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RESEARCH INTERESTS **Computer Vision and Image Processing**

- 3D shape reconstruction from images and videos
- Computational image reconstruction

Mobile/Embedded Computer Vision

- Customizing computer vision and image processing algorithms for mobile devices
- Computing and optimization on embedded CPU and GPU

General Purpose Computation on GPU (GPGPU)

- Parallel computing using CUDA, OpenCL, and GLSL
- Real-time algorithm development for image processing and computer vision

ACADEMIC BACKGROUND **Seoul National University, Seoul, Korea**

- Ph.D. in Electrical Engineering and Computer Science, August 2001
- Dissertation title: Shape adaptive multiresolution approaches for 3-D object reconstruction, modeling, and simplification
 - Advisor: Prof. Sang Uk Lee (*IEEE Fellow*)
 - Co-advisor: Prof. Kyoung Mu Lee

Seoul National University, Seoul, Korea

- M.S. in Control and Instrumentation Engineering, February 1997
 - Advisor: Prof. Sang Uk Lee (*IEEE Fellow*)

Seoul National University, Seoul, Korea

- B.S. in Control and Instrumentation Engineering (cum laude), February 1995

PROFESSIONAL EXPERIENCE

2015.09 –	Professor , Inha University, Incheon, Korea
2004.03 – 2015.08	Assistant/Associate Professor , Inha University, Incheon, Korea
2014.09 – 2015.08	Visiting Associate Professor , MIT Media Lab, Cambridge, MA, USA
2007.01 – 2008.02	Visiting Researcher (funded position), Mitsubishi Electric Research Laboratories (MERL), Cambridge, MA, USA
2001.09 – 2004.02	Member of Technical Staff , Samsung Advanced Institute of Technology (SAIT), Giheung, Korea

1. Williem, **I. K. Park** (corresponding author), and K. M. Lee, "Robust light field depth estimation using occlusion-noise aware data costs," accepted for publication in *IEEE Trans. on Pattern Analysis and Machine Intelligence* (IF: 8.329).
2. Jun Young Cheong, Christian Simon, Chang-Su Kim, and **I. K. Park** (corresponding author), "Reflection removal under fast forward camera motion," *IEEE Trans. on Image Processing* (IF: 4.828), vol. 26, no. 12, pp. 6061-6073, December 2017.
3. J. Y. Cheong and **I. K. Park** (corresponding author), "Deep CNN-based super-resolution using external and internal examples," *IEEE Signal Processing Letters* (IF: 2.528), vol. 24, no. 8, pp. 1252-1256, August 2017.
4. M. H. Lee and **I. K. Park** (corresponding author), "Performance evaluation of local descriptors for maximally stable extremal regions," *Journal of Visual Communication and Image Representation* (IF: 2.164), vol. 47, pp. 62-72, August 2017.
5. Williem, K. W. Shon, and **I. K. Park** (corresponding author), "Spatio-angular consistent editing framework for 4D light field images," *Multimedia Tools and Applications* (IF: 1.530), vol. 75, no. 23, pp. 16615-16631, December 2016.
6. M. H. Lee and **I. K. Park** (corresponding author), "Blur invariant feature descriptor using multidirectional integral projection," *ETRI Journal* (IF: 1.116), vol. 38, no. 3, pp. 502-509, June 2016.
7. M. H. Lee, M. Cho, and **I. K. Park** (corresponding author), "Feature description using local neighborhoods," *Pattern Recognition Letters* (IF: 1.995), vol. 68, pp. 76-82, December 2015.
8. C. Simon, Williem, and **I. K. Park** (corresponding author), "Correcting geometric and photometric distortion of document images on a smartphone," *Journal of Electronic Imaging* (IF: 0.754), vol. 24, no. 1, 013038, January 2015.
9. H. Y. Jung, H. Park, **I. K. Park**, K. M. Lee, and S. U. Lee, "Stereo reconstruction using high-order likelihoods," *Computer Vision and Image Understanding* (IF: 2.498), vol. 125, pp. 223-236, August 2014.
10. N. Seiller, Williem, N. Singhal, and **I. K. Park** (corresponding author), "Object-oriented framework for image processing on GPU," *Multimedia Tools and Applications* (IF: 1.530), vol. 70, no. 3, pp. 2347-2368, June 2014.
11. Williem, Y. W. Tai, and **I. K. Park** (corresponding author), "Accurate and real-time depth video acquisition using Kinect-stereo camera fusion," *Optical Engineering* (IF: 1.082), vol. 53, no. 4, 043110, April 2014.
12. M. S. Bae and **I. K. Park** (corresponding author), "Content-based 3D model retrieval using a single depth image from a low-cost 3D camera," *The Visual Computer* (IF: 1.468), vol. 29, no. 6-8 (CGI 2013 special issue, 16.4% acceptance ratio), pp. 555-564, June 2013.
13. J. W. Yoo, S. Yea, and **I. K. Park** (corresponding author), "Content-driven retargeting of stereoscopic images," *IEEE Signal Processing Letters* (IF: 2.528), vol. 20, no. 5, pp. 519-522, May 2013.
14. T. J. Park and **I. K. Park** (corresponding author), "HDR image acquisition using multiple images with different aperture," *Optical Engineering* (IF: 1.082), vol. 51, no. 12, 127002, December 2012.
15. N. Singhal, J. W. Yoo, H. Y. Choi, and **I. K. Park** (corresponding author), "Implementation and optimization of image processing algorithms on embedded GPU," *IEICE Trans. on Information and Systems* (IF: 0.411), vol. E95-D, no. 5, pp. 1475-1484, May 2012.

16. H. Hong, L. Li, **I. K. Park**, and T. Zhang, "Universal deblurring method for real images using transition region," *Optical Engineering* (IF: 1.082), vol. 51, no. 4, 047005, April 2012.
17. J. Y. Chang, H. Park, **I. K. Park** (corresponding author), K. M. Lee, and S. U. Lee, "GPU-friendly multi-view stereo reconstruction using surfel representation and graph cuts," *Computer Vision and Image Understanding* (IF: 2.498), vol. 115, no. 5, pp. 620-634, May 2011.
18. **I. K. Park** (corresponding author), N. Singhal, M. H. Lee, S. Cho, and C. Kim, "Design and performance evaluation of image processing algorithms on GPUs," *IEEE Trans. on Parallel and Distributed Systems* (IF: 4.181), vol. 22, no. 1, pp. 91-104, January 2011.
19. O. Teramoto, **I. K. Park** (corresponding author), and T. Igarashi, "Interactive motion photography from a single image," *The Visual Computer* (IF: 1.468), vol. 26, no. 11, pp. 1339-1348, November 2010.
20. H. Hong and **I. K. Park** (corresponding author), "Single image motion deblurring using adaptive anisotropic regularization," *Optical Engineering* (IF: 1.082), vol. 49, no. 9, 097008, September 2010.
21. **I. K. Park** (corresponding author), M. Germann, M. D. Breitenstein, and H. Pfister, "Fast and automatic object pose estimation for range images on the GPU," *Machine Vision and Applications* (IF: 2.005), vol. 21, no. 5, pp. 749-766, August 2010.
22. M. H. Lee and **I. K. Park** (corresponding author), "Image-based modeling of 3D objects with curved surfaces," *Computer Animation and Virtual Worlds* (IF: 0.424), vol. 19, no. 2, pp. 93-109, May 2008.
23. **I. K. Park** (corresponding author), H. Zhang, and V. Vezhnevets, "Image-based 3-D face modeling system," *EURASIP Journal on Applied Signal Processing* (1.961), vol. 2005, no. 13, pp. 2072-2090, August 2005.
24. L. Levkovich-Maslyuk, A. Ignatenko, A. Zhirkov, A. Konushin, **I. K. Park** (corresponding author), M. Han, and Y. Bayakovski, "Depth image-based representation and compression for static and animated 3D objects," *IEEE Trans. on Circuits and Systems for Video Technology* (IF: 4.582), vol. 14, no. 7, pp. 1032-1045, July 2004.
25. **I. K. Park**, K. M. Lee, and S. U. Lee, "Perceptual grouping of line features in 3-D space: A model-based framework," *Pattern Recognition* (IF: 3.399), vol. 37, no. 1, pp. 145-159, January 2004.
26. **I. K. Park**, K. M. Lee, and S. U. Lee, "Models and algorithms for efficient multiresolution topology estimation of measured 3-D range data," *IEEE Trans. on Systems, Man, and Cybernetics, Part B: Cybernetics* (IF: 6.220), vol. 33, no. 4, pp. 706-711, August 2003.
27. **I. K. Park**, S. W. Lee, and S. U. Lee, "Shape-adaptive 3-D mesh simplification based on local optimality measurement," *Journal of Visualization and Computer Animation* (IF: 0.424), vol. 14, no. 2, pp. 93-109, May 2003.
28. **I. K. Park**, K. M. Lee, and S. U. Lee, "Efficient measurement of shape dissimilarity between 3-D models using Z-buffer and surface roving method," *EURASIP Journal on Applied Signal Processing* (1.961), vol. 2002, no. 10, pp. 1127-1134, October 2002.
29. **I. K. Park**, I. D. Yun, and S. U. Lee, "Automatic 3-D model synthesis from measured range data," *IEEE Trans. on Circuits and Systems for Video Technology* (IF: 3.599), vol. 10, no. 2, pp. 293-301, March 2000.

30. **I. K. Park**, I. D. Yun, and S. U. Lee, “Color image retrieval using hybrid graph representation,” *Image and Vision Computing (IF: 2.671)*, vol. 17, No. 7, pp. 465-474, May 1999.

REFEREED PAPERS
IN TOP
INTERNATIONAL
CONFERENCES

1. Williem and **I. K. Park** (corresponding author), “Robust light field depth estimation for noisy scene with occlusion,” *Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 4396-4404, June 2016.
2. Williem, R. Raskar, and **I. K. Park** (corresponding author), “Depth map estimation and colorization of anaglyph images using local color prior and reverse intensity distribution,” *Proc. IEEE International Conference on Computer Vision (ICCV)*, pp. 3460-3468, December 2015.
3. C. Simon and **I. K. Park** (corresponding author), “Reflection removal for in-vehicle black box videos,” *Proc. IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 4231-4239, June 2015.
4. S. W. Choi, C. H. Lee, and **I. K. Park** (corresponding author), “Scene classification via hypergraph-based semantic attribute subnetworks identification,” *Proc. European Conference on Computer Vision (ECCV)*, LNCS vol. 8695, pp. 361-376, September 2014.

REFEREED PAPERS
IN OTHER
INTERNATIONAL
CONFERENCES

1. Williem, Andre Ivan, Hochang Seok, Jongwoo Lim, Kuk-Jin Yoon, Ikhwan Cho, and **I. K. Park**, “Visual-inertial RGB-D SLAM for mobile augmented reality,” *Proc. Pacific-Rim Conference on Multimedia (PCM 2017)*, September 2017.
2. Jonathan Samuel Lumentut, Williem, and **I. K. Park**, “Feature Descriptors for 4D Light Field Images,” *Proc. The 23th Japan-Korea Workshop on Frontiers of Computer Vision (FCV 2017)*, February 2017.
3. S. J. Lee and **I. K. Park**, “Learning-based superresolution for 4D light field images,” *Proc. International Technical Conference on Circuits/Systems, Computers and Communications*, June 2015.
4. C. Simon, M. H. Lee, and **I. K. Park**, “Quality enhancement for feature matching on car black box videos,” *Proc. APSIPA Annual Summit and Conference*, December 2014.
5. M. H. Lee and **I. K. Park**, “Performance evaluation of local descriptors for affine invariant region detector,” *Proc. ACCV Workshop on Robust Local Descriptors for Computer Vision*, LNCS vol. 9008, pp. 630-643, November 2014.
6. C. Simon and **I. K. Park**, “Video tonal stabilization with automatic multiple anchor frames,” *Proc. The 18th IEEE International Symposium on Consumer Electronics (ISCE 2014)*, pp. 11-12, June 2014. [Best Paper Award]
7. C. Simon, Williem, J. Choe, I. D. Yun, and **I. K. Park**, “Correcting photometric distortion of document images on a smartphone,” *Proc. Fourth IEEE Workshop on Mobile Vision (in conjunction with CVPR 2014)*, pp. 199-200, June 2014.
8. Williem, C. Simon, S. Cho, and **I. K. Park**, “Fast and robust perspective rectification of document images on smartphone,” *Proc. Fourth IEEE Workshop on Mobile Vision (in conjunction with CVPR 2014)*, pp. 197-198, June 2014.
9. S. H. Kang, S.-J. Lee, and **I. K. Park**, “Parallelization and Optimization of Feature Detection Algorithms on Embedded GPU,” *Proc. International Workshop on Advanced Image Technology (IWAIT)*, pp. 164-167, January 2014.
10. M. H. Lee and **I. K. Park**, “Robust feature description and matching using local graph,” *Proc. APSIPA Annual Summit and Conference*, October 2013.

11. Y.-K. Choi and **I. K. Park**, “Efficient GPU-based graph cuts for stereo matching,” *Proc. Ninth IEEE Embedded Vision Workshop (EVW in conjunction with CVPR)*, pp. 642-648, June 2013.
12. Y.-K. Choi, Williem, and **I. K. Park**, “Memory-efficient belief propagation in stereo matching on GPU,” *APSIPA Annual Summit and Conference*, December 2012.
13. J. H. Won, M. H. Lee, and **I. K. Park**, “Active 3D shape acquisition using smartphones,” *Proc. Ninth IEEE International Workshop on Projector-Camera Systems (PROCAMS in conjunction with CVPR)*, pp. 29-34, June 2012.
14. N. Singhal, J. W. Yoo, H. Y. Choi, and **I. K. Park**, “Design and optimization of image processing algorithms on mobile GPU,” SIGGRAPH Poster Presentation, August 2011.
15. W. B. Lee, M. H. Lee, and **I. K. Park**, “Photorealistic 3D face modeling on a smartphone,” *Proc. Seventh IEEE Workshop on Embedded Computer Vision (ECVW in conjunction with CVPR)*, pp. 163-168, June 2011.
16. H. Park, J. Y. Chang, M. H. Lee, **I. K. Park**, K. M. Lee, and S. U. Lee, “GPU-friendly multi-view stereo reconstruction using surfel representation and graph cuts,” GPU Technology Conference (GTC), Poster F07, September 2010.
17. H. Hong and **I. K. Park**, “Single image motion deblurring using anisotropic regularization,” *Proc. IEEE International Conference on Image Processing (ICIP)*, pp. 1149-1152, September 2010.
18. N. Seiller, N. Singhal, and **I. K. Park**, “Object oriented framework for real-time image processing on GPU,” *Proc. IEEE International Conference on Image Processing (ICIP)*, pp. 4477-4480, September 2010.
19. N. Singhal, **I. K. Park**, and S. Cho, “Implementation and optimization of image processing algorithms on handheld GPU,” *Proc. IEEE International Conference on Image Processing (ICIP)*, pp. 4481-4484, September 2010.
20. M. H. Lee, N. Singhal, S. Cho, and **I. K. Park**, “Mobile photo collage,” *Proc. Sixth IEEE Workshop on Embedded Computer Vision (ECVW in conjunction with CVPR)*, June 2010. [Best Paper Award]
21. **I. K. Park**, N. Singhal, M. H. Lee, and S. Cho, “Efficient design and implementation of visual computing algorithms on the GPU,” *Proc. IEEE International Conference on Image Processing (ICIP)*, pp. 2321-2324, November 2009.
22. Marcel Germann, Michael D. Breitenstein, **I. K. Park** (공저자), and Hanspeter Pfister, “Automatic pose estimation for range images on the GPU,” *Proc. Sixth International Conference on 3-D Digital Imaging and Modeling (3DIM)*, pp. 81-88, August 2007.
23. C. Y. Kim, M. H. Lee, and **I. K. Park**, “Feature-based interactive 3D face modeling,” *Proc. Japan-Korea Workshop on Frontiers of Computer Vision (FCV)*, pp. 253-256, January 2007.
24. M. H. Lee and **I. K. Park**, “Image-based approach for modeling 3D shapes with curved surfaces,” *Proc. Pacific Conference on Computer Graphics and Applications (Pacific Graphics)*, pp. 70-75, October 2006.
25. M. H. Lee and **I. K. Park**, “Accelerating depth image-based rendering using GPU,” *Proc. International Workshop on Multimedia Content Representation, Classification and Security*, LNCS vol. 4105, pp. 562-569, September 2006., vol. 4105, pp. 562-569, September 2006.

26. H. Zhang and **I. K. Park**, "Easy and convincing ear modeling for virtual human," *Proc. Pacific Rim Conference on Multimedia (PCM)*, LNCS vol. 3331, pp. 394-401, December 2004.
27. D. H. Kim, **I. K. Park**, I. D. Yun, and S. U. Lee, "A new MPEG-7 standard: Perceptual 3-D shape descriptor," *Proc. Pacific Rim Conference on Multimedia (PCM)*, LNCS vol. 3332, pp. 238-245, December 2004.
28. G. J. Jang, K. H. Kim, and **I. K. Park**, "Depth image-based rendering of 3-D object on mobile device," *Proc. IEEE International Symposium on Intelligent Signal Processing and Communication Systems*, pp. 630-633, November 2004.
29. **I. K. Park**, H. Zhang, V. Vezhnevets, and H.-K. Choh, "Image-based photorealistic 3-D face modeling," *Proc. IEEE International Conference on Automatic Face and Gesture Recognition (FGR)*, pp. 49-54, May 2004.
30. V. Vezhnevets, S. Soldatov, A. Degtiareva, and **I. K. Park**, "Automatic extraction of frontal facial features," *Proc. Asian Conference on Computer Vision (ACCV)*, vol. 2, pp. 1020-1025, January 2004.
31. **I. K. Park**, S. W. Lee, and S. U. Lee, "Shape-adaptive 3-D mesh simplification based on local optimality measurement," *Proc. Pacific Conference on Computer Graphics and Applications (Pacific Graphics)*, pp. 462-466, October 2002.
32. Y. Bayakovski, L. Levkovich-Maslyuk, A. Ignatenko, A. Konushin, D. Timasov, A. Zhirkov, M. Han, and **I. K. Park**, "Depth image-based representations for static and animated 3D objects," *Proc. IEEE International Conference on Image Processing (ICIP)*, vol. III, pp. 25-28, September 2002.
33. **I. K. Park**, K. M. Lee, J. Y. Jang, and S. U. Lee, "Multiresolution topology estimation of 3-D range data," *Proc. Asian Conference on Computer Vision (ACCV)*, vol. II, pp. 469-474, January 2002.
34. **I. K. Park**, K. M. Lee, and S. U. Lee, "A new shape dissimilarity measuring technique between 3-D models using Z-buffer and surface roving method," *Proc. Digital Image Computing - Techniques and Applications*, pp. 62-67, January 2002.
35. **I. K. Park**, K. M. Lee, and S. U. Lee, "Recognition and reconstruction of 3-D objects using model-based perceptual grouping," *Proc. International Conference on Pattern Recognition (ICPR)*, vol. I, pp. 720-724, September 2000.
36. **I. K. Park**, K. M. Lee, and S. U. Lee, "Perceptual grouping of 3-D features in aerial image using decision tree classifier," *Proc. IEEE International Conference on Image Processing (ICIP)*, vol. I, pp. 31-35, October 1999.
37. **I. K. Park**, I. D. Yun, and S. U. Lee, "Constructing NURBS surface model from scattered and unorganized range data," *Proc. Second International Conference on 3-D Digital Imaging and Modeling (3DIM)*, pp. 312-320, October 1999.
38. **I. K. Park**, I. D. Yun, and S. U. Lee, "A color normalization algorithm for image indexing," *Proc. Asian Conference on Computer Vision (ACCV)*, LNCS vol. 1351, pp. 96-103, January 1998.
39. **I. K. Park** and S. U. Lee, "Geometric modeling from scattered 3-D range data," *Proc. IEEE International Conference on Image Processing (ICIP)*, vol. II, pp. 712-715, October 1997.

40. **I. K. Park**, I. D. Yun, and S. U. Lee, "Models and algorithms for efficient color image indexing," *Proc. IEEE Workshop on Content-based Access of Image and Video Libraries*, pp. 36-41, June 1997.

INTERNATIONAL
PATENTS

1. N. Singhal, S.-D. Cho, **I. K. Park**, M. H. Lee, "Method and apparatus for composing image," US 8638979 B2, January 2014.
2. **I. K. Park**, A. O. Zhirkov, M.-J. Han, "Apparatus and method for depth image-based representation of 3-dimensional object," US 8390622 B2, March 2013.
3. S.-J. Won, Y.-J. Oh, S.-D. Cho, T.-H. Hong, S.-K. Kim, M.-W. Lee, **I. K. Park**, and M. H. Lee, "Method and apparatus for high-speed image processing based on graphic processing unit," US 8325197 B2, December, 2012.
4. **I. K. Park**, A. Zhirkov, M. Han, A. Ignatenko, and L. Levkovich-Maslyuk, "Apparatus and method for depth image-based representation of 3-dimensional object," US 8217941 B2, July 2012.
5. A. Zhirkov, L. Levkovich-Maslyuk, **I. K. Park**, A. Ignatenko, and M. Han, "Node structure for representing 3-dimensional objects using depth image," US 8022951 B2, September 2011.
6. H. Pfister, **I. K. Park**, M. German, and M. Breitenstein, "Method and system for determining poses of objects from range images using adaptive sampling of pose spaces," US 7844106 B2, November 2010.
7. **I. K. Park**, H.-K. Choh, V. Vezhnevets, and H. Zhang, "Method and apparatus for image-based photorealistic 3D face modeling," US 7835568 B2, November 2010.
8. C. W. Chu, J. C. Kim, **I. K. Park**, and B. K. Koo, "Method for creating 3-D curved surface by using corresponding curves in a plurality of images," US 7812839 B2, October 2010.
9. **I. K. Park**, J. Y. Han, M. Han, A. Ignatenko, A. Konushin, and L. Levkovich-Maslyuk, "Image-based rendering and editing method and apparatus," US 7453455, November 2008.
10. **I. K. Park**, G. J. Jang, J. Y. Han, S. Y. Jung, and K. H. Kim, "Method and/or apparatus for high speed visualization of depth image-based 3D graphic data," US 7450132, November 2008.
11. **I. K. Park**, S.-J. Lee, I.-W. Song, C.-S. Kim, and S.-U. Lee, "Method and apparatus for encoding and decoding three-dimensional object data," US 7263236, August 2007.
12. **I. K. Park**, D. K. Kim, S. U. Lee, I. D. Yun, and D. H. Kim, "Method of perceptual 3D shape description and method and apparatus for searching 3D graphics model database using the description method," US 7171060, January 2007.

HONORS AND
AWARDS

1. Best paper award, The 23th Japan-Korea Workshop on Frontiers of Computer Vision (FCV 2017).
2. Outstanding Reviewer (68 out of 1233, 5.5%), IEEE International Conference on Computer Vision (ICCV 2015).
3. Best paper award, Eighteenth IEEE International Symposium on Consumer Electronics (ISCE), June 2014.
4. Best paper award, Sixth IEEE Workshop on Embedded Computer Vision (ECVW in conjunction with CVPR), June 2010.
5. Silver prize, Seventh Samsung Humantech Thesis Prize, February 2001.

6. Bronze prize, Fourth Samsung Humantech Thesis Prize, February 1998.

ACADEMIC
SERVICES

Journal Reviewer

- ACM TOG, CVIU, IEEE TIP, IEEE TCSVT, IEEE TPDS, JVCI, EURASIP JASP, EURASIP SP, IPSJ CVA, FCS
- Journal of KIISE, IEEK, KOSBE, KICS, KIPS

Conference Paper Reviewer

- CVPR, ICCV, ECCV, ACCV, ICPR, Pacific Graphics, SIGGRAPH Asia, PSIVT, PCM, APSIPA

Conference Committee

- ACCV 2012 Publication Chair
- IPIU 2017 Program Chair
- ICCV 2019 Local Arrangement Chair
- Member of Technical Committee in many other conferences