
CONTACT INFORMATION	NVIDIA Research 2701 San Tomas Expressway Santa Clara, CA 95050 USA	<i>Mobile:</i> +1-678-707-3912 <i>E-mail:</i> kihwan23.kim@gmail.com <i>Homepage:</i> www.kihwan23.com
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RESEARCH INTERESTS	Video analysis, dynamic scene analysis and visualization, scattered data interpolation/approximation, multi-view geometry, real-time rendering, augmented reality, object detection, and object tracking	
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EDUCATION	Georgia Institute of Technology	Atlanta, Georgia
	Ph.D. in Computer Science, Dec. 2011	GPA: 3.87/4.0
	<ul style="list-style-type: none"> • Thesis: <i>Spatio-temporal Data Interpolation for Dynamic Scene Analysis</i> • Advisor: Professor Irfan Essa • Area of Study: Computer Vision and Graphics • Minor: Numerical methods for PDE and Optimization 	
	M.S. in Computer Science, Aug. 2010	GPA: 3.87/4.0
	<ul style="list-style-type: none"> • Advisor: Professor Irfan Essa • Area of Study: Computer Vision and Graphics 	
	Yonsei University	Seoul, South Korea
	B.S. in Electrical Engineering, Feb. 2001	GPA: 3.71/4.0 upper, 3.45/4.0 overall

EMPLOYMENT HISTORY	NVIDIA Corporate, NVIDIA Research Research Scientist	Santa Clara, California Jan. 2012 – Present
	Georgia Institute of Technology, College of Computing Graduate Research Assistant	Atlanta, Georgia Aug. 2005 – Dec. 2011
	Disney Research Pittsburgh Visiting Research Associate/Research Intern	Pittsburgh, Pennsylvania Jan. 2009 – Aug. 2009
	Samsung IT R&D Center, SDS Advisory Engineer	Seoul, South Korea Mar. 2001 – Aug. 2005
	Samsung Electronics, Digital Solution Center Ubiquitous Task Force	Seoul, South Korea Jun. 2003 – Jan. 2004
	Republic of Korea Air Force Engineer/Sergeant	Suwon, South Korea Mar. 1996 – Sep. 1998

REFEREED JOURNAL PUBLICATIONS	[VR11] K. Kim, S. Oh, J. Lee and I. Essa, <i>Augmenting Aerial Earthmaps with Dynamic Information from Videos</i> , In <i>Virtual Reality Journal</i> [Special issue on Augmented Reality], Springer London, 2011 (VR)	
	[JGT08] B. Kim, K. Kim and G. Turk, <i>A Shadow Volume Algorithm for Opaque and Transparent Non-Manifold Casters</i> , In <i>Journal of Graphics Tools</i> , A.K. Peters, 2008	
SUBMITTED JOURNAL PUBLICATIONS	[PAMI11] K. Kim, M. Grundmann, A. Shamir, I. Matthews, J. Hodgins, and I. Essa, <i>Analysis of Motion Field on the Ground Plane to Predict Play Evolution</i> . In <i>IEEE Transaction on Pattern Analysis and Machine Intelligence</i> , 2011 (tPAMI)	

REFEREED
CONFERENCE
PUBLICATIONS

[CVPR12] K. Kim, D. Lee, and I. Essa, *Detecting Regions of Interest in Dynamic Scenes with Camera Motions*, In *Proceeding of 2012 IEEE Conference on Computer Vision and Pattern Recognition*

[ICCV11] K. Kim, D. Lee, and I. Essa, *Gaussian Process Regression Flow for Analysis of Motion Trajectories*, In *Proceeding of 2011 IEEE International Conference on Computer Vision*

[CVPR10A] K. Kim, M. Grundmann, A. Shamir, I. Matthews, J. Hodgins, and I. Essa, *Motion Fields to Predict Play Evolution in Dynamic Sports Scenes*, In *Proceeding of 2010 IEEE Conference on Computer Vision and Pattern Recognition*

[CVPR10B] R. Hamid, R. Kumar, M. Grundmann, K. Kim, I. Essa and J. Hodgins, *Player Localization Using Multiple Static Cameras for Sports Visualization*, In *Proceeding of 2010 IEEE Conference on Computer Vision and Pattern Recognition*

[ISMAR09] K. Kim, S. Oh, J. Lee and I. Essa, *Augmenting Aerial Earth Maps with Dynamic Information*, In *Proceeding of 2009 IEEE/ACM International Symposium on Mixed and Augmented Reality*

[ISWC08] K. Kim, J. Summet, T. Starner, D. Ashbrook, M. Kapade and I. Essa, *Localization and 3D Reconstruction of Urban Scenes Using GPS*, In *Proceeding of 2008 IEEE International Conference on Wearable Computers*

[ACMMM06] K. Kim, I. Essa and G. D. Abowd, *Interactive Mosaic Generation for Video Navigation*, In *Proceeding of 2006 ACM International Conference on Multimedia*

SUBMITTED
CONFERENCE
PUBLICATIONS
OTHER
PUBLICATIONS
POSTERS,
TECH' REPORTS

[S11] M. Grundmann, K. Kim, V. Kwatra, and I. Essa, *Automated Broadcast of Sports using Video Retargeting from Play Analysis*.

[STS11][ISMICS 2011] E. Sarin, K. Kim, I. Essa, and W. Cooper, *3-Dimensional Visualization of the Operating Room Using Advanced Motion Capture: A Novel Paradigm to Expand Simulation-Based Surgical Education*

[4GS09] K. Kim, M. Grundmann, I. Essa, *Collaborative Crowd-casting using Mobile devices*, In *4G Symposium*, Las Vegas 2009

[TECH07] B. Kim, K. Kim, G. Turk, *Real-time Shadow of Transparent Casters Using Shadow Volume*, In *Georgia Institute of Technology Technical Report GT-IC-07-04*

[TECH06] K. Kim, J. Summet, T. Starner, D. Ashbrook, M. Kapade and I. Essa, *Localization and 3D Reconstruction of Urban Scenes Using GPS*, 2008 In *Georgia Institute of Technology Technical Report GT-IC-08-06*

[GT-CMU06A] K. Kim, I. Essa and F. Dellaert *Augmenting Earth Maps with Dynamic Information Using Vanishing Point Clustering*, In 2006 GT-CMU Retreat for Graphics

[GT-CMU06B] B. Kim and K. Kim, *Transparent Shadow Casters and Softened Self-Shadow Using Shadow Volume*, In 2006 GT-CMU Retreat for Graphics

[GT-CMU05] K. Kim and I. Essa, *Multi-scale Photomosaic*, In 2005 GT-CMU Retreat for Graphics

THESIS

[BSTHESIS01] K. Kim, *Simple Enhanced Block-Matching Algorithm for Intermediate View Reconstruction*, Department of Electrical Engineering, Yonsei University

INVITED
TALK

[SNU11] K. Kim, *Spatio-temporal Analysis of Videos for Visualization*, Department of Computer Science and Engineering, Seoul National University January.2011

MEDIA
COVERAGE

[CNN09] H. Collins, J. Levs, *New technology tracks movement on ground*, CNN News-room, aired on October 2009

[NS09] V. Venkatraman, *Live video makes Google Earth cities bustle*, NewScientist, September 2009, Magazine Issue 2728

[PS09] S.F. Locke, *Augmented Google Earth Gets Real-Time People, Cars, Clouds*, PopularScience, September 2009

RESEARCH AND
PROFESSIONAL
PROJECTS
INVOLVED

NVIDIA Research

Santa Clara, CA USA

Mobile Visual Computing

- Video and image analysis for mobile computational photography/videography

Georgia Institute of Technology

Atlanta, Georgia

Dynamic Scene Analysis

- Recognizing traffic patterns and detecting anomalous events using Gaussian Process Regression Flow, and 4th-order moment. Persistent Stare Exploitation and Analysis System (*PerSEAs*) with *Kitware/DARPA*. Published in **[ICCV11]**
- Analysis and prediction of multi-agent motions in dynamic sports scene. (*Microcasting at Disney Research*) Spatio-temporal radial basis network for dense flow generation. Tracking ground positions using geometric constraint optimization. Published in **[CVPR10A]** and **[CVPR10B]** Submitted in **[PAMI11]**
- Video retargeting for automated sports broadcasting. Auto-directed crop region, and its paths are calculated from motion saliency. Submitted to **[S11]**

Dynamic Scene Visualization and Augmented Reality

- City-level visualization of dynamic scenes from distributed videos using spatio-temporal interpolation and analysis. Published in **[ISMAR09]**, **[VR11]**, **[4GS09]** and **[GT-CMU06A]** Media coverage and articles in **[CNN09]**, **[NS09]** and **[PS09]**
- 3D Reconstruction and localization of nearby buildings from the analysis of GPS signals having low signal-to-noise ratio. Published in **[ISWC08]** and **[TECH06]**

Video-based Rendering

- Video-based spatio-temporal view interpolation for Simulating Cardiac Surgery (Emory/Inova Heart Vascular Institute) Presented in **[STS11]** and **[ISMICS11]**
- Generation of painterly and water-colored videos using fore-ground segmentation and gradient field (Samsung STAR/SAIT) Fed into mobile NPR project.

Interactive Video and Multimedia System

- Automatic generation of the annotated collection of mosaics for interactive video navigation. (AwareHome/Tunmer Studio) **[ACMMM06]** and **[GT-CMU05]**

Real-time Rendering Algorithm

- Generalized Shadow Volume algorithm for the real-time rendering of non-manifold transparent casters. Published in **[JGT08]**, **[TECH07]** and **[GT-CMU06B]**

Disney Research, Pittsburgh

Pittsburgh, PA USA

Scene Analysis and Micro-casting

- Conducted a project for detecting important location in the game. Designed and implemented proto-type system for micro-casting. **[CVPR10A]**
- Implemented player tracking algorithm using particle filter and mean-shift, and team classification algorithm for sports visualization. **[CVPR10B]**

Samsung IT R&D Center, SDS, and Samsung Electronics Seoul, South Korea

Face Recognition, Real-time Collaboration System

- Responsible for face detection part. Fisher-face, and statistical skin segmentation were used for ViaFace™. Appeared in COMDEX 2001 Las Vegas.
 - Designed and developed Real-time Collaboration System: Syncbiz™ (2002 Samsung Best solution award)
 - Developed embedded framework for IP-Set top box: LivingWise™ (fed into Korea Telecommunication's IP-STB services)
 - Ubiquitous Home network framework: NEX (framework fed into U-City projects at Samsung SDS): Remote Management system in the home server for U-City.
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SOFTWARE AND HARDWARE SKILLS Languages, Scripts, and Wrappers:

- C, C++, Embedded C, Java, JavaScript, MFC, ATL, COM, SQL, MySQL, MATLAB, under various IDE environments
- Libraries for Vision/Graphics/Math : OpenCV, OpenGL, DirectX, Lapack, Intel Math Kernel Library

Digital Logic Circuit:

- FPGA and Computer-Aided Design Tools: VHDL, MAX+PLUS, SPICE

Video and Image Editing tools, and Renderer:

- 3D Studio Max, Autodesk Maya, Adobe Photoshop, Premiere, and others
- POV-Ray, Indigo, Blender

LANGUAGES Fluent in Korean, English and Japanese

REFERENCES Available in:
<http://www.kihwan23.com/jobsearch/docs/reference-list.pdf>

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