

## Sung-Eui Yoon

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### Education

- **Ph.D., Computer Science** 08/2001-12/2005  
Thesis title: Interactive Visualization and Collision Detection using Dynamic Simplification and Cache-Coherent Layouts  
Advisor: Prof. Dinesh Manocha  
University of North Carolina at Chapel Hill, Chapel Hill, NC, USA
- **M.S., Electrical Engineering and Computer Science** 03/1999-02/2001  
Advisor: Prof. Yeong-Gil Shin  
Seoul National University, Seoul, South Korea
- **B.S., Computer Science** 03/1995-02/1999  
Seoul National University, Seoul, South Korea

### Research Interests

- Scalable algorithms in the fields of computer graphics, computer vision, robotics, and other related problems

### Professional Experiences

- **Professor** 9/2019-Present  
*School of Computing, Dept. of Computer Science, KAIST*
- **Visiting Scholar** 7/2017-6/2018  
*Donald Bren School of Information and Computer Sciences, Univ. of California, Irvine, USA*
- **Tenured** 3/2015  
*Dept. of Computer Science, Korea Advanced Institute of Science and Technology (KAIST)*
- **Associate Professor** 9/2011-8/2019  
*Dept. of Computer Science, Korea Advanced Institute of Science and Technology (KAIST)*
- **Assistant Professor** 7/2007-8/2011  
*Dept. of Computer Science, Korea Advanced Institute of Science and Technology (KAIST)*
- **Postdoctoral researcher** 1/2006-6/2007  
*Data Analysis Group, CASC, Lawrence Livermore Nat'l Lab., USA*
- **Research Assistant** 1/2002-12/2005  
*Gamma and Walkthrough Groups, Dept. Computer Science, UNC-Chapel Hill, USA*
- **Summer Internships** 5/2004- 8/2004, 5/2005- 8/2005  
*Center for Applied Scientific Computing, Lawrence Livermore National Laboratory (LLNL)*

- **Teaching Assistants** 9/1999-12/1999, 3/2000-6/2000, 8/2001-12/2001  
*Computer Graphics, Dept. Computer Science, UNC-Chapel Hill*  
*Computer Graphics and Data Structure, Dept. Computer Science, Seoul National University*
- **Software Engineer** 1/2000-6/2001  
*3Dmed(<http://www.3d-med.com/>), Seoul, South Korea*
- **Research Assistant** 3/1999-2/2001  
*Graphics Lab, Seoul National University*
- **Undergraduate Research Assistant** 3/1997-8/1998  
*Graphics Lab, Seoul National University*

#### Awards/Honors

(Fortunately, some of our work got notable recognitions, which are listed here.)

1. **Excellent class (우수수업), Center for Excellence in Learning and Teaching, KAIST 2020**  
 (Undergraduate) Computer Graphics, CS380, (online course due to COVID-19 w/ 100 students), School of Computing, spring semester, 2020
2. **Next-Generation Scientist Award (차세대과학자상) (in the category IT category), 2019**  
 The Korean Academy of Science and Technology (한국과학기술한림원) and S-Oil Science and Culture Foundation

----- Promoted to a full professor -----

3. **Technical Innovation Award (기술혁신상), College of Engineering, KAIST, 2018**
4. **Best Paper Awards at International and Domestic Conferences**
  - A. **Best paper honorable mention, 2018**  
 Feature Generation for Adaptive Gradient-Domain Path Tracing  
 Jonghee Back, [Sung-Eui Yoon](#), and Bochang Moon  
 Pacific Graphics (PG), Special Issue of Computer Graphics Forum, 2018
  - B. **Best paper in robotic planning, 2017**  
 Data Driven Kinodynamic RRT  
 Junghwan Lee, Heechan Shin and [Sung-Eui Yoon](#)  
 International Conference on Advanced Robotics (ICAR), 2017
  - C. **Best paper award at IPIU 2015**  
 Discovering Family Photo using Discriminative Frequent Subgraph  
 ChangMin Choi, YoonSeok Lee, [Sung-eui Yoon](#)  
 Workshop on Image Processing and Image Understanding (IPIU), 2015. 02, Korea,  
 poster presentation
5. **Research grant on sabbatical leave, LG Yonam Foundation, 2015**  
 Large-scale image search and its applications, [Sung-eui Yoon](#)
6. **Test-Of-Time 2006 Award at High Performance Graphics, 2015**

RT-DEFORM: Interactive Ray Tracing of Dynamic Scenes using BVHs  
 Christian Lauterbach, [Sung-eui Yoon](#), David Tuft, Dinesh Manocha  
 IEEE Interactive Ray Tracing, 2006

----- Promoted to a tenured professor -----

**7. Best Paper Awards at International and Domestic Conferences**

**D. Distinguished paper award at Pacific Graphics 2009**

HPCCD: Hybrid Parallel Continuous Collision Detection using CPUs and GPUs  
 DukSu Kim, JaePil Heo, Jaehyuk Huh, John Kim, and [Sung-Eui Yoon](#)

**8. Recognition of Service Awards**

- A. Association for Computing Machinery (ACM), 2013, USA  
 In Appreciation for Contributions to ACM, Paper Co-Chair, I3D `13,  
 B. Association for Computing Machinery (ACM), 2012, USA  
 In Appreciation for Contributions to ACM, Conf. Co-Chair, I3D `12

**9. Spotlight paper of the 2013, Sep. issue of IEEE TVCG**

Scheduling in Heterogeneous Computing Environments for Proximity Queries,  
 DukSu Kim, Jinkyu Lee, JungHwan Lee, Insik Shin, John Kim, and [Sung-eui Yoon](#)  
 IEEE Transaction on Visualization and Computer Graphics\* (TVCG), Vol. 19, No. 9, pp.  
 1513-1525, 2013 (Presented at ACM I3D 14)

**10. Selected as one of 100 representative research/development results (국가연구개발 우수성과 100선), National Science & Technology Commission (국가과학기술위원회), South Korea, 2011**

**Selected as one of 50 representative research results from National Research Foundation (NRF), 2011**

Random-Accessible Compressed Data and their Applications to Computer Graphics, Visualization, and Robotics, 2008 ~ 2011  
 PI: Sung-eui Yoon  
 (Note: NRF is Korean NSF)

----- Promoted to an associate professor -----

**11. IWON assistant professorship from KAIST**

3 year term title given to assistant professorship (only 9 assistant professors chosen across KAIST), Oct., 2010

**12. Invited Submission to IEEE Trans. on Visualization and Computer Graphics**

Selected papers from ACM Symp. on Solid and Physical Modeling 2008  
 ICCD: Interactive Continuous Collision Detection between Deformable Models using Connectivity-Based Culling  
 Min Tang, Sean Curtis, [Sung-Eui Yoon](#), and Dinesh Manocha

----- Joined KAIST as an assistant professor -----

**13. Invited Submission to IEEE Trans. on Visualization and Computer Graphics**

Selected papers from IEEE Visualization 2004

Quick-VDR: Out-of-Core View-Dependent Rendering of Gigantic Models

[Sung-Eui Yoon](#), Brian Salomon, Russell Gayle and Dinesh Manocha

**14. ILJU Foundation Scholarship for Advanced Studies, 2001-2005**

**Awards/Honors given to My Students**

(These are awards/honors given to my students. I listed them here, since these are based on works collaborated with me.)

**1. Samsung Humantech Paper Award**

**A. 3<sup>rd</sup> place, Computer Science and Engineering, Feb., 2017**

Representative recipient: Jaehyeong Cho

Rank-based Voting with Inclusion Relationship for Accurate Image Search

Jaehyeong Cho, Jae-Pil Heo, Taeyoung Kim, Bohyung Han and [Sung-Eui Yoon](#)

**A. 4<sup>th</sup> place, Computer Science and Engineering, Feb., 2016**

Representative recipient: Taeyoung Kim

Robust Illumination-Invariant Road Detection for Monocular Camera via Patch Propagation

Taeyoung Kim, Jaehyeong Cho, Yu-Wing Tai, and [Sung-eui Yoon](#)

**2. Outstanding Thesis Awards, KAIST**

Ph.D. Thesis: JungHwan Lee, 2015

MS Thesis: YoungWoon Lee, 2013, DongHyuk Kim, 2014

**3. Significant new researcher award, KCGS, 2014**

Representative recipient: Bochang Moon

**4. 3<sup>rd</sup> place at the graduate level in the Grand Finals**

ACM Award Banquet, ACM SRC, 2010

**1<sup>st</sup> place of ACM Student Research Competition Award (ACM SRC)**

ACM SIGGRAPH 2009

Representative recipient: TaeJoon Kim

RACBVHs: Random-Accessible Compressed Bounding Volume Hierarchies

TaeJoon Kim, Bochang Moon, Duksu Kim, and [Sung-Eui Yoon](#)

**5. Best programming award**

NVIDIA CUDA programming contest, Korea, 2010

Representative recipient: DukSu Kim

HPCCD: Hybrid Parallel Continuous Collision Detection using CPUs and GPUs

DukSu Kim, JaePil Heo, Jaehyuk Huh, John Kim, and [Sung-Eui Yoon](#)

**Books**

**1. Rendering**

1<sup>st</sup> edition, freely available at the internet

[Sung-eui Yoon](#)

July, 2018, about 148 pages

2. **Real-Time Massive Model Rendering**

Synthesis Lectures on Computer Graphics and Animation

[Sung-eui Yoon](#), Enrico Gobbetti, David Kasik, and Dinesh Manocha

2008, 122 pages

Morgan & Claypool Publishers

### Refereed Journal Publications

\* : *SCI (Science Citation Index)-listed journal*

+ : *SCI-E (Science Citation Index - Extended)-listed journals*

3. **Adaptive Incident Radiance Field Sampling and Reconstruction Using Deep Reinforcement Learning**

Yuchi Huo, Rui Wang, Ruzhang Zheng, Hualin Xu, Hujun Bao, and [Sung-eui Yoon](#)

ACM Trans. on Graphics (ToG), 2020 (Will be presented at SIGGRAPH 2020)

[Chosen as the cover image of the journal issue](#)

4. **Physically-inspired Deep Light Estimation from a Homogeneous-Material Object for Mixed Reality Lighting**

Jinwoo Park, Hunmin Park, [Sung-eui Yoon](#), and Woontack Woo

IEEE Transactions on Visualization & Computer Graphics (Will be presented at IEEE Virtual Reality), 2020

5. **Simultaneous Planning of Sampling and Optimization Study on Lazy Evaluation and Configuration Free Space Approximation for Optimal Motion Planning Algorithm**

Donghyuk Kim and [Sung-Eui Yoon](#)

Autonomous Robots\*, 2019

----- Promoted to a full professor -----

6. **Gradient Outlier Removal for Gradient-Domain Path Tracing**

Saerom Ha, Sojin Oh, Jonghee Back, Sung-Eui Yoon, and [Bochang Moon](#)

Eurographics (Computer Graphics Forum+), 2019

7. **Super Rays and Culling Region for Real-Time Updates on Grid-based Occupancy Maps**

Youngsun Kwon, Donghyuk Kim, Inkyu An, and [Sung-Eui Yoon](#)

IEEE Transactions on Robotics (T-RO)\*, 2019

8. **Distance Encoded Product Quantization for Approximate K-Nearest Neighbor Search in High-Dimensional Space**

Jae-Pil Heo, Zhe Lin, and [Sung-Eui Yoon](#)

IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)\*, 2018

9. **Feature Generation for Adaptive Gradient-Domain Path Tracing**

Jonghee Back, [Sung-Eui Yoon](#), and Bochang Moon

- Computer Graphics Forum+ (Pacific Graphics), 2018, vol 37, no 7, pp. 65 ~ 74  
**Received best paper honorable mention award**
10. **Rank-based Voting with Inclusion Relationship for Accurate Image Search**  
 Jaehyeong Cho, Jae-Pil Heo, Taeyoung Kim, Bohyung Han and [Sung-Eui Yoon](#)  
 CGI 2017 and a special issue of Journal The Visual Computer(TVC)+, Volume 33, Issue 6–8,  
 pp 1049–1059
  11. **Physically Inspired, Interactive Lightening Generation**  
 Jeongsu Yun, Myungbae Son, Byungyoon Choi, Theodore Kim, and [Sung-eui Yoon](#)  
 Journal Computer Animation and Virtual Worlds (CAVW), a special issue of CASA 2017,  
 vol 28, no 3~4
  12. **Memory-Efficient NBNN Image Classification**  
 YoonSeok Lee and [Sung-eui Yoon](#)  
 Journal of Computing Science and Engineering, 2017
  13. **TSS BVHs: Tetrahedron Swept Sphere BVHs for Ray Tracing Subdivision Surfaces**  
 Peng Du, YongJun Kim, [Sung-Eui Yoon](#)  
 Pacific Graphics (Computer Graphics Forum+), 2016
  14. **Adaptive Rendering with Linear Predictions**  
 Bochang Moon, Jose A. Iglesias-Guitian, [Sung-Eui Yoon](#), Kenny Mitchell  
 ACM SIGGRAPH (ACM Tran. on Graphics), 2015
  15. **Optimally Redundant, Seek-Time Minimizing Data Layout for Interactive Rendering**  
 Jia Chen, Shan Jiang, Zachary Destefano, [Sungeui Yoon](#), M. Gopi  
 The Visual Computer+, 2015
  16. **Relation based Bayesian Network for NBNN**  
 Mingyang Sun, YoonSeok Lee, [Sung-Eui Yoon](#)  
 Journal of Computing Science and Engineering, KIISE, 2015
  17. **Recursive Path Planning Using Reduced States for Car-like Vehicles on Grid Maps**  
 Sangyol Yoon, [Sung-Eui Yoon](#), Unghui Lee, and David Hyunchul Shim  
 IEEE Transactions on Intelligent Transportation Systems, 2015
  18. **Spherical Hashing: Binary Code Embedding with Hyperspheres**  
 Jae-Pil Heo, Youngwoon Lee, Jungfeng He, Shih-fu Chang, and [Sung-eui Yoon](#)  
 IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2015
  19. **Recent Advances in Adaptive Sampling and Reconstruction for Monte Carlo Rendering**  
 M. Zwicker, W. Jarosz, J. Lehtinen, B. Moon, R. Ramamoorthi, F. Rousselle, P. Sen, C.  
 Soler, and [S.-E. Yoon](#)  
 State of The Art Report, Eurographics (Computer Graphics Forum), 2015
  20. **Object tracking mask-based NLUT on GPUs for real-time generation of holographic  
 videos of three-dimensional scenes**  
 Min-Woo Kwon, Seung-Cheol Kim, [Sung-Eui Yoon](#), Yo-Sung Ho, Eun-Soo Kim  
 Optics Express, Vol. 23, Iss. 3, pp. 2101-2120, 2015

----- Promoted to a tenured professor -----

21. **Adaptive Rendering based on Weighted Local Regression**  
Bochang Moon, Nathan Carr, and [Sung-Eui Yoon](#)  
(Accepted at) ACM Transactions on Graphics\*, 2014 (planned to be presented at SIG. 15)
22. **Quadra-Embedding: Binary Code Embedding with Low Quantization Error**  
Youngwoon Lee, Jae-Pil Heo, and [Sung-eui Yoon](#)  
(Accepted at) Computer Vision and Image Understanding (CVIU), 2014  
Its earlier version was presented at Asian Conference on Computer Vision (ACCV), 2012  
(oral paper)
23. **Selective retraction-based RRT planner for various environments**  
Junghwan Lee, OSung Kwon, Liangjun Zhang, and [Sung-Eui Yoon](#)  
IEEE Transaction on Robotics\* (T-RO), 2014 (to appear)
24. **Metro Transit-Centric Visualization for City Tour Planning**  
Pio Claudio and [Sung-Eui Yoon](#)  
Computer Graphics Forum+ (the special issue on the Eurographics Conference on Visualization (EuroVis)), 2014
25. **T-ReX: Interactive Global Illumination of Massive Models on Heterogeneous Computing Resources**  
Tae-Joon Kim, Xin Sun, and [Sung-eui Yoon](#)  
IEEE Transaction on Visualization and Computer Graphics\* (TVCG), 2014  
Presented at ACM I3D 14
26. **Scheduling in Heterogeneous Computing Environments for Proximity Queries,**  
DukSu Kim, Jinkyu Lee, JungHwan Lee, Insik Shin, John Kim, and [Sung-eui Yoon](#)  
IEEE Transaction on Visualization and Computer Graphics\* (TVCG), Vol. 19, No. 9, pp. 1513-1525, 2013  
[Chosen as the spotlight paper for the September issue of IEEE TVCG](#)  
Presented at ACM I3D 14
27. **Robust Image Denoising using a Virtual Flash Image for Monte Carlo Ray Tracing**  
Bochang Moon, Jong Yun Jun, JongHyeob Lee, KunHo Kim, Toshiya Hachisuka, and [Sung-eui Yoon](#)  
Computer Graphics Forum+, Vol. 32, No. 1, pp. 139-151, 2013
28. **Probabilistic Cost Model for Nearest Neighbor Search in Image Retrieval**  
KunHo Kim, M. Hasan, Jae-Pil Heo, Yu-wing Tai, and [Sung-eui Yoon](#)  
Computer Vision and Image Understanding\*, 116, 2012, pp. 991-998
29. **A Mobile 3D Display Processor with A Bandwidth-Saving Subdivider**  
Seok-Hoon Kim, [Sung-eui Yoon](#), Sang-Hye Chung, Young-Jun Kim, Hong-Yun Kim, Kyusik Chung, Lee-Sup Kim  
IEEE Transactions on Very Large Scale Integration Systems (VLSI)\*, 2012
30. **VolCCD: Fast Continuous Collision Detection Culling between Deforming Volume Meshes**  
Min Tang, Dinesh Manocha, [Sung-eui Yoon](#), Peng Du, Jae-Pil Heo, Ruofeng Tong  
ACM Transactions on Graphics\*, 2011  
Presented at ACM SIGGRAPH 2012

----- Promoted to an associate professor -----

31. **Multi-Resolution Cloth Simulation**  
YongJoon Lee, [Sung-eui Yoon](#), SeungWoo Oh, DukSu Kim, Sungphee Choi  
Computer Graphics Forum+ (Pacific Graphics), 2010
32. **Cache-Oblivious Ray Reordering**  
Bochang Moon, YongYoung Byun, TaeJoon Kim, Pio Claudio, and [Sung-Eui Yoon](#)  
ACM Transactions on Graphics\*, Vol. 29, No. 3, 2010  
Presented at SIGGRAPH 2011
33. **HCCMeshes: Hierarchical-Culling oriented Compact Meshes**  
TaeJoon Kim, YongYoung Byun, Yongjin Kim, Bochang Moon, SeungYong Lee, [Sung-Eui Yoon](#)  
Computer Graphics Forum+ (Eurographics), vol. 29, no. 2, 2010
34. **HPCCD: Hybrid Parallel Continuous Collision Detection using CPUs and GPUs**  
DukSu Kim, JaePil Heo, Jaehyuk Huh, John Kim, and [Sung-Eui Yoon](#)  
Computer Graphics Forum+ (Pacific Graphics), vol. 28, no. 7, pp. 1791 - 1800, 2009  
[Received a distinguished paper award, equivalent to a best paper award in other conferences](#)
35. **RACBVHs: Random-Accessible Compressed Bounding Volume Hierarchies**  
TaeJoon Kim, Bochang Moon, Duksu Kim, and [Sung-Eui Yoon](#)  
IEEE Transaction on Visualization and Computer Graphics\* (TVCG), 2010  
[Its poster received 1st place award at ACM student research competition held at ACM SIGGRAPH 09](#)  
[It advanced to the Grand Finals and received 3<sup>rd</sup> place award at the graduate-level](#)
36. **ICCD: Interactive Continuous Collision Detection between Deformable Models using Connectivity-Based Culling**  
Min Tang, Sean Curtis, [Sung-Eui Yoon](#), and Dinesh Manocha  
IEEE Transaction on Visualization and Computer Graphics\* (TVCG), pp. 544-557, July/August 2009 (vol. 15 no. 4)  
[\(Invited submission to a special issue from papers of ACM SPM 08\)](#)
37. **ReduceM: Interactive and Memory Efficient Ray Tracing of Large Models**  
Christian Lauterbach, [Sung-Eui Yoon](#), Ming Tang, and Dinesh Manocha  
Computer Graphics Forum+, Vol. 27, No. 4, pp. 1313-1321 (and Eurographics Symp. on Rendering), 2008
38. **Adjacency-based Culling for Continuous Collision Detection**  
Min Tang, [Sung-Eui Yoon](#), and Dinesh Manocha  
The Visual Computer+, Vol. 24, No. 7, pp. 545-553 (Computer Graphics International Conf.), 2008
39. **Massive Model Rendering Techniques**  
Andreas Dietrich, Enrico Gobbetti, and [Sung-Eui Yoon](#)  
IEEE Computer Graphics and Applications\*, Vol. 26., No. 6 (Nov/Dec), pp. 20-34, 2007  
Special issue on Real-time interaction with complex models



----- Joined KAIST as an assistant professor -----

40. **Random-Accessible Compressed Triangle Meshes**  
 Sung-Eui Yoon and Peter Lindstrom  
 IEEE Transaction on Visualization and Computer Graphics\*, Vol. 13, No. 6, pp. 1536 – 1543  
 (and IEEE Visualization), 2007 (acceptance rate: 25%)
41. **R-LODs: Fast LOD-based Ray Tracing of Large Models**  
 Sung-Eui Yoon, Christian Lauterbach, and Dinesh Manocha  
 The Visual Computer+ (Pacific Graphics), Vol. 22, No. 9, pp. 772-784, (Oct.) 2006  
 (acceptance rate: 17%)
42. **Mesh Layouts for Block-Based Caches**  
 Sung-Eui Yoon and Peter Lindstrom  
 IEEE Transactions on Visualization and Computer Graphics\* (TVCG) (and IEEE  
 Visualization), Vol. 12, No. 5, pp. 1213-1220, (Nov.) 2006
43. **Cache-Efficient Layouts of Bounding Volume Hierarchies**  
 Sung-Eui Yoon and Dinesh Manocha  
 Computer graphics forum+, Vol. 25, No. 3 (Eurographics), pp. 507-516 , (Sep.) 2006  
 (acceptance rate: 17%)
44. **Cache-Oblivious Mesh Layouts**  
 Sung-Eui Yoon, Peter Lindstrom, Valerio Pascucci, and Dinesh Manocha  
 ACM Transactions on Graphics\* (ACM SIGGRAPH), Vol. 24, No. 3, pp. 886-893, 2005  
 (acceptance rate: 21%)
45. **Quick-VDR: Out-of-Core View-Dependent Rendering of Gigantic Models**  
 Sung-Eui Yoon, Brian Salomon, Russell Gayle and Dinesh Manocha  
 IEEE Transaction on Visualization and Computer Graphics\* (TVCG), Vol. 11, No. 4, pp. 369-  
 382, 2005  
[Invited submission to a special issue from papers of IEEE Visualization 04](#)
46. **Interactive Shadow Generation in Complex Environments**  
 Naga Govindaraju, Brandon Lloyd, Sung-Eui Yoon, Avneesh Sud and Dinesh Manocha  
 ACM Transactions on Graphics\* (ACM SIGGRAPH), 2003 (acceptance rate: 19%)

#### Refereed Conference Publications

47. **Adaptive Kernel Inference for Dense and Sharp Occupancy Grids**  
 Youngsun Kwon, Bochang Moon, Sung-Eui Yoon  
 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020
48. **Optimization-based Path Planning for Person Following using Following Field**  
 Heechan Shin, Sung-eui Yoon  
 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020
49. **TORM: Fast and Accurate Trajectory Optimization of Redundant Manipulator given an End-Effector Path**

- Mincheul Kang, Heechan Shin, Donghyuk Kim, [Sung-eui Yoon](#)  
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020
50. **Unsupervised Learning of Optical Flow with Deep Feature Similarity**  
Woobin Im, Tae-Kyun Kim, and [Sung-Eui Yoon](#)  
European Conference on Computer Vision (ECCV), 2020
51. **Robust Sound Source Localization considering Similarity of Back-Propagation Signals**  
Inkyu An, Byeongho-Jo, Youngsun Kwon, Jung-woo Choi, and [Sung-Eui Yoon](#)  
IEEE Int. Conf. on Robotics and Automation (ICRA), 2020
52. **Single Image Reflection Removal with Physically-Based Training Images**  
Soomin Kim, Yuchi Huo, and [Sung-Eui Yoon](#)  
Computer Vision and Pattern Recognition (CVPR), 2020  
[Oral presentation: acceptance rate of 5.7%](#)
53. **Real-time 3-D Mapping with Estimating Acoustic Materials**  
Taeyoung Kim, Youngsun Kwon, and [Sung-eui Yoon](#)  
IEEE/SICE International Symposium on System Integration (SII), 2020
54. **Learning Embedding of 3D models with Quadric Loss**  
Nitin Agarwal, [Sung-eui Yoon](#), and M Gopi  
British Machine Vision Conference (BMVC), 2019  
[Oral presentation: acceptance rate of 4.6%](#)
55. **An Objectness Score for Accurate and Fast Detection during Navigation**  
Hongsun Choi, Mincheul Kang, Youngsun Kwon, and [Sung-eui Yoon](#)  
The World Congress on Advances in Nano, Bio, Robotics and Energy (ANBRE), 2019
56. **Volumetric Tree\*: Adaptive Sparse Graph for Effective Exploration of Homotopy Classes**  
Donghyuk Kim, Mincheul Kang, and [Sung-Eui Yoon](#)  
IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS), 2019
57. **Harmonious Sampling for Mobile Manipulation Planning**  
Mincheul Kang, Donghyuk Kim, and [Sung-Eui Yoon](#)  
IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS), 2019

----- Promoted to a full professor -----

58. **Diffraction-Aware Sound Localization for a Non-Line-of-Sight Source**  
Inkyu An, Doheon Lee, Jung-woo Choi, Dinesh Manocha, and [Sung-Eui Yoon](#)  
IEEE Int. Conf. on Robotics and Automation (ICRA), 2019
59. **Coarse-to-Fine Clothing Image Generation with Progressively Constructed Conditional GAN**  
Youngki Kwon, Soomin Kim, Donggeun Yoo, and [Sung-Eui Yoon](#)  
International Conference on Computer Vision Theory and Application (VISAPP), 2019
60. **Scale-Varying Triplet Ranking with Classification Loss for Facial Age Estimation**  
Woobin Im, Sungeun Hong, [Sung-Eui Yoon](#), and Hyun S. Yang  
Asian Conference on Computer Vision (ACCV), 2018

61. **Kinodynamic Comfort Trajectory Planning for Car-like Robots**  
Heechan Shin, Donghyuk Kim and [Sung-Eui Yoon](#)  
IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS), 2018
62. **Regional Attention Based Deep Feature for Image Retrieval**  
Jaeyoon Kim and [Sung-Eui Yoon](#)  
British Machine Vision Conference (BMVC), 2018
63. **Adaptive Lazy Collision Checking for Optimal Sampling-based Motion Planning**  
Donghyuk Kim, Youngsun Kwon and [Sung-Eui Yoon](#)  
Int. Conf. on Ubiquitous Robots (UR) 2018
64. **Automated task planning using object arrangement optimization**  
Mincheul Kang, Youngsun Kwon and [Sung-Eui Yoon](#)  
Int. Conf. on Ubiquitous Robots (UR), 2018
65. **Dancing PRM\*: Simultaneous Planning of Sampling and Optimization with Configuration Free Space Approximation**  
Dongyuk Kim, Youngsun Kwon, and [Sung-Eui Yoon](#)  
IEEE Int. Conf. on Robotics and Automation (ICRA) 2018
66. **Reflection-Aware Sound Source Localization**  
Inkyu An, Myungbae Son, Dinesh Manocha, and [Sung-Eui Yoon](#)  
IEEE Int. Conf. on Robotics and Automation (ICRA) 2018
67. **Image Completion with Intrinsic Reflectance Guidance**  
Soomin Kim, Taeyoung Kim, Min H. Kim, [Sung-Eui Yoon](#)  
British Machine Vision Conference (BMVC), 2017
68. **Timeline Scheduling for Out-of-Core Ray Batching**  
Myungbae Son and [Sung-Eui Yoon](#)  
High Performance Graphics (HPG), 2017
69. **DDK-RRT: A Data Driven Kinodynamic RRT for continuous kinodynamic planning with complex dynamics**  
Junghwan Lee, Heechan Shin and [Sung-Eui Yoon](#)  
International Conference on Advanced Robotics (ICAR), 2017 (oral paper)  
[Received the best paper award in robotic planning](#)
70. **PCA based Computation of Illumination-Invariant Space for Road Detection**  
Taeyoung Kim, Yu-Wing Tai, [Sung-Eui Yoon](#)  
WACV 2017
71. **Anytime RRBT for Handling Uncertainty and Dynamic Objects**  
Hyunchul Yang, Jongwoo Lim, [Sung-Eui Yoon](#)  
IROS, 2016
72. **Shortlist Selection with Residual-Aware Distance Estimator for K-Nearest Neighbor Search**  
Jae-Pil Heo, Zhe Lin, Xiaohui Shen, Jonathan Brandt, [Sung-Eui Yoon](#)  
CVPR, 2016
73. **Super Ray based Updates for Occupancy Maps**  
Youngsun Kwon, Donghyuk Kim, [Sung-Eui Yoon](#)

ICRA, 2016

**74. Performance Driven Redundancy Optimization of Data Layouts for Walkthrough Applications**

Jia Chen, Shan Jiang, Zachary Destefano, [Sungeui Yoon](#), M. Gopi  
Computer Graphics International (CGI), 2015

----- Promoted to a tenured professor -----

**75. Out-of-Core Proximity Computation for Particle-based Fluid Simulations**

Duksu Kim, Myung-Bae Son, Young J. Kim, Jeong-Mo Hong, and [Sung-Eui Yoon](#)  
High Performance Graphics, 2014

**76. Distance Encoded Product Quantization**

Jae-Pil Heo, Zhe Lin, and [Sung-Eui Yoon](#)  
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2014

**77. PRISM: A System for Weighted Multi-Color Browsing of Fashion Products**

Donggeun Yoo, Kyunghyun Paeng, Sunggyun Park, Jungin Lee, Seungwook Paek, [Sung-Eui Yoon](#), and In So Kweon,  
Demo track of WWW 2014 (To appear) (acceptation ratio: 33%)

**78. PROT: Productive Regions-Oriented Task space path planning for hyper-redundant manipulators**

Junghwan Lee and [Sung-eui Yoon](#)  
IEEE International Conf. on Robotics and Automation (ICRA), 2014 (To appear)

**79. Cloud RRT\*: Sampling Cloud based RRT\***

Donghyuk Kim, Junghwan Lee, [Sung-Eui Yoon](#)  
IEEE International Conf. on Robotics and Automation (ICRA), 2014 (To appear)

**80. P-RPF: Pixel-based Random Parameter Filtering for Monte Carlo Rendering**

Hyosub Park, Bochang Moon, Soomin Kim, [Sung-Eui Yoon](#)  
CAD/Graphics, 2013

**81. VLSH: Voronoi-based Locality Sensitive Hashing**

Tieu Lin Loi, Jae-Pil Heo, Junghwan Lee, and [Sung-eui Yoon](#)  
IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS), 2013

**82. Stereotype-based Semantic Expansion for image retrieval**

Jungin Lee, OSung Kwon, Youngwoon Lee, and [Sung-eui Yoon](#)  
ICME (short paper), July, 2013

**83. Quadra-Embedding: Binary Code Embedding with Low Quantization Error**

Youngwoon Lee, Jae-Pil Heo, and [Sung-eui Yoon](#)  
Asian Conf. on Computer Vision (ACCV), Nov. 2012  
[Accepted as an oral paper, whose acceptance ratio is 4%](#)

**84. Spherical Hashing**

Jae-Pil Heo, Youngwoon Lee, Jungfeng He, Shih-fu Chang, and [Sung-eui Yoon](#)  
IEEE Conf. on Computer Vision and Pattern Recognition (CVPR), 2012, USA

**85. SR-RRT: Selective Retraction-based RRT Planner**

Junghwan Lee, OSung Kwon, Liangjun Zhang, and [Sung-eui Yoon](#)

IEEE International Conf. on Robotics and Automation (ICRA), May, 2012, USA

86. **IRIW: Image Retrieval based Image Watermarking for Large-Scale Image Databases**

Jong Yun Jun, KunHo Kim, Jae-Pil Heo, and [Sung-eui Yoon](#)

International Workshop on Digital-Forensics and Watermarking (IWDW), Oct. 2011

----- Promoted to an associate professor -----

87. **Data Management for SSDs for Large-Scale Interactive Graphics Applications**

Behzad Sajadi, Shan Jiang, Jae-Pil Heo, [Sung-Eui Yoon](#), M. Gopi,

ACM Symp. on Interactive 3D Graphics and Games (I3D), Feb, 2011

88. **FASTCD: Fracturing-Aware Stable Collision Detection**

Jae-Pil Heo, Joon-Kyung Seong, DukSu Kim, Miguel A. Otaduy, Jeong-Mo Hong, Min Tang, and [Sung-Eui Yoon](#)

ACM SIGGRAPH/Eurographics Symp. on Computer Animation (SCA), July, 2010

89. **Interactive Content-Aware Zooming**

Pierre-Yves Laffont, Jong Y. Jun, Christian Wolf, Yu-Wing Tai, Khalid Idrissi, George Drettakis, and [Sung-Eui Yoon](#)

Graphics Interface, 2010

90. **Bounds on the Geometric Mean of Arc Lengths for Bounded-Degree Planar Graphs**

Mohammad K. Hasan, [Sung-Eui Yoon](#), and Kyung-Yong Chwa

Frontiers of Algorithmics Workshop, 2009

91. **A Novel Page-Based Data Structure for Interactive Walkthroughs**

B. Sajadi, Y. Huang, P. Diaz-Gutierrez, [S.-E. Yoon](#), and M. Gopi

ACM SIGGRAPH Symp. on Interactive 3D Graphics and Games, (Feb.) 2009

92. **Interactive Continuous Collision Detection between Deformable Models using Connectivity-based Culling**

Min Tang, Sean Curtis, [Sung-Eui Yoon](#), and Dinesh Manocha

ACM Symp. on Solid and Physical Modeling, pp. 25-36, June, 2008

93. **Technical Strategies for Massive Model Visualization**

Enrico Gobbetti, David Kasik, and [Sung-Eui Yoon](#)

Proc. ACM Solid and Physical Modeling Symposium, pp. 405 – 415, 2008

----- Joined KAIST as an assistant professor -----

94. **Ray-Strips: A Compact Mesh Representation for Interactive Ray Tracing**

Christian Lauterbach, [Sung-Eui Yoon](#), and Dinesh Manocha

IEEE Symposium on Ray Tracing, pp. 19-26, (Sep.) 2007

95. **Ray Tracing Dynamic Scenes using Selective Restructuring**

[Sung-Eui Yoon](#), Sean Curtis, and Dinesh Manocha

Eurographics Symp. on Rendering, pp. 73-84, 2007

96. **RT-DEFORM: Interactive Ray Tracing of Dynamic Scenes using BVHs**

- Christian Lauterbach, [Sung-Eui Yoon](#), David Tuft, and Dinesh Manocha  
IEEE Symposium on Interactive Ray Tracing, pp. 39 – 45, Sep. 2006  
[Receive a Test-of-Time Award 2006 Award at HPG 2015](#)
97. **Warping and Partitioning for Low Error Shadow Maps**  
Brandon Lloyd, David Tuft, [Sung-Eui Yoon](#), and Dinesh Manocha  
Eurographics Symposium on Rendering, pp. 215 – 226, 2006
98. **Quick-VDR: Interactive View-Dependent Rendering of Massive Models**  
[Sung-Eui Yoon](#), Brian Salomon, Russell Gayle and Dinesh Manocha  
IEEE Visualization, pp. 131-138, 2004 (acceptance rate: 27%)  
[Nominated for a best paper](#)
99. **Fast Collision Detection between Massive Models using Dynamic Simplification**  
[Sung-Eui Yoon](#), Brian Salomon, Ming Lin, and Dinesh Manocha,  
ACM SIGGRAPH/Eurographics Symposium on Geometry Processing (SGP), pp. 136 – 146,  
2004, Nice, France (acceptance rate: 29%)
100. **Interactive View-dependent Rendering with Conservative Occlusion Culling in Complex Environments**  
[Sung-Eui Yoon](#), Brian Salomon and Dinesh Manocha,  
IEEE Visualization, 2003, Seattle, USA (acceptance rate: 32%)
101. **Interactive Visibility Culling for Large Environment using Occlusion-Switches**  
Naga Govindaraju, Avneesh Sud, [Sung-Eui Yoon](#), and Dinesh Manocha  
Proc. ACM Symposium on Interactive 3D Graphics (I3D), 2003 (acceptance rate: 26%)

#### Miscellaneous Publications

102. **Ray Distribution to Parallel Batching-based Updates**  
Youngsun Kwon and [Sung-Eui Yoon](#)  
ICRA2017 Workshop on Robotics and Vehicular Technologies for Self-driving cars
103. **Web-Scale Image Retrieval and Its Novel Applications**  
[Sung-eui Yoon](#)  
Web Science Track, World Wide Web (WWW), 4 pages, 2012, France
104. **Recent Research Trends of Interactive Massive Model Visualization**  
(대용량 모델 가시화 기술의 최신 연구 동향)  
[Sung-Eui Yoon](#)  
CAD/CAM Review, Korean CAD/CAM (한국 CAD/CAM 학회지), Vol. 15, No. 1, 2009  
Written in Korean
105. **Parallel Occlusion Culling for Interactive Walkthroughs using Multiple GPUs**  
Naga Govindaraju, Avneesh Sud, [Sung-Eui Yoon](#), and Dinesh Manocha  
Workshop on Commodity-Based Visualization Clusters (CCViz02), 2002

### Domestic Publications

1. **고성능 근접 연산과 이의 응용 (High Performance Proximity Computing and Applications)**  
[윤성의](#)  
 정보과학회지, 2016, 2월
2. **Discovering Family Photo using Discriminative Frequent Subgraph**  
 최창민, 이윤석, [윤성의](#)  
 영상처리 및 이해에 관한 워크샵 (IPIU), 2015. 02  
 우수논문상 수상 (포스터 발표 부문)
3. **컴퓨터 그래픽스 연구 현황: 1부 실세계로의 접근 (Research Overview of Computer Graphics: Achieving Realism)**  
[윤성의 \(Sung-eui Yoon\)](#), 이승용, 이제희, 임인성, 정규만  
 한국컴퓨터그래픽스 학회, Vol 18, No. 2, P. 17~33, 2012
4. **3D 텍스처 매핑 하드웨어 하에서 법선 벡터 블렌딩을 이용한 가속화된 볼륨 렌더링 (Accelerated Volume Rendering based on 3D Texture Mapping Hardware using Normal Blending)**  
[윤성의 \(Sung-eui Yoon\)](#) and 신영길  
 정보과학회논문지, 2001

### Patents

1. **Multi-Resolution Cloth Simulation Method Using Simplified Linear System**  
 YongJoon Lee, [Sung-eui Yoon](#), SeungWoo Oh, DukSu Kim, Sungphee Choi  
 10-1215441, South Korea, filed at 2011.03 and issued at 2012.12.18
2. **System and Method for Image Retrieval based Image Watermarking**  
 JongYun Jeon, JaePil Heo, Kunho Kim, [Sung-Eui Yoon](#)  
 10-1206275-00-00, South Korea, filed at 2010.12 and issued at 2012.11.23
3. **Parallel Collision Detection Method based on Inter Collision Detection and Computer Readable Media**  
 DukSu Kim, JaePil Heo, Jaehyuk Huh, John Kim, and [Sung-Eui Yoon](#)  
 10-1084980, South Korea, filed at 2009.08 and issued at 2011.11.14
4. **Hybrid Parallel Collision Detection using Multi-Core CPUs and GPUs.**  
 DukSu Kim, JaePil Heo, Jaehyuk Huh, John Kim, and [Sung-Eui Yoon](#)  
 10-1013784, South Korea, filed at 2009.8.31 and issued at 2011.02.01

### Workshop and Courses/Tutorials at Conferences

**1. Sound Source Localization and Its Applications**Main organizer: [Sung-eui Yoon](#)

A workshop at ICRA 2019

A tutorial at KROS, 2020 (canceled due to COVID-19)

**2. Heterogeneous Parallel Computing for Computer Graphics**Speakers: [Sung-eui Yoon](#) and Duksu Kim, KSC 2018**3. Recent Image Search Techniques**i. Speakers: [Sung-eui Yoon \(organizer\)](#) and Zhe Lin, IEEE CVPR 2016**4. Open SWs related to Rendering, Image Search, and Motion Planning**ii. Speakers: [Sung-eui Yoon \(organizer\)](#), DongHyuk Kim, YoonSeok Lee, ByungYoon Choi, Korea HCI, Jan., 2016

iii. Demo presentations, KCC, June, 2015

**5. Recent Advances in Image Space Adaptive Sampling and Reconstruction**iv. Speakers: Pradeep Sen, Matthias Zwicker, Fabrice Rousselle, [Sung-eui Yoon](#), Nima Tutorial, ACM SIGGRAPH 15v. Zwicker, W. Jarosz, J. Lehtinen, B. Moon, R. Ramamoorthi, F. Rousselle, P. Sen, C. Soler, and [S.-E. Yoon](#)

STAR talk, State of The Art Report, EG (CGF), 2015

----- Promoted to a tenured associate prof. -----

**6. Large-Scale Image Search and Classification**vi. Lecturer: [Sung-eui Yoon](#)National Association of Cognitive Science Industries (NACSI,  
한국인지과학산업회), Dec. 2014vii. Lecturer: [Sung-eui Yoon](#)

Machine Learning School, KISSE, Aug., 2014

**7. Robot motion planning and applications**Organizer: [Sung-eui Yoon](#)Lecturers: David Shim, Sunghee Lee, Young J. Kim, and Sung-eui Yoon  
KROS (Korea Robotic Society), 2014**8. High-quality rendering**viii. Lecturer: [Sung-eui Yoon](#)

Summer School, KCGS, 2014

ix. Organizer: [Sung-eui Yoon](#)Lecturers: Insung Im, Kiju Park, and [Sung-eui Yoon](#)  
(Discussed rendering for digital contents)

Korea HCI, 2013

**9. GPU workshop**

Organizer: Young J. Kim

Lecturers: H.G. Ryu, T.Y. Kim, T.H. Lee, I.K. Park, J.K. Seong, J.J. Lee, and [S.-E. Yoon](#)  
Korea Computer Graphics Society, June, 13 and



Korea HCI, 2013

#### 10. Recent Advances in Real-Time Collision and Proximity Computations for Games and Simulations

- x. Organizer: [Sung-eui Yoon](#)  
Lecturers: Erwin Courmans, Stephen Frye, Takahiro Harada, and [Sung-eui Yoon](#)  
Eurographics 2012

----- Promoted to an associate professor -----

- xi. Organizer: [Sung-eui Yoon](#) and Young J. Kim  
Lecturers: Takahiro Harada, Young J. Kim, [Sung-eui Yoon](#)  
ACM SIGGRAPH Asia 2010
- xii. Organizer: [Sung-eui Yoon](#) and Dinesh Manocha  
Lecturers: Erwin Courmans, Richard Tonge, Dinesh Manocha, Young J. Kim, [Sung-eui Yoon](#)  
ACM SIGGRAPH 2010

#### 11. Interactive Massive Model Rendering

- i. Organizer: [Sung-eui Yoon](#) and David Kasik  
Lecturers: E. Gobbetti, D. Kasik, D. Manocha, R. Pajarola, P. Slusallek, and [S-E, Yoon](#)  
IEEE Visualization 2009
- ii. Organizer: [Sung-eui Yoon](#)  
Lecturers: A. Dietrich, E. Gobbetti, D. Manocha, F. Marton, R. Pajarola, P. Slusallek, [S-E, Yoon](#)  
ACM SIGGRAPH Asia 2008
- iii. Organizer: David Kasik  
Lecturers: A. Dietrich, E. Gobbetti, D. Manocha, F. Marton, P. Slusallek, A. Stephens, [S-E, Yoon](#)  
ACM SIGGRAPH Class, 2008
- iv. Lecturers: Enrico Gobbetti, David Kasik, and [Sung-Eui Yoon](#)  
Mini-Symposium, Proc. ACM Solid and Physical Modeling Symposium 08  
**Offered in a plenary session**
- v. Organizer: David Kasik  
Lecturers: B. Bruderlin, W. Correa, A. Dietrich, E. Gobbetti, D. Manocha, F. Marton, I. Quilez, P. Slusallek, A. Stephens, [S-E, Yoon](#)  
ACM SIGGRAPH Course, 2007

----- Joined KAIST as an assistant professor -----

- vi. D. Kasik, D. Manocha, [S. Yoon](#), A. Stephens, B. Bruderlin, P. Slusallek, A. Dietrich, E. Gobbetti, F. Marton, W. Correa, I. Quilez  
Eurographics 2006, Vienna, Austria

**12. State of the Art in Interactive Ray Tracing**

Course presenter

ACM SIGGRAPH Course, 2006

**Invited Talks/ Presentations****1. Scalable Graphics, Vision and Robotics**

A. SungName Leadership Vision, Aug

**2. Deep Learning and Physically-based Rendering**

A. Keynote talk, KCGS, 2020

**3. Sound Source Localization and Its Applications to Robotics**

A. SungNam-KAIST Tech. Transfer Workshop, Dec. 2019

B. MSRA, Nov. 2019

----- Promoted to a full professor -----

**4. Sound Source Localization and Its Applications to Robotics**

A. Eoen elementary school, Apr, 2019

B. School of Computing, KAIST, Mar 2019

C. KRISO, Jan, 2019

**5. Web-Scale Image Retrieval and Its Novel Applications**

a. Adobe, 2018

b. Science high school, DaeJeon, 2017

c. IWRCV, Korea, Dec., 2016

d. Google Research, USA, June, 2016

e. SAIT, May, 2016

**6. Scalable Graphics/Geometric Algorithms**

a. Lawrence Livermore National lab, Feb, 2018

b. Univ. of California, Irvine, Oct., 2017

c. GIST, Apr, 2017

d. (Simplified version) Elementary school, Mar, 2017

e. Ewha Univ., Nov, 16

f. Pixar, USA, June, 16

g. Hanyang Univ., Feb., 16

h. ETRI, Feb., 16

i. Shonan Meeting on Big Data Visual Analytics, Nov., Japan 15

j. KAIST-MADALGO workshop, June, 15

**7. Scalable Techniques for Virtual Reality and Training**

a. Korea Industrial Education Institute, Feb., 16

- b. Industry Forum for Virtual Training Systems, Seoul, Dec., 15

----- Promoted to a tenured professor -----

#### **8. Web-Scale Image Retrieval and Its Novel Applications**

- a. Hanyang Univ., Apr.-22, 2013
- b. Big data center, ETRI, Jan., 2013
- c. ETRI, Sep., 2012

#### **9. Scalable Graphics/Geometric Algorithms**

- a. Big Data Workshop, HongKong, 14
- b. Collaborative Conf. on 3D & Material Research, June, 13
- c. Korea Computer Graphics Society (KCGS), June, 2013
- d. Samsung Heavy Industry, Apr, 2013
- e. US-Korea Conference on Science, Technology, and Entrepreneurship (UKC), Aug, 2012
- f. Korea Univ., May, 2012
- g. GIST, Apr, 2012
- h. The First Wednesday Multidisciplinary Forum (EEWS & CS), KAIST, Jan, 2012
- i. Seoul National Univ., Nov, 2011
- j. SungKunKwan Univ., Oct., 2011
- k. INUS Technology, Inc., Korea, Sep., 2011

#### **10. Collision Detection for Large-Scale Deforming Models**

- a. GPU Technology Conference (GTC), USA, 2013
- b. (Korean) HCI, Korea, Jan-27, 2010

#### **11. High-Performance Rendering using Heterogeneous Resources**

- a. Collaborative Conf. on 3D & Material Research, June, 14

----- Promoted to an associate professor -----

#### **12. Scalable Graphics/Geometric Algorithms**

- a. CSAIL, MIT, Feb., 2011
- b. DDRSoft, Korea, Oct., 2010
- c. Korea Game Conference, Sep., 2010
- d. National Cheng-Kung Univ. Taiwan, Aug., 2010
- e. DigitalAria, South Korea, Apr-21, 2010
- f. Univ. of North Carolina at Chapel Hill, USA, 2009
- g. e-Heritage, Microsoft Research Asia, Beijing, China, 2008
- h. Polytechnic univ., NY, USA, 2008
- i. POSTECH, Apr., 2008
- j. Samsung Advanced Institute of Technology (SAIT), Dec., 2007
- k. Korea University, Nov, 2007

- l. Dept. of CS Colloquium, KAIST, Oct 2007
- m. Electronics and Telecommunications Research Institute (ETRI), Oct 2007
- 13. Scalable Graphics Algorithms and their Applications to Content Creations**  
International Symp. for Arts and Contents, Korea, 2009
- 14. Scalable Rendering of Large-Scale eHeritage Data**  
e-Heritage, Microsoft Research Asia, Dun Huang China, 2009
- 15. Interactive Photo-Realistic Rendering**
  - a. Samsung Tech. Conference, 2009
  - b. Samsung Tech. Conference, 2008
- 16. Interactive Massive Model Rendering using GPUs**
  - a. Korea Computer Congress (KCC) GPU Workshop, 2009 and 2008
  - b. NVIDIA Round Table Meeting, Seoul, Korea, 2008
- 17. Cache-Coherent Layouts of Meshes and Graphs**
  - a. Korean symposium on CAD/CAM, Dec, 2007
  - b. Workshop on Edge Computing Using New Commodity Architectures, 2006 (Poster)
  - c. Workshop of Massive Geometric Data Sets 05 (in connection with Sym. of Computational Geometry 05)
- 18. LOD techniques for Ray Tracing**
  - a. Electronics and Telecommunications Research Institute (ETRI), Feb., 2008
- 19. Interactive Physically-based Cloth Simulation**
  - a. Samsung Advanced Institute of Technology (SAIT), Mar., 2008

----- Joined KAIST as an assistant professor -----

- 20. Ray Tracing Dynamic Scene using Selective Restructuring**  
[Sung-Eui Yoon](#), Sean Curtis, and Dinesh Manocha  
ACM SIGGRAPH Sketch, 2007, USA (acceptance rate: 19%)
- 21. R-LODs: Fast LOD-Based Ray Tracing of Massive Models**  
[Sung-Eui Yoon](#), Christian Lauterbach and Dinesh Manocha  
ACM SIGGRAPH Sketch, 2006, Boston, USA (acceptance rate: 23%)
- 22. Quick-VDR: Interactive View-Dependent Rendering of Massive Models on Commodity GPU**
  - a. ACM SIGGRAPH Sketch, 2004, LA, USA.
  - b. ACM Workshop on General Purpose Computing on Graphics Processors, 2004, (Poster)
- 23. Parallel Occlusion Culling for Interactive Walkthroughs using Multiple GPUs**  
Naga Govindaraju, Avneesh Sud, [Sung-Eui Yoon](#), and Dinesh Manocha  
Workshop on Commodity-Based Visualization Clusters (CCViz02), 2002

### Software System

We aim to release most of our research results as open source projects. As a result, there are too many such open source projects and systems. We thus list some of old results here.

1. **T-Rex source codes** (2014): source codes of performing interactive photon mapping for massive models using heterogeneous computing resources
2. **Hashing codes** (2012): Codes generating binary codes based on Spherical Hashing and Quadra Embedding  
(over 150 download during the first year from its released year, 2012)
3. **OpenCCD** (2009): A library that performs continuous collision detection while utilizing heterogeneous many-core architectures including CPUs and GPUs  
(over 130 download between 2010 and 2013)
4. **OpenRAM** (2007): A library supporting random accesses on the compressed triangle meshes  
(over 100 download during Oct. 2007 ~ July, 2010)
5. **OpenCCL** (2005): A library that computes cache-coherent layouts of meshes and graphs  
(Over 300 downloads during Aug, 2005 ~ 2009)

#### **Media Coverage and Selected Cover Image**

1. Some of our AI related projects, Electronic newspaper, 2017
2. Image-space adaptive rendering, KAIST breakthrough, 2016
3. 2013 Annual R&D Report, KAIST: Our heterogeneous parallel computing techniques were chosen as research highlights of 2013 and covered in the Annual R&D Report, May, 2014
4. Ray tracing results for the Boeing company, LiveScience (in cooperation with the (U.S.A.) National Science Foundation), Mar – 23. 2010
5. An image of a cloth simulated by our multi-resolution cloth simulation method, front cover, Pacific Graphics, 2010
6. An image of N-body simulation that is powered by hybrid parallel continuous collision detection, back cover, Pacific Graphics, 2009
7. Recent Research Results of SGLab., KAIST Times, Dec. 2009
8. BVHs and Memory Coherence, Ray tracing news, Vol 19, No 1, September 2006,
9. Cache-Oblivious Mesh Layout, a part of ACM SIGGRAPH technical video, Electronic Theater, 2005
10. A complex view of an iso-surface model extracted from a turbulence simulation, front cover, IEEE Visualization proceeding 2004
11. Interactive Shadow Generation in Millimeter Magazine, June 2003
12. Realistic Shadow Generation in ExtremeTech Magazine, April 2003

#### **Consulting / External Lecture**

1. Multi-resolution simulation, rendering, and path planning  
Simnet (Simulation company), Mar, 2020
2. Educational Demands for Parallel Computing  
KORETECH, Dec. 2018
3. Unsupervised learning  
KAIST AI, July, 2018

4. Research trends on large-scale visualization methods and system  
KISTI, Apr., 2017
5. Path planning problems for security checks  
A Korean gov. safety related lab. Apr., 2017
6. GPU Computing  
Korean Intellectual Property Office (특허청), Nov., 2012
7. Remote Large-Scale Rendering  
KISTI (Korea Institute of Science and Technology Information), Aug, 2010
8. Introduction to Computer Graphics  
ETRI, May~July, 2010  
ETRI, Oct.~Nov., 2009
9. Interactive Photo-Realistic Rendering  
Samsung Electronics, Nov., 2008 ~ Oct., 2009

### **Contracts and Grants**

Total external funding: 1,015M Korean Won (2007 ~ 2010)

#### **Current support:**

1. High Performance Humanoid, KEIT, 200M won (\$200K) per year, co-PI, 2017~2021
2. Next Generation IT on Holo-portation, NRF, 150M won (\$150K) per year, co-PI, 2017~2020
3. Multi-resolution modeling, ADD, 100M won (\$100K) per year, co-PI, 2017 ~ 2018
4. SW StarLab on proximity computing, IITP, 300M won (\$300K) per year, PI, 2015~2022
5. Accurate Image Search, NAVER, 100M won (\$100K), PI, 2017
6. Identifying Fire Sensor Locations, Samsung Heavy Industry, 20M won (\$20K), PI, 2017
7. Multi-resolution modeling and simulation (M&S), ADD, 50M won (\$50K) per year, PI, 2011 ~ 2015
8. Cache-friendly algorithms for large-scale model rendering, NRF, 50M won (\$50K), PI, 2013~2016
9. Exo-brain, MKE/KEIT, 80M won (\$80K) per year, co-PI, 2013~2017
10. HoloDigilog Human Media Research Center, ERC, NRF, 50M won (\$50K) per year, co-PI, 2011~2016
11. Small or gift funding from Samsung Heavy Industry and Adobe (USA), PI, 2012~

#### **Pending:**

#### **Past support:**

1. Next-Generation Image Systems, Samsung, 80M won (\$80K) per year, PI, 2012~2015
2. Development of Total VFX Simulation Techniques based on Lego-style modular design, MKE/KEIT, 2011~2014, 200M won (\$200K) per year
3. A Semi-Realtime Renderer for High Quality CG Contents based on Multiple CPU/GPU

- MKE/KEIT, 200M won (\$200K) per year, 2010~2012
4. Development of real-time physics simulation engine for e-entertainment, MKE/IITA, co-PI, 2008~2010, 370M won (\$370K)
  5. Efficient pattern mask generation for digital lithography, MKE, PI, 2009 ~ 2011, approximately 120M won (\$120K)
  6. Random-accessible compressed data and their applications, Korea Research Foundation (KRF), PI, 2008~2011, approximately 100M won (\$100K)
  7. Adaptive techniques for U-Learning, ETRI, MKE/IITA, PI, 2008~2010, 90M won (\$90K)
  8. Detecting forgery in 3D contents, co-PI, 2009 ~ 2010, MCST/KOCCA, 30M won (\$25K)
  9. Interactive Global Illumination of Massive eHeritage Data, Microsoft Research Asia, PI, \$20K, 2009
  10. Efficient Rendering, PI, 2009, ETRI, MKE/MCST/IITA, 30M won (\$25K)
  11. Fur Rendering, PI, 2009, ETRI, MCST/KEIT, 40M won (\$30K)
  12. Scalable Graphics/Geometric Algorithms, PI, 2007~2009, KAIST seed grant, 250M won (\$250K)
  13. Seed grant, 2007 ~ 2008, PI, LG, 19M won (\$19K)
  14. Cloth Simulation, 2007, co-PI, ETRI, 50M won (\$50K)

### Professional Activities

- Professional memberships
  - Korean Institute of Information Scientists and Engineers (KIISE, 한국정보과학회), Life-time member
  - IEEE & IEEE Computer Society: IEEE Senior member since Dec.-18, 2013
  - ACM and ACM SIGGRAPH: ACM Senior member since July, 2018
  - Eurographics
  - Korea Computer Graphics Society (KCGS)
- Journal editorship
  - Associate editor, IEEE Transactions on Emerging Topics in Computing, 2020~
  - Subject Area Editor, International Journal of High Performance Computing Applications (IJHPCA), 2016~
  - Associate editor, Graphical Models, 2015 ~ present
  - Associate editor, Journal of Computing Science and Engineering (JCSE), KIISE, 2015 ~ present
  - Associate editor, The Visual Computer, 2011 - 2016
  - Member of editorial board of Korea Computer Graphics Society, 2008 – present
- Conf. chair
  - ACM Symp. on Interactive 3D Graphics and Games, 2012 (conf. co-chair)
- Paper chair
  - ACM Symp. on Interactive 3D Graphics and Games, 2013 (paper co-chair)
- Award committee:
  - Nomination endorsement for Prof. Tomoyuki Nishita for the life time achievement

award at Asia Graphics, 2017

- Significant new researcher award (우수신진상), KCGS, 2011 ~
- Program committee member:
  - AAAI Conf. on Artificial Intelligence: 19
  - ACM SIGGRAPH Asia: 09
  - ACM Solid and Physical Modeling Symposium: 07, 08
  - ACM Symp. on Interactive Graphics and Games: 14~19
  - ACM Symp. on Virtual Reality Software Technology: 14
  - ACM International Web 3D Conference: 14
  - Computational Visual Media Conference (CVM): 13
  - Eurographics: 12 (short papers)
  - Eurographics Symposium on Rendering: 16~17, 19
  - (Korea) HCI: 08 ~ 19
  - High-Performance Graphics: 09~10, 14~18
  - IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS): 12
  - IEEE Pacific Visualization 12, 15~16
  - IEEE Symposium on Interactive Ray Tracing: 07
  - IEEE Visualization: 09, 10, 11
  - IEEE Virtual Reality: 11
  - IEEE Virtual Reality Workshop on Virtual Cityscapes: 08
  - Pacific Graphics: 09 ~ 18
  - Robotics Science and Systems (RSS): 14
  - Workshop on Massive Data Algorithmics (MASSIVE): 12
- Poster chair
  - ACM Interactive 3D Graphics and Games, 2011
- (Served as) Referee for:
  - ACM SIGGRAPH and SIGGRAPH Asia
  - ACM Solid and Physical Modeling Symposium
  - ACM Symposium of Interactive 3D Graphics
  - ACM Transactions on Graphics
  - Computer-Aided Design
  - Eurographics
  - Eurographics Symposium of Geometric Processing
  - Eurographics Symposium of Rendering
  - Graphics Hardware
  - Graphics Interface
  - IEEE Int. Conf. on Robotics and Automation (ICRA)
  - IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)
  - IEEE Virtual Reality
  - IEEE Visualization
  - IEEE Transaction on Automation Science and Engineering
  - IEEE Transaction on Visualization and Graphics



- IEEE Symposium on Interactive Ray Tracing
- Information Processing & Management
- International conf. on computer vision (ICCV)
- Pacific Graphics
- The Visual Graphics, etc.

### **Teaching**

Note: I report teaching evaluations for some of courses; the perfect teaching evaluation score is 5 and (X/Y) indicates X ranked out of Y classes in terms of teaching evaluation score.

1. Image Retrieval (Taught in English)
  - Fall 2011 (4.72, 2/65)
2. Motion Planning and Applications (Taught in English)
  - F11 (4.67, 4/65), Fall 2009 (N/A)
3. Advanced Rendering (Taught in English)
  - F10 (4.44, 14/58), Fall 2008 (N/A)
4. Graduate-level Computer Graphics, CS580, Taught in English
  - S13 (4.3, 19/59)
5. Introduction to Computer Graphics, CS380 (previously CS480), (Taught in English)
  - S12 (4.4, 12/62), S11 (4.46, 9/56), S10 (4.54, 14/61), Spring 2009 (N/A), Spring 2008 (N/A)
6. Topics in Computer Graphics: Scalable Graphics/Geometric Algorithms (Taught in English)
  - Fall 2007 (N/A)

### **Graduate Students**

#### **Currently supervised**

##### **Ph.D. course**

1. Donghyuk Kim
2. Soomin Kim
3. Yongsun Kwon
4. Taeyoung Kim
5. Mincheol Kang
6. Inwoo Ha
7. Inkyu Ahn
8. Woobin Im
9. HeeChan Shin

##### **M.S. course**

(see the homepage of our lab.)

#### **Supervised in the past**

##### **Ph.D. course**

1. DongHyuk Kim, 2019
2. Pio Claudio, 2016
3. JaePil Heo, 2015

4. BooChang Moon, 2014
5. DukSu Kim, 2014
6. JungHwan Lee, 2014
7. TaeJoon Kim, 2013

**M.S. course**

(see the homepage of our lab.)

**Postdoctorate**

1. Peng Du, 2015

**Ph.D. Committees****Committee chair (my advisee)**

1. DongHyuk Kim, CS, KAIST, June, 2019
2. Pio Claudio, CS, KAIST, Nov., 2016
3. Jaepil Heo (허재필), CS, KAIST, Feb. 2015
  - Compact Representation of High-Dimensional Data for Large-Scale Image Search
4. Bochang Moon (문보창), CS, KAIST, May, 2014
  - Acceleration techniques for Monte Carlo Ray Tracing
5. Duksu Kim (김덕수), CS, KAIST, May, 2014
  - Heterogeneous Parallel Computing for Proximity Queries
6. JungHwan Lee (이정환), CS, KAIST, May, 2014
  - Sampling-based motion planning algorithm to handle a narrow passage problem
7. TaeJoon Kim (김태준), CS, KAIST, May, 2013
  - Interactive global illumination of non-deformable massive models

**Committee member**

8. YoungSik Shin (신영식), Dept. of Construction and Env., KAIST, Nov, 2019
  - Multi modal perception for all day visual SLAM, AhYoung Kim (advisor)
9. Inju Na (나인주), CS, KAIST, Nov, 2019
  - IRSharing, Multiple Regular Path Query Processing using an Intermediate Representation, Kyuhyung Whang (advisor)
10. SooHwan Song (송수환), CS, KAIST, Nov, 2019
  - View Path Planning for Online 3D Modeling using Micro Aerial Vehicles, SungHo Cho (advisor)
11. SooMin Cho (조수민), CS, KAIST, June, 2019
  - Robot Task Motion Generation based on Imitation Learning and Motion Composition, SungHo Cho (advisor)
12. GilJoo Nam (남길주), CS, KAIST, June, 2019
  - Image-based Modeling for High-quality 3D Geometry and Reflectance, Min H. Kim (advisor)
13. JinWon Park (박지원), CS, KAIST, June, 2019
  - Optimal Geometric Representations of Graphs and Triangles, Otfried Cheong (advisor); I was a co-advisor
14. DooYoung Kim (김두영), CS, KAIST, Dec, 2018
  - Design and Calibration of Soft Wearable Sensors for Human Motion, SungHo Cho (advisor)

15. MyungHee Han (한명희), CS, KAIST, May, 2018
  - Detection of Three-dimensional Information of Blood and Lymphatic Vessels in Optical Coherence Tomography Images, Sukeyoung Ryu (advisor)
16. SungHum Kim (김성흠), EE, KAIST, Nov., 2017
  - Object Representation and Segmentation Methods for Industrial Applications, Inso Kwon (advisor)
17. Jongbin Ryu (유종빈), CS, KAIST, Nov., 2016
  - Texture image classification: From rotation-invariant handcraft feature to spatial orderless deep feature representation, HyunSeung Yang (Advisor)
18. HongGu Lee (이홍구), CS, KAIST, Apr., 2016
  - Traversable Region Detection for Autonomous Robot: Towards Reducing Humans Supervision, SungHo Jho (Advisor)
19. DukMin Ham (함덕민), CS, KAIST, May, 2015
  - Efficient Filtering and Result Refinement for Large Scale Image Databases, MyungHo Kim (Advisor)
20. JuYoung Yeon (연주영), CS, KAIST, May, 2015
  - Geometric Matching Problems, Otfried Cheong (Advisor)
21. JaeIl Kim (김재일), CS, KAIST, Oct., 2014
  - A Template Model-based Shape Morphometry :focused on the Brain Subcortical and Ventricular Structures, JinAh Park (Advisor)
22. DongHun SaGong (사공동훈), CS, KAIST, May, 2014
  - A physics-based approach to generating mixing patterns for miscible liquids, SungYong Shin (Advisor)
23. DaSung Han (한다성), CS, KAIST, May, 2014
  - On-line Real-time Physics-based Motion Synthesis based on Low-dimensional Model Predictive Control and Motion Transformation, SungYong Shin (Advisor)
24. SangWook Yu (유상욱), CS, KAIST, May, 2013
  - Analysis of Education Effects on Cognitive Reserve based on Network Flow, SungYong Shin (Advisor)
25. TaeKwon Jang (장태권), CT, KAIST, Nov., 2012
  - Water simulations with multilevel vorticity and rich surface details, JunYong Noh (Advisor)
26. MK Hasan, CS, KAIST, Nov, 2012
  - Approximation algorithms for facility location and graph partitioning problems, Kyungyong Chwa (Advisor)
27. Hoeryong Jung (정희룡), ME, KAIST, May, 2012
  - Real-time cutting simulation of deformable objects using meshless method, DoYong Lee (Advisor)
28. YongJoon Lee (이용준), CS, KAIST, Apr, 2012
  - Efficient multi-resolution cloth simulation and automated fitting method of cloth model, SungHee Choi (Advisor)
29. ManMyung Kim (김만명), CS, Seoul National Univ., Dec., 2011
  1. Multiple character motion synthesis, JeHee Lee (Advisor)
30. YongJoon Kim (김용준), CS, Seoul National Univ., Dec., 2011
  - Geometric Computing, MyungSoo Kim (Advisor)
31. HongYoon Kim (김홍윤), EE, KAIST, Nov., 2011
  - A Mobile Stream Processor with Reconfigurable SIMT Multi-Core for Ray Tracing, YiSeop Kim (Advisor)
32. YoungHo Seol (설영호), CT, KAIST, Nov., 2011

- JunYong Noh (Advisor)
- 33. JaeWoo Seo (서재우), CT, KAIST, Oct., 2011
  - JunYong Noh (Advisor)
- 34. NaeJin Kong (공내진), CS, KAIST, Aug., 2011
  - Physically-based reflection separation using polarized images, SungYong Shin (Advisor)
- 35. MinJung Lee (이민정), CS, KAIST, Dec., 2010
  - Forensic tracking watermarking for digital cinema, HyeungKyu Lee (Advisor)
- 36. JungChon Ju (주정춘), CS, KAIST, Dec., 2010
  - Improved Steganographic Method Preserving the Pixel-Value Differencing Histogram for the Security and Practicality, HyeungKyu Lee (Advisor)
- 37. Nahyup Kang (강나협), CS, KAIST, May, 2010
  - A Hybrid Approach to Multiple Fluid Simulation using Volume Fractions, Sung Yong Shin (Advisor)
- 38. HyunWoo Jeong (정현우), CS, KAIST, Oct., 2009
  - Design and Analysis of LP-based Approximation Algorithms for Facility Location Problems, Kyung-Yong Chwa (Advisor)
- 39. DongHyuk Lim, CS, KAIST, Apr., 2009
  - Data Hiding Techniques for Digital Maps, Heung-Kyu Lee (Advisor)
- 40. KyuSik Jeong, EE, KAIST, Jan., 2009
  - Bandwidth-Efficient Mobile Geometry Processor with Tessellation Functionality and Power-Saving Techniques, YiSeop Kim (Advisor)

#### **Committees in Dept. or Univ. levels**

1. Supporting committee for startups, KAIST, 3/19~3/21
2. Academic affairs committee (chair), School of Computing, 1/19~Present
3. Graduate student admission committee (chair), School of Computing, 8/18 ~ Present
4. Student committee (chair), School of Computing, 3/15 ~ 6/17
5. Graduate student admission committee (chair), 11/13 ~ 2/15  
 We have made two major changes:
  - 1) Introduce a programming test for CS-oriented students
  - 2) Create a new admission category for non-CS oriented students
 I have made and implemented these changes with Prof. SeungRyoul Maeung, KeeEung Kim, GeeHyuk Lee, U Kang, and Insik Shin
6. Public relation committee, 07/13 ~ 2/15  
 I supported our dept. to have an update-to-dated homepage. Fortunately, our dept. homepage positioned the top rank among IT-related depts.. at KAIST
7. Student committee, 01/10 ~ 02/13
8. Search committee for Dept. Chair, Sep. ~ Dec. 2011
9. Research infrastructure committee, 07/09 ~ 12/11
10. International collaboration committee, 03/08 ~ 12/09

#### **Visitors to My Lab.**

'18 ~ 14: Duksu Kim (김덕수), KOREATEC, 3/18; ChangMin Choi (최창민), Listly, 3/18; Minsuk Lee (이민석), Kookmin Univ 3/18, Namsun Sohn (손남선), KRISO, 5/17; MinSoo Cho (조민수), POSTECH, 2/17, TaeSoon Kwon (권태수), HangYang Univ., 6/16; Pierre-Yves Laffont, ETH Zürich, 4/16; YongSoo Sohn (손영수), NHN Next, 11/15; Jia Pan, City University of Hong Kong, 11/15; Jyh-Ming Lien, George Mason Univ, 10/15; David Kasik, Boeing, 9/15; DongJun Shin

(신동준), 09/15, KunJin Yoon (윤국진), GIST, 08/15, Myung Hyun (명현), KAIST, 08/15; YongJun Kim, Technion, 07/15; MyungGeol Choi (최명걸), Catholic Univ., 05/15; Frank Park (박종우), SNU, 04/15; WoonTak Wo (우운택), CT/KAIST, 01/15, John Keyser, Texas A&M Univ., 10/14; JongChang Kim (김종찬), Kokmin Univ, 07/14; WonJong Lee (이원종), SAIT, 02/14; Byungseok Shin (신병석), Inha Univ., 02/14; Zhe Lin, Adobe, 01/14

`13 ~ `11: WooChang Park (박우찬), SeJong Univ., 12/13; Peng Du, Zhejiang Univ., 08/13; TaeSoon Kwon (권태수), Hanyang Univ., 07/13; SungHyun Cho (조성현), Adobe, 07/13; Giltae Song (송길태), Stanford Univ., 06/13; Miguel Otaduy, URJC Madrid, 04/13; Sungkil Lee (이성길), SungKyunKwan Univ., 4/13; Won-Ki Jeong (정원기), UNIST, 4/13; KyungMu Lee (이경무), SNU, 03/13; Bazin Jean-Charles, ETH Zurich, 11/12, JinWook Seo (서진욱), SNU, 10/12, JungHyun Han (한정현), Korea Univ., 5/12; Pierre-Yves Laffont, INRIA Sophia-Antipolis, 02/12; Sunghee Lee (이성희), GIST, 6/11;

`10 ~ `08: Rui Wang, UMass Amherst, 12/10; Toshiya Hachisuka, UCSD, 9/10, Jung-Mo Hong, DongGuk Univ, 09/10; Eon-Il Jang (장언일), Zerodin Games, 05/10; Ted Kim, University of Saskatchewan, Canada, 12/09; Steve Marschner, Cornell Univ., 10/09, Kyeong-Seok Ko (고형석), SNU, 09/09; Bongsoo Sohn (손봉수), ChungAng Univ., 06/09; JinWook Kim (김진욱), KIST, 01/09; JuHang Lee (이주행), ETRI, 11/08; Nelson Max, UC-Davis, 09/08, Dinesh Manocha, UNC-Chapel Hill, 09/08, SangIl Park (박상일), Sejong Univ., 04/08, JeHee Lee (이제희), SNU, 03/08

### Certificates

Machine Learning by Stanford University on Coursera. Certificate earned on July 14, 2016