

JONGYOO KIM

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RESEARCH INTEREST

Perceptual image and 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 technical meetings and handled standardization processes of developing projects (P3333.1.2 and P3333.1.3)
- Submitted technical contribution regarding visual sharpness measurement, and deep learning-based 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.
- Analyzed the statistical relationship between bio signals and content features.

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 Neural Networks and Learning Systems*.
- Implemented the software using 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.
- Implemented the software using Matlab and TensorFlow.
- Submitted a patent.

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 tests).
- Developed a perceptual crosstalk prediction method of auto-stereoscopic displays.
- Implemented the software using Matlab.
- Submitted a conference paper and a journal paper.

Electronics and Telecommunications Research Institute

Mar 2015 - Feb 2016

Research on Feature Extraction and DB Construction for Image-based Indoor Localization

- Implemented an image based localization software, which consists of feature point extraction (multi thread), matching, Levenberg-Marquardt optimization-based localization, and interactive visualization (open GL).
- Implemented the software using C++, and Hessian matrices were obtained using Matlab.

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 fusing system obtained from 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++.
- Submitted a 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 with different degrees of enhancement.
- 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 displays.

HONORS AND AWARDS

Bronze Best Paper Award in 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), 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