JONGYOO KIM

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RESEARCH INTEREST

◇ Perceptual image/video quality assessment ◇ Quality of experience of 2D/3D/VR contents
◇ Video object segmentation ◇ Deep learning ◇ 3D reconstruction

EDUCATION

Yonsei University, Seoul, Korea *Mar 2011 – Feb 2018; expected*
Combined M.S. and Ph.D. in Electrical and Electronic Engineering
Supervised by Prof. Sanghoon Lee
GPA: 4.03/4.30

Yonsei University, Seoul, Korea *Mar 2007 – Feb 2011*
B.S. in Electrical and Electronic Engineering
GPA: 3.67/4.30

EXPERIENCE

Microsoft Research Asia Aug 2017 – Present
Research Intern *Beijing, China*

· Developed an algorithm of unsupervised video object segmentation, which aims to obtain accurate salient object segmentation and track over frames.
· Implemented the software using TensorFlow.

IEEE Human Factors for Visual Experiences Working Group Jul 2015 – Present
Secretary *Seoul, Korea*

· Organized regular working group meetings, and handled standardization processes of the developing projects (P3333.1.2 and P3333.1.3).
· Submitted technical contributions regarding visual sharpness measurement, and deep learning-based perceptual image quality assessment.

Yonsei University Mar 2011 – Dec 2011
Teaching assistant *Seoul, Korea*

· Data Structure, Engineering Information Processing.

RESEARCH PROJECTS

Institute for Information & Communications Technology Promotion Apr 2017 – Present
Development of a Method for Regulating Human-factor Parameters to Reduce VR-induced Sickness

· Analyzed the physiological and device-relevant factors of causing visual discomfort of VR Contents.
· Analyzed the statistical relationship between bio signals and content features.
· Generated VR stimuli for subjective experiments.

National Research Foundation of Korea Jul 2016 – Present
A VR Emotion Study Based on Visual Perception and Artificial Intelligence

· Researched deep learning-based perceptual image quality assessment.
· Submitted a journal paper to *IEEE Transactions on NeuralNetworks and Learning Systems.*

· Implemented the software using Python and Theano.

Samsung Electronics Jun 2015 – Aug 2017
Research on Video Coding Scheme by Predicting Quality Processing

· Developed a perceptual video quality assessment algorithm which considered natural video statistics and temporal sharpness variation.
· Developed a deep learning-based perceptual video quality assessment algorithm which measures the local quality as well as global quality of videos.
· Implemented the software using Matlab, Python and TensorFlow.
· Submitted a patent.

Electronics and Telecommunications Research Institute Mar 2015 – Feb 2016
Research on Feature Extraction and DB Construction for Image-based Indoor Localization

· Implemented a core software of indoor image-based localization, which includes feature point extraction (multi thread), matching, Levenberg-Marquardt optimization-based localization, and interactive visualization.
· Implemented the software using C++ and openCV, Hessian matrices (for optimization) were obtained using Matlab, the visualization interface was implemented using openGL.

Institute for Information & Communications Technology Promotion Apr 2014 – Feb 2017
Research on Human Safety and Contents Quality Assessment for Realistic Broadcasting

· Constructed a database for visual discomfort assessment of 3D stereoscopic images and videos (Shot sequences and conducted subjective experiments).
· Developed a perceptual crosstalk prediction method of auto-stereoscopic displays by considering masking phenomena and binocular processing of human visual system.
· Implemented the software using Matlab.
· Submitted a conference paper and a journal paper.

Institute for Information & Communications Technology Promotion May 2013 – Feb 2017
Development of ODM-interactive Software Technology supporting Live-Virtual Soldier Exercises

· Implemented a real-time 360-degree human skeleton fusion system using six Microsoft Kinects.
· Researched a real-time human action recognition algorithm using variable length Markov random field and particle filter.
· Implemented the software using C++ with openCV and openGL.
· Submitted a journal paper and a patent.

Samsung Electronics Feb 2012 – Apr 2014
Implementation of Automatic Measure For 3D Quality Enhancement

· Developed a perceptual quality measuring model considering display geometry to find optimal enhancement parameter.
· Conducted subjective experiments to analyze the effects of enhancement degree.
· Implemented the software using C++.
· Submitted a conference paper.

LG Electronics Jul 2011 – Dec 2012
Development of Visual Quality Assessment Patterns

· Constructed a natural and computer graphic stereoscopic video databases to evaluate noise, sharpness, contrast, FRC, and colors of 3D displays.
· Used Autodesk Maya to make computer graphic stimuli.

· Submitted a conference paper.

HONORS AND AWARDS

· Bronze Best Paper Award, IEEE Seoul Section Student Paper Contest, 2016

· Global Ph.D Fellowship, National Research Foundation of Korea, 2011 – 2016 (Acceptance rate: 23.8%)

· IEEE IVMSP Workshop 2013 Volunteer Award, IEEE Signal Processing Society, 2013

· Merit-Based Scholarships (six times), Yonsei University, 2007 – 2010

PUBLICATIONS

Journal Publications

· **J. Kim**, H. Zeng, D. Ghadiyaram, S. Lee, L. Zhang and A. C. Bovik, "Deep convolutional neural models for picture quality prediction," *IEEE Signal Processing Magazine*. (Accepted) – Top **1.346**% (2016 JCR impact factor: 9.654)

· **J. Kim**, T. Kim, S. Lee, and A. C. Bovik, "Quality assessment of perceptual crosstalk on two-view auto-stereoscopic displays," *IEEE Transactions on Image Processing*. (Accepted) – Top **8.269**% (2016 JCR impact factor: 4.828)

· H. Oh, S. Ahn, **J. Kim**, and S. Lee, "Blind deep S3D image quality evaluation via local to global feature aggregation," *IEEE Transactions on Image Processing*. (Accepted) – Top **8.269**% (2016 JCR impact factor: 4.828)

· **J. Kim** and S. Lee, "Fully deep blind image quality predictor," *IEEE Journal of Selected Topics in Signal Processing*, vol. 11, no. 1, pp. 206220, 2017. – Top **6.731**% (2016 JCR impact factor: 5.301)

· H. Oh, **J. Kim**, J. Kim, T. Kim, S. Lee, and A. C. Bovik, "Enhancement of visual comfort and sense of presence on stereoscopic 3D images," *IEEE Transactions on Image Processing*, vol. 26, no. 8, pp. 3789-3801, 2017. – Top **8.269**% (2016 JCR impact factor: 4.828)

· S.-H. Lee, **J. Kim**, and S. Lee, "An identification framework for print-scan books in a large database," *Information Sciences*, vol. 396, pp. 3354, 2017. – Top **4.452**% (2016 JCR impact factor: 4.832)

· T. Kim, **J. Kim**, S. Kim, S. Cho, and S. Lee, "Perceptual crosstalk prediction on autostereoscopic 3D display," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. PP, no. 99, pp. 11, 2016. – Top **17.115**% (2016 JCR impact factor: 4.832)

· H. Kim, **J. Kim**, T. Oh, and S. Lee, "Blind sharpness prediction for ultra-high-definition video based on human visual resolution," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. PP, no. 99, pp. 11, 2016. – Top **17.115**% (2016 JCR impact factor: 4.832)

· J. Kim, I. Lee, **J. Kim**, and S. Lee, "Implementation of an omnidirectional human motion capture system using multiple kinect sensors," *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, vol. 98, no. 9, pp. 20042008, 2015.

Submitted Journal Publications

· **J. Kim** and S. Lee, "Deep CNN-based blind image quality predictor," *IEEE Transactions on Neural Networks and Learning Systems*, (Under revision).

Conference Proceedings

· **J. Kim** and S. Lee, "Deep blind image quality assessment by employing FR-IQA," in IEEE Conference on Image Processing (ICIP), 2017.

· **J. Kim** and S. Lee, "Deep learning of human visual sensitivity in image quality assessment framework," in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017. – Acceptance rate: 29%

· W. Kim, H. Kim, H. Oh, **J. Kim**, and S. Lee, "No-reference perceptual sharpness assessment for ultra-high-definition images," in IEEE International Conference on Image Processing (ICIP), 2016, pp. 8690.
· J. Kim, D. Kim, I. Lee, **J. Kim**, H. Oh, and S. Lee, "Human gait prediction method using Microsoft Kinect," in International Workshop on Advanced Image Technology (IWAIT), 2016.
· **J. Kim**, J. Kim, W. Kim, J. Lee, and S. Lee, "Video sharpness prediction based on motion blur analysis," in IEEE International Conference on Multimedia and Expo (ICME), 2015, pp. 16.
· B. Kwon et al., "Implementation of human action recognition system using multiple Kinect sensors," in Advances in Multimedia Information Processing – PCM 2015, 2015, pp. 334343.
· H. Oh, **J. Kim**, S. Lee, and A. C. Bovik, "3D visual discomfort predictor based on neural activity statistics," in IEEE International Conference on Image Processing (ICIP), 2015, pp. 35603564.
· **J. Kim**, T. Kim, and S. Lee, "Quality assessment of perceptual crosstalk in autostereoscopic display," in IEEE International Conference on Image Processing (ICIP), 2014, pp. 34843487.
· **J. Kim**, K. L. T. Oh, and S. Lee, "Ego motion induced visual discomfort of stereoscopic video," in Asia-Pacific Signal and Information Processing Association Annual Summit and Conference, 2013, pp. 14.
· H. Oh, **J. Kim**, and S. Lee, "Construction of stereoscopic 3D video database," in Global 3D TECH Forum, 2013.
· **J. Kim** and S. Lee, "Effects on 3D experience by space distortion in stereoscopic video," in Global 3D TECH Forum, 2012.
· **J. Kim** and S. Lee, "Visual stimuli using 3D graphic software for 3D quality assessment," in International Conference on 3D Systems and Applications (3DSA), 2012.

Tech Reports & Standardization Documents

· IEEE Standard for Quality of Experience (QoE) and Visual-Comfort Assessments of Three-Dimensional (3D) Contents Based on Psychophysical Studies, in IEEE Std 3333.1.1-2015, 2015.
· 3DTV Broadcasting Safety Guideline, Telecommunications Technology Association, TTAK.KO-07.0086/R4, 2015

TECHNICAL SKILLS

Computer Languages	C, C++, Python, Matlab, LaTeX
Frameworks & APIs	Theano, TensorFlow, NumPy, OpenCV, OpenGL