Received **2004 EURASIP Best Paper Award**]
10. H. Zhao, **M. Wu**, Z. Wang, and K.J.R. Liu: "Forensic Analysis of Nonlinear Collusion Attacks for Multimedia Fingerprinting," *IEEE Trans. on Image Proc.*, vol. 14, no. 5, pp.646-661, May 2005.
11. Z. Wang, **M. Wu**, H. Zhao, W. Trappe, and K.J.R. Liu: "Anti-Collusion Forensics of Multimedia Fingerprinting Using Orthogonal Modulation," *IEEE Trans. on Image Proc.*, vol. 14, no. 6, pp.804-821, June 2005.
12. G-M. Su and **M. Wu**: "Efficient Bandwidth Resource Allocation for Low-Delay Multiuser Video Streaming," *IEEE Trans. on Circuits and Systems for Video Technologies*, vol. 15, no. 9, pp. 1124-1137, Sept. 2005.
13. H. Gou and **M. Wu**: "Data Hiding in Curves with Applications to Fingerprinting Maps," *IEEE Trans. on Signal Proc.*, Special Issue on Secure Media, vol. 53, no. 10, pp. 3988-4005, Oct. 2005.
14. G-M. Su, Z. Han, **M. Wu**, and K.J.R. Liu, "Multiuser Cross-Layer Resource Allocation for Video

Transmission over Wireless Networks,” IEEE Network Magazine, Special Issue on Multimedia over Broadband Wireless Networks, vol. 20, no. 2, pp.21-27, March 2006.

15. *A. Swaminathan, Y. Mao, and M. Wu*: “Robust and Secure Hashing for Images,” IEEE Trans. on Info. Forensics and Security, vol. 1, no. 2, pp. 215-230, June 2006. [Web of Science **Highly Cited Paper** and Google Scholar “**Test-of-Time Classic Paper**”]
16. *S. He and M. Wu*: "Joint Coding and Embedding Techniques for Multimedia Fingerprinting," IEEE Trans. on Info. Forensics and Security, vol. 1, no. 2, pp. 231-247, June 2006.
17. *Y. Mao and M. Wu*: "A Joint Signal Processing and Cryptographic Approach to Multimedia Encryption", IEEE Trans. on Image Processing, vol. 15, no. 7, pp. 2061-2075, July 2006.
18. *M. Chen, Y-F. Zheng, and M. Wu*: "Classification-Based Spatial Error Concealment for Visual Communications," EURASIP Journal on Applied Signal Processing, Special Issue on Video Analysis and Coding for Robust Transmission, 2006.
19. *Y. Mao, Y. Sun, M. Wu, and K.J.R. Liu*: "JET: Dynamic Join-Exit-Tree Amortization and Scheduling for Contributory Key Agreement", ACM/IEEE Trans. on Networking, vol. 14, no. 5, pp. 1128-1140, Oct. 2006.
20. *G-M. Su, Z. Han, M. Wu, and K.J.R. Liu*, "A Scalable Multiuser Framework for Video Over OFDM Networks: Fairness and Efficiency", IEEE Trans. on Circuits and Systems for Video Technologies, vol. 16, no. 10, pp.1217-1231, Oct. 2006.
21. *Z. Han, G-M. Su, A. Kwasinski, M. Wu and K.J.R. Liu*: "Distortion Management of Real-time MPEG-4 FGS Video Over Downlink Multi-code CDMA Networks", IEEE Trans. on Wireless Communications, vol. 5, no. 11, pp.3056-3067, Nov. 2006.
22. *A. Swaminathan, M. Wu, and K.J.R. Liu*: “Non-intrusive Component Forensics of Visual Sensors Using Output Images,” IEEE Trans. on Info. Forensics and Security, vol. 2, no. 1, pp. 91-106, March 2007.
23. *Y. Mao and M. Wu*: “Tracing Malicious Relay Nodes in Cooperative Wireless Communications,” IEEE Trans. on Info. Forensics and Security, vol. 2, no. 2, pp. 198-212, June 2007.
24. *G-M. Su, Z. Han, M. Wu, and K.J.R. Liu*, “Joint Uplink and Downlink Optimization for Real-Time Multiuser Video Streaming over WLANs,” IEEE Journal of Selected Topics in Signal Processing, Special Issue on Network-Aware Multimedia Proc. & Communications, vol. 1, no. 2, pp. 280-294, August 2007.
25. *Y. Mao and M. Wu*: “Unicity Distance of Robust Image Hashing,” IEEE Trans. on Info. Forensics and Security, vol. 2, no. 3, pp. 462-467, September 2007.
26. *S. He and M. Wu*: “Collusion-Resistant Video Fingerprinting for Large User Group,” IEEE Trans. on Info. Forensics and Security, vol. 2, no. 4, pp. 697-709, December 2007.
27. *S. He and M. Wu*: “Adaptive Detection for Group-based Multimedia Fingerprinting,” IEEE Signal Processing Letters, vol. 14, no. 12, pp.964-967, December 2007.
28. *A. Swaminathan, M. Wu, and K.J.R. Liu*: “Digital Image Forensics via Intrinsic Fingerprints,” IEEE Trans. on Info. Forensics and Security, vol. 3, no. 1, pp.101-117, March 2008.
29. *M. Chen, G-M. Su, and M. Wu*: “Dynamic Resource Allocation for Robust Distributed Multi-Point Video Conferencing,” IEEE Trans. on Multimedia, vol. 10, no. 5, pp. 910-925, August 2008.
30. *S. He, D. Kirovski, and M. Wu*: “High-Fidelity Data Embedding for Image Annotation,” IEEE Trans. on Image Processing, vol. 18, no. 2, pp.429-435, February 2009.
31. *A. Swaminathan, M. Wu, and K.J.R. Liu*: “Component Forensics: Theory, Methodologies, and Applications,” IEEE Signal Processing Magazine, vol. 26, no. 2, pp.28-48, March 2009.

32. *A.L. Varna, S. He, A. Swaminathan, and M. Wu*: “Fingerprinting Compressed Multimedia Signals,” *IEEE Trans. on Info. Forensics and Security*, vol. 4, no. 3, pp. 330-345, September 2009.
33. *H. Gou, A. Swaminathan, and M. Wu*: “Intrinsic Sensor Noise Features for Forensic Analysis on Scanners and Scanned Images,” *IEEE Trans. on Info. Forensics and Security*, vol. 4, no. 3, pp. 476-491, September 2009.
34. *A.L. Varna and M. Wu*: “Modeling and Analysis of Correlated Binary Fingerprints for Content Identification,” *IEEE Trans. on Info. Forensics and Security*, vol. 6, no. 3, pp. 1146-1159, September 2011.
35. *R. Garg, A.L. Varna, and M. Wu*: “An Efficient Gradient Descent Approach for Secure Localization in Resource Constrained Wireless Sensor Networks,” *IEEE Trans. on Info. Forensics and Security*, vol. 7, no. 2, pp. 717-730, April 2012.
36. *M. Stamm, M. Wu, and K.J.R. Liu*: “Information Forensics: An Overview of the First Decade,” invited paper for the inaugural issue, *IEEE Access*, vol. 1, 2013.
37. *A. Hajj-Ahmad, R. Garg, and M. Wu*: “Spectrum Combining for ENF Signal Estimation,” *IEEE Signal Processing Letters*, vol. 20, no. 9, pp. 885-888, September 2013.
38. *R. Garg, A.L. Varna, A. Hajj-Ahmad, and M. Wu*: “ ‘Seeing’ ENF: Power Signature Based Timestamp for Digital Multimedia via Optical Sensing and Signal Processing,” *IEEE Trans. on Info. Forensics and Security*, vol. 8, no. 9, pp. 1417-1432, September 2013.
39. *W-H. Chuang, R. Garg, and M. Wu*: “Anti-Forensics and Countermeasures of Electrical Network Frequency Analysis,” *IEEE Trans. on Info. Forensics and Security*, vol. 8, no. 12, pp.2073-2088, Dec. 2013.
40. *W. Lu, A.L. Varna, and M. Wu*: “Confidentiality-Preserving Image Search: A Comparative Study between Homomorphic Encryption and Distance-Preserving Randomization,” *IEEE Access*, vol. 2, pp. 125-141, 2014.
41. *A. Hajj-Ahmad, R. Garg, and M. Wu*: “ENF-Based Region-of-Recording Identification for Media Signals,” *IEEE Trans. on Info. Forensics and Security*, vol. 10, no. 6, pp. 1125-1136, June 2015.
42. *A. Hajj-Ahmad, A. Berkovich, and M. Wu*: “Exploiting Power Signatures for Camera Forensics,” *IEEE Signal Processing Letters*, vol. 23, no. 5, pp. 713-717, May 2016.
43. *C-W. Wong, G-M. Su, and M. Wu*: “Impact Analysis of Baseband Quantizer on Coding Efficiency for HDR Video,” *IEEE Signal Processing Letters*, vol. 23, no. 10, 2016.
44. *A. Hajj-Ahmad, S. Baudry, B. Chupeau, G. Doërr, and M. Wu*, “Flicker Forensics for Camcorder Piracy,” *IEEE Trans. on Info. Forensics and Security*, vol. 12, no. 1, pp. 89-100, 2017 (published online August 2016).
45. *A. Kazemipour, S. Miran, P. Pal, B. Babadi, and M. Wu*: “Sampling Requirements for Stable Autoregressive Estimation,” *IEEE Trans. on Signal Processing*, vol. 65, no.1, pp. 2333-2347, May 2017.
46. *C-W. Wong and M. Wu*: “Counterfeit Detection Based on Unclonable Feature of Paper Using Mobile Camera,” *IEEE Trans. on Info. Forensics and Security*, vol. 12, no. 8, pp. 1885-1899, August 2017.
47. *A. Kazemipour, M. Wu, and B. Babadi*: “Robust Estimation of Self-Exciting Generalized Linear Models with Application to Neuronal Modeling,” *IEEE Trans. on Signal Processing*, vol. 65, no. 14, pp. 3733-3748, July 2017.

48. *A. Kazemipour*, J. Liu, P. Kanold, **M. Wu**, B. Babadi, “Fast and Stable Signal Deconvolution for Compressible State-Space Models,” *IEEE Trans. on Biomedical Engineering*, online publication April 2017, hard copy at vol. 65, no. 1, pp.74-86, January 2018.
49. *A. Hajj-Ahmad*, *C-W. Wong*, S. Gambino, *Q. Zhu*, M. Yu, and **M. Wu**: “Factors Affecting Capture of ENF Traces in Audio,” *IEEE Trans. on Info. Forensics and Security*, available online since April 2018, formal publication at vol. 14, no.2, pp.277-288, to appear Feb. 2019.
50. L.B. Oliveira, F.M.Q. Pereira, R. Misoczki, D.F. Aranha, F. Borges, M. Nogueira, M. Wingham, **M. Wu**, and J. Liu: “The computer for the 21st century: present security & privacy challenges,” *Journal of Internet Services and Applications*, Springer, December 2018.
51. Q. Xu, Y. Han, B. Wang, **M. Wu**, and K.J.R. Liu: “Indoor Events Monitoring using Channel State Information Time Series,” accepted by *IEEE Internet of Things Journal*, Jan. 2019, to appear.

#### Refereed Articles on Education/Curriculum & Transfer of Research to Educational Outreach

52. **M. Wu** and K.J.R. Liu: “An Interactive and Team Approach to Multimedia Design Curriculum,” in *SP Education Column*, *IEEE Signal Processing Magazine*, pp.14-19, Nov. 2005.
53. **M. Wu**, *A. Hajj-Ahmad*, M. Kirchner, Y. Ren, C. Zhang, and P. Campisi: “Location Signatures that You Don’t See: Highlights from the IEEE Signal Processing Cup 2016 Student Competition,” in *SP Education Column*, *IEEE Signal Processing Magazine*, vol. 33, no. 5, pp. 149-156, Sept. 2016.

#### Manuscripts Under Review or Revision

54. *R. Garg*, *A. Hajj-Ahmad*, and **M. Wu**, “Feasibility Study on Intra-Grid Location Estimation Using Power ENF Signals,” submitted for journal publication, under revision.
55. *H. Su*, **M. Wu**, D. W. Oard, C. Yu, A. Sangwan and J.H.L. Hansen: “Exploiting ENF for Audio Speed Correction,” submitted for journal publication, under revision.
56. F. Zhang, C. Wu, B. Wang, **M. Wu**, D. Bugos, H. Zhang, K.J. Liu: “SMARS: Sleep Monitoring via Ambient Radio Signal,” submitted for journal publication, under review.

#### HIGHLIGHT OF SELECTIVE REFEREED CONFERENCE PAPERS

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1. *Y. Mao*, Y. Sun, **M. Wu**, and K.J.R. Liu: "Dynamic Join-Exit Amortization and Scheduling for Time-Efficient Group Key Agreement", *Proc. of IEEE Infocom '2004*, vol. 4, pp.2617-2627, Hong Kong, March 2004. [Acceptance rate 18.4% out of 1420]
2. *A. Swaminathan*, *Y. Mao* and **M. Wu**: “Security of Feature Extraction in Image Hashing,” *Proc. of IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP'05)*, vol. 2, pp. 1041– 1044, Philadelphia, PA, March 2005. **(Received Student Paper Award)**
3. *A. Swaminathan*, *Y. Mao*, **M. Wu**, and Krishnan Kailas: “Data Hiding in Compiled Program Binaries for Enhancing Computer System Performance,” 7<sup>th</sup> International Information Hiding Workshop (IHW), Barcelona, Spain, and *Lecture Notes in Computer Science (LNCS)*, vol. 3727, pp.357-371, June 2005. [Acceptance rate 31%]
4. *Y. Mao* and **M. Wu**: “Coordinated Sensor Deployment for Improving Secure Communications and Sensing Coverage,” *Proc. of ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN'2005)*, Alexandria, VA, pp.117-128, Nov. 2005. [Acceptance rate 33%]
5. *W-H. Chuang*, *A.L. Varna*, and **M. Wu**, "Modeling and Analysis of Ordinal Ranking in Content Fingerprinting," *Proc. of IEEE Int. Workshop on Information Forensics and Security (WIFS'09)*, pp. 116-120, London, UK, December 2009. [30% acceptance rate]

6. *A.L. Varna* and **M. Wu**, "Modeling Content Fingerprints Using Markov Random Fields", Proc. of IEEE Int. Workshop on Information Forensics and Security (WIFS'09), pp. 111-115, London, UK, December 2009. [30% acceptance rate]
7. *W-H. Chuang* and **M. Wu**, "Semi Non-Intrusive Training for Cell-Phone Camera Model Linkage," Proc. of IEEE Int. Workshop on Information Forensics and Security (WIFS 2010), Seattle, WA, December 2010. [28% acceptance rate for regular paper]
8. *R. Garg, A.L. Varna* and **M. Wu**, "'Seeing' ENF: Natural Time Stamp for Digital Video via Optical Sensing and Signal Processing," long paper accepted by ACM Multimedia, Scottsdale, Arizona, Nov. 2011. [58/338=17% acceptance rate; Top 3 paper; **Best Student Paper Award**]
9. *W-H. Chuang, R. Garg,* and **M. Wu**, "How Secure are Power Network Signature Based Time Stamps?" Proc. of 19<sup>th</sup> ACM Conference on Computer and Communications Security (CCS), Raleigh, NC, Oct. 2012. [81/423=19% acceptance rate for long paper]
10. *R. Garg, A.L. Varna,* and **M. Wu**: "Modeling and Analysis of Electric Network Frequency Signal for Timestamp Verification," Proc. of IEEE Workshop on Info. Forensics and Security (WIFS), Tenerife, Spain, Dec. 2012. [30% acceptance rate for regular paper]
11. *H. Su, A. Hajj-Ahmad,* and **M. Wu**, "Exploiting Rolling Shutter for ENF Signal Extraction From Video," Proc. of IEEE Int. Conf. on Image Processing (ICIP 2014), Paris, France, Oct. 2014. [**Top 10% Paper Award**]
12. **M. Wu**, F.M. Quintão Pereira, J. Liu, H.S. Ramos, M.S. Alvim, and L.B. Oliveira, "New Directions: Proof-Carrying Sensing – Towards Real-World Authentication in Cyber-Physical Systems," Proceedings of ACM Conf. on Embedded Networked Sensor Systems (SenSys), Delft, Netherlands, Nov. 2017. [25% acceptance rate]
13. *M. Chen* and **M. Wu**: "Protect Your Deep Neural Networks from Piracy," IEEE International Workshop on Information Forensics and Security (WIFS), Hong Kong, China, Dec. 2018. [32% acceptance rate]
14. *R. Liu, C-W. Wong,* and **M. Wu**: "Enhanced Geometric Reflection Models for Paper Surfaces," IEEE International Workshop on Information Forensics and Security (WIFS), Hong Kong, China, Dec. 2018. [32% acceptance rate]

#### FULL LIST OF REFEREED CONFERENCE PAPERS

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1. **M. Wu**: "An OCR Approach Based on Peripheral Direction Contributivity and Orthogonal Experimental Analysis", Proc. of 1st Symposium of Undergraduate Research in Science and Technology, pp.44-51, Tsinghua University, Beijing, April 1996 (in Chinese).
2. *X-L. Wu* and **M. Wu**: "An Experimental System of Multi-font Multi-Language Character Recognition", Proc. of National Conf. on Character Recognition and Document Analysis, China, pp.59-66, Sept. 1996 (in Chinese).
3. **M. Wu** and *B. Liu*: "Watermarking for Image Authentication", Proc. of IEEE International Conference on Image Processing (ICIP'98), vol.2, pp.437-441, Chicago, IL, Oct. 1998.
4. **M. Wu**, *W. Wolf,* and *B. Liu*: "An Algorithm for Wipe Detection", Proc. of IEEE International Conference on Image Processing (ICIP'98), vol.1, pp.893-897, Chicago, IL, Oct. 1998.
5. **M. Wu**, *H. Yu,* and *A. Gelman*: "Multi-level Data Hiding for Digital Image and Video", Proceedings of SPIE, vol. 3845, Multimedia Systems and Applications II, pp.10-21, Photonics East Conference, Boston, MA, Sept. 1999.



6. **M. Wu** and B. Liu: "Digital Watermarking Using Shuffling", Proc. of IEEE International Conference on Image Processing (ICIP'99), vol.1, pp.291-295, Kobe, Japan, Oct. 1999.
7. **M. Wu** and B. Liu: "Attacks on Digital Watermarks", Proc. of 33rd Asilomar Conference on Signals, Systems, and Computers, vol.2, pp.1508-1512, Pacific Grove, CA, Oct. 1999.
8. C-Y. Lin, **M. Wu**, J.A. Bloom, M.L. Miller, I.J. Cox, and Y-M. Lui: "Rotation, Scale, and Translation Resilient Public Watermarking for Images," Proc. of SPIE, vol. 3971, Security and Watermarking of Multimedia Contents II, pp.90-98, Electronic Imaging Conferences (EI'00), San Jose, CA, Jan. 2000.
9. **M. Wu**, E. Tang, and B. Liu: "Data Hiding in Binary Image", Proc. of IEEE International Conf. on Multimedia & Expo (ICME'00), vol.1, pp.393-396, New York City, NY, Aug. 2000.
10. **M. Wu** and H. Yu: "Video Access Control via Multi-level Data Hiding", Proc. of IEEE International Conference on Multimedia & Expo (ICME'00), vol.1, pp.381-384, New York City, NY, Aug. 2000.
11. **M. Wu**, R. Joyce, and S-Y. Kung: "Dynamic Resource Allocation via Video Content and Short-term Traffic Statistics", Proc. of IEEE International Conference on Image Processing (ICIP'00), invited paper, vol.3, pp.58-61, Vancouver, Canada, Sept. 2000.
12. P. Yin, **M. Wu**, and B. Liu: "Video Transcoding by Reducing Spatial Resolution", Proc. of IEEE International Conference on Image Processing (ICIP'00), vol.1, pp.972-975, Vancouver, Canada, Sept. 2000.
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  120. *C.-W. Wong, A. Hajj-Ahmad*, and **M. Wu**: “Invisible Geo-Location Signature in a Single Image,” Proc. of IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP), Calgary, Canada, April 2018.
  121. L. Lin, W. Chen, Y. Wang, S. Reinder, **M. Wu**, Y. Guan, and J. Newman: “The Impact of Exposure Settings in Digital Image Forensics,” Proc. of IEEE Int. Conf. on Image Processing (ICIP 2018), Athens, Greece, Oct. 2018.
  122. *Q. Zhu, M. Chen, C.-W. Wong*, and **M. Wu**, “Adaptive Multi-Trace Carving Based on Dynamic Programming”, Asilomar Conference on Signals, Systems and Computers (Asilomar’18), Pacific Grove, CA, Oct. 2018.
  123. W. Chen, L. Lin, **M. Wu**, and J. Newman: “Tackling Android Stego Apps in the Wild,” APSIPA Annual Summit and Conference, Honolulu, HI, Nov. 2018.
  124. *M. Chen* and **M. Wu**: “Protect Your Deep Neural Networks from Piracy,” IEEE International Workshop on Information Forensics and Security (WIFS), Hong Kong, China, Dec. 2018. [32% acceptance rate]
  125. R. Liu, C-W. Wong, and **M. Wu**: “Enhanced Geometric Reflection Models for Paper Surfaces,” IEEE International Workshop on Information Forensics and Security (WIFS), Hong Kong, China, Dec. 2018. [32% acceptance rate]

## PATENTS

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1. J. Bloom, M. Miller, I. Cox, **M. Wu**, C-Y. Lin, and Y-M. Lui: "Rotation, Scale, and Translation



- Resilient Public Watermarking for Images Using a Log-polar Fourier Transform," US Patent 6,282,300, filed Jan. 21, 2000 under # US09489752 and WO2001054331A1, issued Aug. 28, 2001. (Cited by 161 US patents, and 46 patent applications and/or international filings)
2. **M. Wu** and B. Liu: "Watermarking Scheme for Image Authentication," US Patent 6,285,775, filed Oct. 1, 1998, under # US09164474, issued Sept. 4, 2001. (Cited by 217 US patents, and 67 patent applications and/or international filings)
  3. H. Yu, **M. Wu**, X. Li, and A. Gelman: "Methods and Apparatus for Multi-layer Data Hiding," US Patent 6,456,726, filed Oct. 26, 1999, under WO2001031565A1, issued Sept. 24, 2002. (Cited by 90 US patents, and 39 patent applications and/or international filings)
  4. **M. Wu** and H. Yu: "Human Visual Model for Data Hiding," US Patent 6,611,608, filed Oct. 18, 2000, under WO2002033650A1, issued Aug. 26, 2003. (Cited by 38 US patents, and 35 patent applications and/or international filings)
  5. **M. Wu**, R. Joyce, A. Vetro, H-S. Wong, L. Guan, and S-Y. Kung: "Dynamic Network Resource Allocation Using Multimedia Content Features and Traffic Features," US Patent 6,947,378, filed Feb. 28, 2001, under US20020150044A1, issued Sept. 20, 2005. (Cited by 22 US patents, and 37 patent applications and/or international filing)
  6. S. He and **M. Wu**: "Method for fingerprinting multimedia content," U.S. Patent 7,814,564, provisional filing Jan. 2005, formal filing Jan. 2006 under US20070180537A1, issued on Oct. 12, 2010. (Licensed to industry in North and Latin America by UMD; cited by 4 US patents, and 8 patent applications and/or international filing)
  7. **M. Wu** and H. Gou: "Method for concealing data in curves of an image," U.S. Patent 7,817,817, provisional filing Sept. 2004, formal filing Sept. 2005 under US20060056695A1, issued on Oct. 19, 2010. (cited by 11 US patents, and 11 patent applications and/or international filings)
  8. **M. Wu**, A. Swaminathan, and Y. Mao: "Data Hiding in Compiled Program Binaries for Supplementing Computer Functionality," U.S. Patent 7,840,789, provisional filing June 2005, formal filing June 2006 under US20060277530A1, issued on Nov. 23, 2010. (cited by 5 patents, applications or international filings)
  9. R. Garg, A.L. Varna, A. Hajj-Ahmad, and **M. Wu**, "Environmental Signatures for Forensic Analysis and Alignment of Media Recordings," U.S. Patent 9,363,467, filed Nov. 2011 and Nov. 2013 under US20140147097A1, issued June 7, 2016.
  10. **M. Wu**, A. Hajj-Ahmad, and H. Su, "Techniques to Extract ENF Signals from Video Image Sequences Exploiting the Rolling Shutter Mechanism and a New Video Synchronization Approach," U.S. Patent 9,916,857, provisional filed May 2014, formal filing May 2015 under US20150356992A1, issued 13 March 2018.
  11. A. Swaminathan, Y. Mao, G-M. Su, H. Gou, A.L. Varna, S. He, **M. Wu**, and D. Oard, "Confidentiality-Preserving Rank-Ordered Search," filed Oct. 2007 and Dec. 2013, U.S. patent application# US 14/104,652 and US20170235736A1 (cited by 37 patents, patent applications and/or international filings).
  12. **M. Wu** and C-W. Wong, "Counterfeit Detection Scheme Using Paper Surfaces and Mobile Cameras," provisional filed Nov. 2015, formal filing Nov. 2016, U.S. & International patent application# PCT/US2016/061875.
  13. **M. Wu**, C-W. Wong, Q. Zhu, C-H. Fu, and J. Su: "Heart Rate Measurement for Fitness Exercises Using Facial Video," provisional patent filing Sept. 2017, formal filing Sept. 2018.
  14. Q. Zhu, M. Chen, C-W. Wong, and **M. Wu**: "Methods for Tracking Weak Signal Traces Under

Severe Noise and Distortions,” provisional patent filing Sept. 2018.

15. *M. Chen* and **M. Wu**: “Harnessing the Adversarial Behavior of Deep Learning for Access Control, Privacy Protection and Piracy Mitigation,” provisional patent filing Dec. 2018.

#### EDITORIALS AND OTHER CONTRIBUTIONS

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1. **M. Wu**, “Signal Processing Magazine e-Newsletter: Inside Out,” Area Editor’s Editorial, IEEE Signal Processing Magazine, Nov. 2007.
2. **M. Wu**, “A Window to the SP Community,” Area Editor’s Editorial, IEEE Signal Processing Magazine, Sept. 2008.
3. **M. Wu**, “Picturing Signal Processing,” Area Editor’s Editorial, IEEE Signal Processing Magazine, Jan. 2010.
4. **M. Wu**, “Taking up the Torch,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, January 2015.
5. **M. Wu**, “Sharing Signal Processing with the World,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, March 2015.
6. **M. Wu**, “Impact Beyond Numbers,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, May 2015.
7. **M. Wu**, “Art, Engineering, and Community,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, July 2015.
8. **M. Wu**, “Is Signal Processing A New Literacy?” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, September 2015.
9. **M. Wu**, “Engaging Undergraduate Students,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, November 2015.
10. **M. Wu**, “Women in Science, Engineering and Signal Processing,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, January 2016.
11. **M. Wu**, “New Season, New Look,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, March 2016.
12. **M. Wu**, “Silk Road in the New Millennium,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, May 2016.
13. **M. Wu**, “Journey of Learning,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, July 2016.
14. **M. Wu**, “Blurred Boundaries,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, September 2016.
15. **M. Wu**, “Publishing Articles in IEEE Signal Processing Magazine,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, November 2016.
16. **M. Wu**, “Signal Processing: The Expected and the Unexpected,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, January 2017.
17. **M. Wu**, “A Conversation on Signal Processing at Elementary School,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, March 2017.
18. **M. Wu**, “Content Ecosystem: Serving Diverse Interests in Our Community,” Editor-in-Chief’s

Editorial, IEEE Signal Processing Magazine, May 2017.

19. **M. Wu**, “Innovations Powered by Signal Processing,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, July 2017.
20. **M. Wu**, “Camera, Music, and Synergy in Signal Processing,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, September 2017.
21. **M. Wu**, “Signals and Signal Processing: The Invisibles and the Everlastings,” Editor-in-Chief’s Editorial, IEEE Signal Processing Magazine, November 2017.

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RESEARCH  
GRANTS

Overview: Involved as PI/Co-PI in obtaining research and educational funds totalling about \$5.1 million, including from government agencies (NSF, AFOSR, ONR, other DoD offices, NIST, etc.) and industry. Among them, Wu’s share supporting her activities is about \$3.3 million, and the overall amount serving as PI is about \$2.8 million.

1. “I-Corps Team: Mini Signals,” National Science Foundation, \$50K, 2018 – 2019, Principal Investigator and Technical Lead.
2. “StegoDB: An Image Dataset for Benchmarking Steganalysis Algorithms,” NIST – Center for Forensics Excellence, Co-PI (with PI Jennifer Newman and Yong Guan at Iowa State Univ.), 2016 – 2018.
3. “Signal Analytics and Data Science,” Origin Wireless Inc., Research Grants/Gifts, 2018 – 2019, Principal Investigator.
4. “Exploring Power Network Attributes for Information Forensics,” National Science Foundation, \$360K, Sept. 2013 – Aug. 2017, Principal Investigator.
5. “CIF: Small: Toward Trustworthy Information Forensics and Anti-Forensics,” National Science Foundation, \$500K, May 2013 – April 2017, Co-PI (with PI Ray Liu).
6. “Exploring Invisible Traces in Historic Recordings,” Univ. Maryland / NSF ADVANCE Seed Grant, \$20K, May 2013 – April 2014, Principal Investigator (with Co-PI Kari Kraus and Douglas W. Oard).
7. “Forensic Hash for Assured Cyber-based Sensing and Communications”, National Science Foundation, \$344K, Sept. 2010 – Aug. 2014, Principal Investigator.
8. “Information Hiding based Trusted Computing System Design,” Air Force Office of Scientific Research (AFOSR), \$450K, March 2010 – Feb. 2013, Co-PI (with PI Gang Qu).
9. “REU Site: Biosystem Internship for Engineers (BIEN)”, National Science Foundation, \$372K, 2011-2016, Co-PI (with PI Pamela Abshire).
10. “Addressing Physical-Layer Challenges via CLAWS: Cross-Layer Approaches to Wireless Secure Communications”, National Science Foundation, \$312K, Sept. 2008 – Aug. 2012, Principal Investigator.
11. “Digital Image Device Linkage,” Department of Defense, \$195K for UMD subcontract, Feb. 2010 – Jan. 2011, Principal Investigator for UMD effort (with an

industrial partner) and Technical PI for the overall effort.

12. “Non-Intrusive Media Forensics Framework,” Air Force Office of Scientific Research (AFOSR), \$300K, Dec. 2008 – Dec. 2011, Co-PI (with PI Ray Liu).
13. “REU Site: Biosystem Internship for Engineers (BIEN)”, National Science Foundation, \$406K, 2008-2011, Co-PI (with PI Pamela Abshire).
14. “Novel Applications of Data Hiding in Computer Programs for Building High-Performance Trusted Computing Platforms,” Air Force Office of Scientific Research (AFOSR), \$300K, Dec. 2006 – January 2010, Principal Investigator (with Co-PI Gang Qu).
15. “Multimedia Security and Forensics,” Mitsubishi Electric Research Laboratory (MERL), Research Grant/Gift, 2010, Principal Investigator.
16. “Modelling and Analysis of Multimedia Content Fingerprinting,” Motion Picture Laboratory, Research Grant/Gift, 2009, Principal Investigator.
17. “Digital Fingerprinting for Multimedia Security and Forensics”, Office of Naval Research, Young Investigator Program (ONR YIP), \$300K, June 2005 – May 2008, Principal Investigator.
18. “Signal Processing Approaches for Multimedia Security and Information Protection”, National Science Foundation, Faculty Early Career Development Award (CAREER), \$356K, Feb. 2002 – Jan. 2008, Principal Investigator.
19. “Encrypted Domain Search and Processing,” as part of the effort of the Joint Institute of Knowledge Discovery, Department of Defense, my share is \$88K in April 2005 – Dec. 2006, Investigator (with PI V.S. Subrahmanian and other colleagues at UMD).
20. “Data Hiding in Maps: A Modern Way to Protecting Geospatial Information,” Air Force Research Laboratory, \$75K, June 2005 – June 2006, Principal Investigator (with Co-PI Ray Liu).
21. “A Collusion-Resistant Multimedia Fingerprinting Framework for Information Forensics”, Air Force Research Laboratory, Digital Data Embedding Technology program, \$220K, June 2003 – Aug. 2004, Principal Investigator (with Co-PIs Ray Liu, Wade Trappe, and Jane Wang).
22. “Secure and Reliable Communications for Wireless Video,” Minta Martin Foundation, \$55K, June 2002 – May 2003, Principal Investigator.
23. Equipment gift from Sony Corporation for establishing “Sony Theater-Studio” at University of Maryland and supporting multimedia research and education, \$118K, 2004-2005 (with Ray Liu, Carol Espy-Wilson, Steve Marcus, and Nariman Farvardin).
24. Grant from Microsoft Corporation supporting multimedia curriculum development, \$72K, 2003, Principal Investigator (with Co-PI Ray Liu).
25. “REU Site: Undergraduate Research Internships in Telecommunications Engineering”, National Science Foundation, \$1M, 2002-2007, Participating Investigator (with PIs Steve Marcus and Ray Liu at UMD).

EDUCATION  
GRANTS

26. "A Multidisciplinary Integrated Capstone Design Curriculum for Electrical and Computer Engineering", National Science Foundation, Departmental Curriculum Reform Planning Grant, \$100K, 2002-2003, Participating Investigator (with PIs Neil Goldsman and Jon Orloff at UMD).

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RESEARCH  
ADVISING

Overview: Graduated 14 Ph.D's and three M.S. students; advised 27 undergraduate and 3 high school students in research.

- Graduated Ph.D. students
  1. Yinian Mao ("Securing Multi-layer Communications: A Signal Processing Approach", 2006; Job at Qualcomm Research, and now a tech entrepreneur);
  2. Guan-Ming Su ("Dynamic Resource Allocation for Multiuser Video Streaming," 2006; Job at Dolby Labs).
  3. Hongmei Gou ("Digital Forensic Techniques for Graphic Data", 2007; Job at Texas Instrument);
  4. Shan He ("A Joint Coding and Embedding Framework for Multimedia Fingerprinting," 2007; Job at Thomson/Technicolor Corporate Research, and now a patent attorney);
  5. Meng Chen ("Error Control and Concealment of Visual Communications," 2007 – part-time study; Job at PCTEL Inc.);
  6. Ashwin Swaminathan ("Multimedia Forensic Analysis via Intrinsic and Extrinsic Fingerprints," 2008; Job at Qualcomm Research, and now at MagicLeap).
  7. Avinash L. Varna ("Multimedia Protection Using Content and Embedded Fingerprints," 2011; Job at Intel).
  8. Wenjun Lu ("Preserving Trustworthiness and Confidentiality for Online Multimedia," 2011; Job at Google).
  9. Wei-Hong Chuang ("Resiliency Assessment and Enhancement of Intrinsic Fingerprinting," 2012; Job at A9 - Amazon R&D, and now at Google).
  10. Ravi Garg ("Time and Location Forensics for Multimedia," 2013; Job at Intel).
  11. Hui Su ("Temporal and Spatial Alignment of Multimedia Signals," 2014; Job at Google).
  12. Adi Hajj-Ahmad ("Intrinsically Embedded Signatures for Multimedia Forensics," 2016; Job at GE Digital – Data Science).
  13. Chau-Wai Wong ("Micro Signal Extraction and Analytics," 2017; Job at Origin Wireless Inc., and now assistant prof. of North Carolina State Univ.).
  14. Abbas Kazemipour ("Compressed Sensing Beyond the IID and Static Domains: Theory, Algorithms and Applications," 2017, jointly advised with B. Babadi; currently on postdoc training at Stanford Univ.).
- Current Ph.D. students
  15. Qiang Zhu (On micro signal analytics in biomedical applications)
  16. Mingliang Chen (On learning and signal analytics).
  17. Xin Tian (TBA).

- M.S. students  
Y-Q. Li (TBA); Laskshmi Srinivasan (2002); Eda Ormanci (2004); Kenneth Ho (2008, thesis);  
  
Qualified for M.S. by advancing to Ph.D. candidacy: Yinian Mao (2005); Shan He (2005); Hongmei Gou (2006); Ashwin Swaminathan (2006), Avinash L. Varna (2008), Wenjun Lu (2010), Wei-Hong Chuang (2011), Ravi Garg (2012), Hui Su (2013), Adi Hajj-Ahmad (2015), Chau-Wai Wong (2015), Abbas Kazemipour (2016), Qiang Zhu (2018).

CURRICULUM  
DEVELOPMENT

- Co-developed a freshmen-level module-based hands-on course as an introductory to the broad scope of contemporary electrical and computer engineering (ENEE 101); in charge of developing the course material of the module on image/video processing and media security, Academic Years 2015-2019, Univ. of Maryland, College Park.
- Co-developed a new undergraduate capstone design course “ENEE408G Capstone Design on Multimedia Signal Processing” (with K.J. Ray Liu), Academic Year 2001-2002, with substantial updates in 2010-2011, Univ. of Maryland, College Park.  
  
[“An Interactive and Team Approach to Multimedia Design Curriculum,” by M. Wu and K.J.R. Liu, in DSP Education Column, IEEE Signal Processing Magazine, pp.14-19, Nov. 2005]
- Developed a new graduate special topic course “ENEE739M Multimedia Communication & Information Security: A Signal Processing Perspective” (Spring 2002), and an updated version “ENEE739B Multimedia Security and Forensics” (Fall 2005), Univ. of Maryland, College Park.
- Developed a new Capstone course in 2013 for a certificate/executive program on Cyber Security Leadership (BMGT 706), a continuing education program as a collaborative effort of the UMD Business School and Engineering School.

TEACHING  
(AT UMD)

- Undergraduate courses: Hands-on Introduction to ECE (ENEE101), Engineering Probability (ENEE 324); Capstone Design on Multimedia Signal Processing (ENEE 408G).
- Graduate courses: Advanced Digital Signal Processing (ENEE 630/624); Digital Image and Video Processing (ENEE 631); Multimedia Communications (ENEE 739M); Multimedia Security and Forensics (ENEE 739B); Graduate Seminar on Communications and Signal Processing (ENEE 698A).
- Continuous education course: Capstone course on Cyber Security Leadership – information forensics (BMGT 706).

EDUCATIONAL  
& GLOBAL  
OUTREACH

- Lead organizer, IEEE Signal Processing Cup 2016 (a global undergraduate competition on signal processing); the topic was inspired and transferred from our information forensics research on electric power signatures. See article on the competition at the IEEE Signal Processing Magazine, Sept. 2016.

- Volunteer presenter on Science-Technologies-Engineering-Mathematics (STEM) education, for elementary school and high school of the Howard County Public School System, Maryland, USA.

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ELECTED &  
APPOINTED  
POSITIONS IN  
PROFESSIONAL  
SOCIETIES

- Member-at-Large, elected for 2016-2018, Board of Governors, IEEE Signal Processing Society.
- Vice President – Finance, IEEE Signal Processing Society (SPS), elected for 2010-2012. Also a voting member of SPS Executive Committee, Board of Governors, Publication Board, Conference Board, and Membership Board.
- Corresponding Member, Finance Committee of IEEE Technical Activity Board (TAB), 2012.
- Elected Chair (2012-2013), Vice Chair (2011), Secretary (2010) and Member (2008-2011), IEEE Info. Forensics and Security Technical Committee (IFS TC).
- Member, IEEE Ad-Hoc Committee on Women and Under-represented Groups, IEEE Technical Activity Board (2016). Aiming to increase participation from these group, raising awareness on unconscious bias, and fostering mentoring and support network.
- Member, IEEE Fellow Reference Committee, the 1<sup>st</sup> level at IEEE Signal Processing Society (2015-2017); IEEE level review (2019 - ).
- Member, Review Committee for Technical Committees, IEEE Signal Processing Society (2016-2017).
- Member, IEEE Multimedia Signal Processing Technical Committee (MMSP TC), IEEE Signal Processing Society, elected for 2002-2005 and 2007-2010. Chaired conference subcommittee in 2008-2009.
- Member, IEEE Image, Video and Multidimensional Signal Processing Technical Committee (IVMSP/IMDSP TC), elected for 2007-2012.
- Member, IEEE Multimedia Systems and Applications Technical Committee, IEEE Circuits and Systems Society, elected in 2004-2011.
- Founding Chair, IEEE Signal Processing Washington Chapter, since 2006.

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EDITORSHIP

- Editor-in-Chief, *IEEE Signal Processing Magazine* (2015–2017). Led the magazine through a major redesign and brought a steady increase in both citation impact (a popularity metric) and article influence (a prestige metric) to an all-time high. Also served as Past Editor-in-Chief in 2018 to assist the transition and develop content for the magazine issues to be published in 2018 and the first half of 2019.

- Founding Chief Editor, *IEEE SigPort*. Initiating and leading the creation of this effort of online repository and community platform on signal and information processing (2013 – 2014).
- Editorial Board Member, *IEEE Signal Processing Magazine* (2012 – 2014).
- Editorial Board Member, *IEEE Journal of Selected Topics in Signal Processing* (2012 – 2014).
- Area Editor – E-Newsletter, *IEEE Signal Processing Magazine* (2007 – 2010).
- Associate Editor, *IEEE Transaction on Image Processing* (2009 – 2011).
- Associate Editor, *IEEE Transaction on Information Forensics and Security* (2008 – 2011).
- Associate Editor, *IEEE Signal Processing Letters* (2005 – 2007).
- Editorial Board Member, *Journal of the Franklin Institute* (2007 – 2010).
- Editorial Board Member, *Foundations and Trends in Signal Processing* (2006 – present).
- Guest Editor, Special Issue on Digital Forensics, *IEEE Signal Processing Magazine*, published in March 2009.
- Guest Editor, Special Issue on Multimedia Security and Rights Management, *EURASIP Journal on Applied Signal Processing*, published in October 2004.

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CONFERENCE  
ORGANIZER

- Founding Chair of Steering Committee, IEEE ChinaSIP Summit and Conference and IEEE Signal Processing Society Forum on Signal and Data Science (SIDAS), since 2012.
- General Co-Chair, 2017 IEEE International Conference on Image Processing (ICIP 2017, Beijing, China).
- Technical Program Co-Chair, 2013 IEEE International Conference on Image Processing (ICIP 2013, Melbourne, Australia).
- Special Session Co-Chair, 2010 IEEE International Workshop on Multimedia Signal Processing (MMSP 2010, Saint Malo, France).
- Finance Chair, 2007 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'07, Hawaii).
- Publicity Chair, 2003 IEEE International Conference on Multimedia & Expo (ICME'03, Baltimore).
- Organizer or Co-Organizer of Special Technical Sessions in conferences:
  - “Multimedia Security and Rights Management,” IEEE Inter. Conf. on Acoustics, Speech, and Signal Processing (ICASSP'03, Hong Kong).



“Multimedia Security Issues in Streaming and Mobile Applications,” IEEE Inter. Conf. on Image Processing (ICIP'04, Singapore).

“Multimedia Security and Forensics,” Conference on Information Sciences and Systems (CISS'06, Princeton).

- Served on the Technical Program Committee for conferences:
  - IEEE Int'l Conf. on Acoustics, Speech, & Signal Processing (ICASSP 2002-2018)
  - IEEE Int'l Conf. on Image Processing (ICIP 2004-2016)
  - IEEE Int'l Conf. on Multimedia & Expo (ICME 2002-2011)
  - IEEE Workshop on Multimedia Signal Processing (MMSP 2002-2011)
  - IEEE Workshop on Info. Forensics and Security (WIFS'09-'14)
  - IEEE Int'l Symposium on Circuits and Systems (ISCAS '04, '06-'07)
  - IEEE Globecom Conference (2006-07)
  - IEEE Int'l Conf. on Communications (ICC '03-'05)
  - IEEE Conf. on Info. Technology: Research & Education (ITRE'03)
  
  - ACM Information Hiding & Multimedia Security (IH&MMsec 2013)
  - ACM Multimedia Conference (2002, 2011-2012)
  - ACM Workshop on Multimedia Security (2006-2012)
  - ACM Workshop on Digital Rights Management (2009)
  - SPIE Conf. on Security, Watermarking and Steganography (2005-2013)
  - International Workshop on Digital Watermarking (IWDW '02-'07, '11)

REVIEWER

- NSF Panelist and Reviewer for Computer and Info. Science and Engineering Directorate: Signal Processing Systems; Western Europe; Cyber Trust/SaTC; and Foundations for Computing and Communications; Cyber Physical Systems; etc..
- Reviewer for AAAS on multiple U.S. and international research programs.
- Proposal Reviewer for funding agencies of U.S. government, Europe, and Asia.
- Reviewer, International Assessment, School of Electronic Engineering, Beijing Institute of Technology, 2017.
- Reviewer for IEEE Transactions on: (1) Multimedia; (2) Image Processing; (3) Signal Processing; (4) Signal Processing Letters; (5) Circuits & Systems for Video Technologies; (6) Communications; (7) Communication Letters; (8) Secure and Dependable Computing; (9) Neural Network; (10) System, Man, and Cybernetics; (11) Knowledge and Data Engineering; (12) Speech and Audio Processing; (13) Signal Processing Magazine; (14) Information Forensics and Security; (15) Pattern Analysis and Machine Intelligence; and more.
- Reviewer for International Journals: (1) IEE Journals on Vision, Image, and Signal Processing; (2) SPIE Journals of Optical Engineering; (3) Journal of VLSI Signal Processing; (4) Journal on Real-Time Imaging; (5) EURASIP Journal on Applied Signal Processing; (6) Journal of Visual Communication and Image Representation; (7) Journal of New Music Research; (8) IEE Journal on Information Security; and more.

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UNIVERSITY  
SERVICE

- 2007-present Faculty advisor, Women in ECE (WECE) program, UMD.
- 2018-2019 ECE Undergraduate Affair Committee, UMD.
- 2017-2018 CS Faculty Search Committee, UMD.
- 2017-2018 UMIACS Appointment, Promotion and Tenure Committee, UMD.
- 2017 ECE Strategic Planning Committee, UMD.
- 2015-2016 Promotion and Tenure Appeal Committee (university-level), UMD.
- 2015-2016 Chair, ECE Appointment, Promotion and Tenure Committee, UMD.
- 2014-2015 ADVANCE Professor (for Engineering and iSchool) and Campus ADVANCE Committee, UMD.
- 2014-2015 Selection Committee for Univ. Distinguished Scholar-Teacher, UMD.
- 2012-2013 Chair, ECE Faculty Search Committee, UMD.
- 2013-2014 ECE Facilities Committee, UMD.
- 2012-2014 and 2015-2017 UMIACS Steering Committee, UMD.
- 2012-2014 & 2003-2007 ECE Human Relations & Welfare Committee, UMD.
- 2011-2012 & 2005-2006 ECE Faculty Search Committee, UMD.
- 2010-2012 & 2003-2007 ECE Graduate Studies and Research Committee, UMD.
- 2010-2012 ECE Representative, Engineering College Research Committee, UMD.
- 2008-2010 Engineering College Council, UMD.
- 2009-2010 ECE Departmental Review Committee, UMD.
- 2004-2008 Faculty mentor for the new undergraduate “Inventis” honor program, College of Engineering, UMD.
- 2007-2008 University Advisory Committee on International Affairs and Activities with China, UMD.
- 2005-2007 ECE Department Council, UMD.
- 2005-2007 ECE Annual Review Committee, UMD.
- 2003-2005 ECE Undergraduate Affair Committee, UMD.
- 2002-2003 Area representative assisting ECE graduate admission, UMD.
- 2001-2011 Lab tours on “Multimedia in a Nutshell” introducing state-of-the-art multimedia research and education at UMD to visitors, prospective students, and the general public.
- Search Committee for various ECE staff positions, UMD.

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Last updated: January 2019