

CURRICULUM VITAE

Lin Ma, Ph.D

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Summary

- Ph.D. in Electronic Engineering; The Chinese University of Hong Kong
- Expertise in image/video perception quality assessment, deep learning, and multimodal learning.
- Good track record of publications in peer-refereed journals and conferences. Google Scholar citations: 359.
- Proficiency in technology disclosure writing, patent writing, and application, with two US patents and one Chinese patent granted and several patents in application.

Academic Qualifications

Ph.D. Aug. 2009-Dec.2013

- Department of Electronic Engineering, The Chinese University of Hong Kong
- Supervisor: Prof. King Ngai Ngan
- GPA: 3.668/4.0

M.Eng. Sep.2006-Jul.2008

- School of Computer Science and Technology, Harbin Institute of Technology
- Supervisor: Prof. Wen Gao
- GPA: 8/184 (top 5%)

B. Eng. Sep.2002-Jul.2006

- School of Computer Science and Technology, Harbin Institute of Technology
- GPA: 7/200 (top 4%)

Experiences

Researcher **Huawei Noah's Ark Lab, Hong Kong**

Aug. 2013–Present **Research on deep learning and multimodal learning**

- Multimodal convolutional neural network for matching image and sentence, which achieves the best performances on bi-directional image and sentence retrieval.
- Image question answering based on convolutional neural network, which achieves the best performance on the image question answering problem.
- Multimodal auto-encoder for face emotion recognition considering the texture and landmark modalities.
- Filed 1 PCT patent and 4 Chinese patents, published 3 journal papers and 5+ conference papers.

Staff Researcher **Lenovo Image and Visual Computing Lab, Hong Kong**

Aug. 2012–Jul. 2013 **Research on image processing, restoration, and quality assessment**

- Propose to restore the high quality artifact-free image from multiple low quality images.
- Investigate how different shape descriptors evaluate the perceptual quality of the retargeted image.
- Proposed packet-layer model with content characteristics for video quality assessment of IPTV.
- Filed 1 US patent and 3 Chinese patents and published 3 conference papers.

Ph.D Candidate **Department of Electronic Engineering, the Chinese University of Hong Kong, Hong Kong**
Aug. 2009-Dec. 2013 **Research on Image/Video Processing and Compression**

- Conduct researches on video compression by modeling the human visual system (HVS) just-noticeable difference (JND).
- Research on statistical property of the DCT coefficient distribution and temporal statistical property.
- Research on image/video full-reference and reduced-reference quality metrics.
- Conduct researches on consistent visual quality control for video coding.
- Research on image coding through adaptive block-based super-resolution directed down-sampling.
- Filed 1 US patent and 1 Chinese patent, published 20+ academic papers.

Visiting Student **School of Computer Engineering, Nanyang Technological University, Singapore**
Jul. 2011-Sep. 2011 **Research on Image Retargeting Process and Quality Assessment**

- Investigate on different image retargeting algorithms, such as seam carving, warping, shift-map, and so on.
- Design a psycho-visual experiment for large-scale subjective evaluation on the perceptual qualities of the retargeted images.
- Build an image retargeting quality database publicly for research communities.
- Published 1 journal paper and 2 conference papers.

Research Assistant **Department of Electronic Engineering, the Chinese University of Hong Kong, Hong Kong**
Nov. 2008-Jul. 2009 **Research on ITF project "Interesting Object Recognition System"**

- Data collection for labeling and testing.
- Feature extraction, and clustering for representing the buildings in the image.

Research Intern **Internet Media Group, Microsoft Research Asia, Beijing, China**
Oct. 2007-Mar. 2008 **Research on image super-resolution and post-processing**

- Research on the learning-based image super-resolution through a three-tiered network model.
- Develop an image post-processing method for JPEG coded images through local filtering, Markov-chain learning, and quantization constraint regularization.
- Filed 1 US patent and published 1 journal paper and 2 conference papers. One conference paper won the **Best Paper Award** on PCM 2008.

M.Eng. Candidate **School of Computer Science and Technology, Harbin Institute of Technology, China**
Sep. 2006-Jul. 2008 **Research on AVS video coding standards and image steganalysis method**

- Research on Intra prediction for AVS (Audio Video Standard).
- Incorporate wavelet transform in intra frame coding of AVS (Audio Video Standard) to ensure spatial scalability.
- Develop a universal image steganalysis method by statistical feature extraction and SVM classification.
- Proposed 2 technical proposals to AVS, published 1 conference paper.

Publications

Books

- 1 Chenwei Deng, **Lin Ma**, Weisi Lin, and King Ngai Ngan, "Visual Signal Quality Assessment - Quality of Experience (QoE)", Springer, ISBN: 978-3-319-10367-9, 303 pages, Nov. 2014. [Year 2014 Chapter downloads: 354]

Book Chapters

- 1 **Lin Ma**, Chenwei Deng, Weisi Lin, King Ngi Ngan, and Long Xu, "Retargeted Image Quality Assessment: Current Progresses and Future Trends", in *Visual Signal Quality Assessment - Quality of Experience (QoE)*, Springer, ISBN: 978-3-319-10367-9, pp. 213-242, Nov. 2014.
- 2 Chenwei Deng, Shuigen Wang, and **Lin Ma**, "Conclusions and Perspectives", in *Visual Signal Quality Assessment - Quality of Experience (QoE)*, Springer, ISBN: 978-3-319-10367-9, pp. 287-302, Nov. 2014.

Journal

- 1 **Lin Ma**, Songnan Li, Fan Zhang, and King Ngi Ngan, "Reduced-Reference Image Quality Assessment Using Reorganized DCT-Based Image Representation", *IEEE Transaction on Multimedia*, vol. 13, no. 4, pp. 824-829, Aug. 2011. [Google Scholar Citations: 57]
- 2 **Lin Ma**, Songnan Li, and King Ngi Ngan, "Reduced-Reference Video Quality Assessment of Compressed Video Sequences", *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 22, no. 10, pp. 1441-1456, Oct. 2012. [Google Scholar Citations: 16]
- 3 **Lin Ma**, Weisi Lin, Chenwei Deng, and King Ngi Ngan, "Image Retargeting Quality Assessment: A Study of Subjective Scores and Objective Metrics", *IEEE Journal of Selected Topics in Signal Processing*, vol. 6, no. 6, pp. 626-639, Oct. 2012. [Google Scholar Citations: 27]
- 4 Songnan Li, **Lin Ma**, and King Ngi Ngan, "Full-reference Video Quality Assessment by Decoupling Detail Losses and Additive Impairments", *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 22, no. 7, pp. 1100-1112, Jul. 2012. [Google Scholar Citations: 26]
- 5 Songnan Li, Fan Zhang, **Lin Ma**, and King Ngi Ngan, "Image Quality Assessment by Separately Evaluating Detail Losses and Additive Impairments", *IEEE Transaction on Multimedia*, vol. 13, no. 5, pp. 935-949, Oct. 2011. [Google Scholar Citations: 29]
- 6 Fan Zhang, **Lin Ma**, Songnan Li, and King Ngi Ngan, "Practical Image Quality Metric Applied to Image Coding", *IEEE Transaction on Multimedia*, vol. 13, no. 4, pp. 615-624, Aug. 2011. [Google Scholar Citations: 17]
- 7 **Lin Ma**, Xu Wang, Qiong Liu, and King Ngi Ngan, "Reorganized DCT-based Image Representation for Reduced Reference Stereoscopic Image Quality Assessment", *Neurocomputing*. [Accepted].
- 8 Wei Zhang, Youmei Zhang, **Lin Ma (corresponding author)**, Jingwei Guan, and Shijie Gong, "Multimodal Learning For Facial Expression Recognition", *Pattern Recognition*, vol. 48, no. 10, pp. 3191-3202, Oct. 2015.
- 9 **Lin Ma**, Songnan Li, and King Ngi Ngan, "Reduced-Reference Image Quality Assessment in Reorganized DCT Domain", *Signal Processing: Image Communication*, vol. 28, no. 8, pp. 884-902, Aug. 2013. [Google Scholar Citations: 16]
- 10 **Lin Ma**, King Ngi Ngan, Fan Zhang, and Songnan Li, "Adaptive Block-Size Transform Based Just-Noticeable Difference Model for Images/Videos", *Signal Processing: Image Communication*, vol. 26, no. 3, pp. 162-174, Mar. 2011. [Google Scholar Citations: 12]
- 11 **Lin Ma**, Debin Zhao, and Wen Gao, "Learning-based Image Restoration for Compressed Images", *Signal Processing: Image Communication*, vol. 27, no. 1, pp. 54-65, Jan. 2012. [Google Scholar Citations: 7]
- 12 Long Xu, Songnan Li, King Ngi Ngan, and **Lin Ma**, "Consistent Visual Quality Control in Video Coding", *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 23, no. 6, pp. 975-989, Jun. 2013. [Google Scholar Citations: 3]
- 13 **Lin Ma**, Songnan Li, and King Ngi Ngan, "Visual Horizontal Effect for Image Quality Assessment", *IEEE Signal Processing Letters*, vol. 17, no. 7, pp. 627-630, Jul. 2010. [Google Scholar Citations: 24]
- 14 Songnan Li, **Lin Ma**, and King Ngi Ngan, "Anaglyph Image Generation by Matching Color Appearance Attributes", *Signal Processing: Image Communication*, vol. 28, no. 6, pp. 597-607, Jul. 2013. [Google Scholar Citations: 7]
- 15 Yaqing Niu, Matthew Kyan, **Lin Ma**, Azeddine Beghdadi, and Sridhar Krishnan, "Visual Saliency's Modulatory Effect on Just Noticeable Distortion Profile and Its Application in Image Watermarking", *Signal Processing: Image Communication*, vol. 28,

no. 8, pp. 917-928, Aug. 2013. [Google Scholar Citations: 6]

- 16 Zhuo Chen, **Lin Ma**, Long Xu, Chengming Tan, and Yihua Yan, "Imaging and Representation Learning of Solar Radio Spectrums for Classification", *Multimedia Tools and Applications*. [Accepted]
- 17 **Lin Ma**, Chenwei Deng, King Ngi Ngan, and Weisi Lin, "Recent Advances and Challenges of Visual Signal Quality Assessment", *China Communications*, vol. 10, no. 5, pp. 62-78, 2013. [Google Scholar Citations: 8]

Conference

- 1 **Lin Ma**, Zhengdong Lu, Lifeng Shang, and Hang Li, "Multimodal Convolutional Neural Networks for Matching Image and Sentence", *International Conference on Computer Vision (ICCV 2015)*, Santiago, Chile, Dec. 11-18, 2015.
- 2 **Lin Ma**, Zhengdong Lu, and Hang Li, "Learning to Answer Questions From Image using Convolutional Neural Network", *The 30th AAAI Conference on Artificial Intelligence (AAAI 2016)*, Phoenix, Arizona, USA, Feb. 12-17, 2016..
- 3 **Lin Ma**, Feng Wu, Debin Zhao, Wen Gao, and Siwei Ma, "Learning-based Image Restoration for Compressed Image through Neighboring Embedding", (**Best Paper Award**) *Pacific-Rim Conference on Multimedia (PCM 2008)*, Tainan, Taiwan, Dec. 9-13, 2008.
- 4 **Lin Ma**, Songnan Li, and King Ngi Ngan, "Motion Trajectory Based Visual Saliency for Video Quality Assessment", *International Conference on Image Processing (ICIP 2011)*, Brussels, Belgium, Sep. 11-14, 2011.
- 5 **Lin Ma**, Fan Zhang, Songnan Li, and King Ngi Ngan, "Video Quality Assessment Based on Adaptive Block-Size Transform Just-Noticeable Difference Model", *International Conference on Image Processing (ICIP 2010)*, Hong Kong, China, Sep. 26-29, 2010.
- 6 **Lin Ma**, Yonghua Zhang, Yan Lu, Feng Wu, and Debin Zhao, "Three-tiered Network Model for Image Hallucination", *International Conference of Image Processing (ICIP 2008)*, San Diego, California, USA, Oct. 12-15, 2008.
- 7 **Lin Ma**, King Ngi Ngan, and Long Xu, "Reduced Reference Video Quality Assessment Based on Spatial HVS Mutual Masking and Temporal Motion Estimation", *IEEE International Conference on Multimedia and Expo (ICME 2013) in Multimedia for Humanity Theme Track*, San Jose, California, USA, Jul. 15-19, 2013.
- 8 **Lin Ma**, Long Xu, Huanqiang Zeng, King Ngi Ngan, and Chenwei Deng, "How Does the Shape Descriptor Measure the Perceptual Quality of the Retargeted Image?" *IEEE International Conference on Multimedia and Expo (ICME 2014) Workshop on Emerging Multimedia Systems and Applications*, Chengdu, Sichuan, China, Jul. 14-18, 2014.
- 9 **Lin Ma**, Chenwei Deng, Weisi Lin, and King Ngi Ngan, "Overview of Quality Assessment for Visual Signals and Newly Emerged Trends", *International Symposium on Circuits and Systems (ISCAS 2013)*, Beijing, China, May 19-23, 2013.
- 10 **Lin Ma**, Weisi Lin, Chenwei Deng, and King Ngi Ngan, "Study of Subjective and Objective Quality Assessment of Retargeted Images", *International Symposium on Circuits and Systems (ISCAS 2012)*, Seoul, Korea, May 20-23, 2012.
- 11 **Lin Ma**, Songnan Li, and King Ngi Ngan, "Perceptual Image Compression via Adaptive Block-Based Super-Resolution Directed Down-Sampling", *International Symposium on Circuits and Systems (ISCAS 2011)*, Rio de Janeiro, Brazil, May 15-18, 2011.
- 12 **Lin Ma**, and King Ngi Ngan, "Adaptive Block-Size Transform Based Just-Noticeable Difference Profile for Videos", *International Symposium on Circuits and Systems (ISCAS 2010)*, Paris, France, May 30 – Jun. 2, 2010.
- 13 **Lin Ma**, and King Ngi Ngan, "Adaptive Block-Size Transform Based Just-Noticeable Difference Profile for Images", *Pacific-Rim Conference on Multimedia (PCM 2009)*, Bangkok, Thailand, Dec. 15-18, 2009.
- 14 **Lin Ma**, Long Xu, Qian Zhang, and King Ngi Ngan, "High Quality Image Construction from Multiple Low Quality Copies", *International Workshop on Multimedia Signal Processing (MMSP 2013)*, Pula (Sardinia), Italy, Sep. 30-Oct. 2, 2013.
- 15 **Lin Ma**, Long Xu, Yichi Zhang, King Ngi Ngan, Yihua Yan, "Rank Learning Based No-Reference Quality Assessment of Retargeted Images", *IEEE International Conference on Systems, Man, and Cybernetics (SMC 2015)*, Hong Kong, Oct. 9-12, 2015.
- 16 **Lin Ma**, Songnan Li, and King Ngi Ngan, "Reduced-Reference Image Quality Assessment via Intra- and Inter-Subband

- Statistical Characteristics in Reorganized DCT Domain", *Asia Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC 2011)*, Xi'an, China, Oct. 18-21, 2011.
- 17 Qian Zhang, **Lin Ma**, Fan Zhang, and Long Xu, "A Packet-Layer Model with Content Characteristics for Video Quality Assessment of IPTV", *Pacific-Rim Conference on Multimedia (PCM 2015)*, Gwangju, Korea, Sep. 16-18, 2015.
 - 18 Long Xu, **Lin Ma**, Zhuo Chen, Yihua Yan, and Qian Zhang, "Perceptual Quality Improvement for Synthesis Imaging of Chinese Spectral Radioholograph ", *Pacific-Rim Conference on Multimedia (PCM 2015)*, Gwangju, Korea, Sep. 16-18, 2015.
 - 19 Zhuo Chen, **Lin Ma**, Long Xu, Yihua Yan, "Multimodal Learning for Classification of Solar Radio Spectrum", *IEEE International Conference on Systems, Man, and Cybernetics (SMC 2015)*, Hong Kong, Oct. 9-12, 2015.
 - 20 Long Xu, Jia Li, Weisi Lin, Yongbing Zhang, **Lin Ma**, Yuming Fang, Yun Zhang, and Yihua Yan, "Multi-task Rank Learning for Image Quality Assessment", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2015)*, Brisbane, Australia, Apr. 19-24, 2015.
 - 21 Long Xu, **Lin Ma**, King Ngi Ngan, Weisi Lin, and Ying Weng, "Visual Quality Metric for Perceptual Video Coding", *IEEE Visual Communications and Image Processing (VCIP 2013)*, Charming City of Kuching, Sarawak, Malaysia, Nov. 17-20, 2013.
 - 22 Qian Zhang, Fan Zhang, and **Lin Ma**, "Packet-layer Model for Quality Assessment of Encrypted Video in IPTV Services", *Asia Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC 2013)*, Kaohsiung, Taiwan, Oct. 29 - Nov. 1, 2013.
 - 23 Long Xu, King Ngi Ngan, Songnan Li, and **Lin Ma**, "Video Quality Metric for Consistent Visual Quality Control in Video Coding", *Asia Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC 2012)*, Hollywood, California, USA, Dec. 3-6, 2012.
 - 24 Songnan Li, **Lin Ma**, and King Ngi Ngan, "Video Quality Assessment by Decoupling Additive Impairments and Detail losses", *International Workshop on Quality of Multimedia Experience(QoMEX 2011)*, Mechelen, Belgium, Sep. 7-9, 2011.
 - 25 Yaqing Niu, Matthew Kyan, **Lin Ma**, Azeddine Beghdadi, and Sridhar Krishnan, "A Visual Saliency Modulated Just Noticeable Distortion Profile for Image Watermarking", *European Signal Processing Conference (EUSIPCO 2011)*, Barcelona, Spain, Aug. 29 - Sep. 2, 2011.
 - 26 Songnan Li, **Lin Ma**, Fan Zhang, and King Ngi Ngan, "Temporal Inconsistency Measure for Video Quality Assessment", *Picture Coding Symposium (PCS 2010)*, Nagoya, Japan, Dec. 7-10, 2010.
 - 27 Fan Zhang, Songnan Li, **Lin Ma**, and King Ngi Ngan, "Limitation and Challenges of Image Quality Measurement", *Visual Communications and Image Processing (VCIP 2010)*, Huang Shan, Anhui, China, Jul. 11-14, 2010.
 - 28 Shaohui Liu, **Lin Ma**, Hongxun Yao, and Debin Zhao, "Universal Steganalysis Based on Statistical Models Using Reorganization of Block-based DCT Coefficients", *International Conference on Information Assurance and Security (IAS 2009)*, Xi'an, China, Aug. 18-20, 2009.

Patents

- 1 King Ngi Ngan, **Lin Ma**, Wai Kuen Cham, and Yu Liu, "Method and Apparatus for Video Coding By ABT-based Just Noticeable Difference Model", US Non-Provisional Patent Application No. 12/750,401. Mar. 2010.
- 2 King Ngi Ngan, **Lin Ma**, Wai Kuen Cham, and Yu Liu, "Method and Apparatus for Video Coding By ABT-based Just Noticeable Difference Model", (Chinese Patent) Application No. 201010174145.5, Apr. 2010.
- 3 Yonghua Zhang, **Lin Ma**, Feng Wu, "Image Upsampling with Training Images", US Non-Provisional Patent Application No. 12/234,572. Sep. 2008
- 4 **Lin Ma**, Qiang Liu, "Image Processing Method and Electronic Device", US Non-Provisional Patent Application No. 14/227,696. Mar. 2014.
- 5 **Lin Ma**, Qiang Liu, "Image Processing Method and Electronic Device", (Chinese Patent) Application No. CN201310347604.9, Aug. 2013.

- 6 **Lin Ma**, Qiang Liu, "Information Processing Method and Electronic Device", (Chinese Patent) Application No. CN201310392941.X, Sep. 2013.
- 7 Qiang Liu, **Lin Ma**, "Image Processing Method and Electronic Device", (Chinese Patent) Application No. CN201410253183.8, Jun. 2014.
- 8 **Lin Ma**, Yan Feng, Linlin Wang, and Weibin Zhang, "One Method and Device for Text Conversion", (Chinese Patent) Application No. 201510422682.X, Jul. 2015.
- 9 **Lin Ma**, Weibin Zhang, and Yan Feng, "One Method and Device for Text Conversion", (Chinese Patent) Application No. 201510017057.7, Jan. 2015.
- 10 **Lin Ma**, Kai Liu, and Hao Xiong, "One Method, Device, and System for Semantic Consistency Evaluation", (Chinese Patent) Application No. 201510003802.2, Jan. 2015.
- 11 **Lin Ma**, Zhiyang Teng, and Hao Xiong, "One Method and Device for Machine Translation", (Chinese Patent) Application No. 201410192917.6, May. 2014.
- 12 **Lin Ma**, Zhiyang Teng, and Hao Xiong, "One Method and Device for Machine Translation", (PCT Patent) Application No. PCT/CN2014/094507, Dec. 2014.

Teaching

| | |
|---|-----------------|
| Digital Image Processing | Term 2, 2010-11 |
| Principles of Communication Systems | Term 1, 2010-11 |
| Advanced Digital Signal Processing and Applications | Term 2, 2009-10 |
| Principles of Communication Systems | Term 1, 2009-10 |

Awards

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|---|------------------|
| Excellent new employee of Huawei | Year 2014 |
| Finalist to the HKIS Young Scientist Award in Engineering Science | Year 2012 |
| PCCW Foundation Scholarship | Year 2012 |
| Microsoft Research Asia Fellowship | Year 2011 |
| Graduate studentship, The Chinese University of Hong Kong | Year 2009 – 2012 |
| Best paper award of Pacific-Rim Conference on Multimedia (PCM) 2008 | Year 2008 |
| Excellent master graduate of Harbin Institute of Technology | Year 2008 |
| First-class postgraduate scholarship for two successive years | Year 2006 – 2008 |
| Heqinkeji scholarship | Year 2004 |

Professional Activities

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| Memberships | IEEE (S'09-M'13) |
| Technical Committee | IEEE SMC TC on Human Perception Multimedia Computing (HPMC) European Workshop on Visual Information Processing (EUVIP 2014) IEEE International Conference on Multimedia Big Data (BigMM 2015) workshop on Multimedia Big Data Compression |
| Special Session Organizer | IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC 2015) Special Session on "Multimedia Perceptual Quality Assessment" International Symposium on Circuits and Systems (ISCAS 2013) Special Session on "Perception-based multimedia quality of experience (QoE) evaluation" |

Journal Reviewer

IEEE Transactions on Image Processing
IEEE Transactions on Circuits and Systems for Video Technology
IEEE Transactions on Information Forensics and Security
IEEE Transactions on Multimedia
IEEE Transactions on Broadcasting
IEEE Journal of Selected Topics in Signal Processing
IEEE Signal Processing Letters
Elsevier Signal Processing
Elsevier Signal Processing: Image Communication
Elsevier Journal of Visual Communication and Image Representation
Elsevier Digital Signal Processing
Springer Multimedia Tools and Applications
Journal of Zhejiang University Science C (Computers & Electronics)
Computer Communication & Collaboration

Conference Reviewer

International Symposium on Circuits and Systems (ISCAS 2016)
International Symposium on Circuits and Systems (ISCAS 2015)
IEEE International Conference on Visual Communications and Image Processing (IEEE VCIP 2015)
International Conference on Systems, Man, and Cybernetics (IEEE SMC 2015)
IEEE International Conference on Multimedia Big Data (IEEE BigMM 2015) workshop on Multimedia Big Data Compression
International Symposium on Circuits and Systems (ISCAS 2014)
European Workshop on Visual Information Processing (EUVIP 2014)
IEEE International Conference on Multimedia and Expo (ICME 2014) workshop on Emerging Multimedia Systems and Applications
International Symposium on Circuits and Systems (ISCAS 2013)
IEEE International Conference on Multimedia and Expo (ICME 2012)