

# Chonhyon Park

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Department of Computer Science  
University of North Carolina at Chapel Hill  
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## RESEARCH INTERESTS / SKILLS

Motion Planning

Computer Vision

Computer Graphics

GPGPU Computing

Geometric Modeling and Processing

Languages : C++, CUDA, OpenCL, Java, Python, Matlab

## EDUCATION

**University of North Carolina at Chapel Hill, Chapel Hill, NC, USA**

Ph.D., Computer Science, Aug.2011- Aug.2016

Advisor: Professor Dinesh Manocha

**Seoul National University, Seoul, Korea**

M.S., Computer Science and Engineering, GPA: 4.1/4.3 (major 4.1/4.3) Mar.2005 - Feb.2007

Advisor: Professor Myung-Soo Kim

**Seoul National University, Seoul, Korea**

B.S., Computer Science and Engineering, GPA: 3.72/4.3 (major 3.81/4.3) Mar.2001 - Feb.2005

## PROFESSIONAL EXPERIENCE

**University of North Carolina at Chapel Hill, Chapel Hill, NC, USA**

**Research Assistant**, GAMMA Group, Jan.2012-Aug.2016.

Doing research in the area of optimization-based motion planning in dynamic and uncertain environments. The research involves the use of general purpose programming on the GPU(GPGPU) to improve the planning quality and performance.

**Disney Research Los Angeles, Glendale, CA, USA**

**Lab Associate (Intern)**, May.2015-Aug.2015.

Worked on research in the robot navigation. Developed a learning-based robot motion planning algorithm for the safe navigation in crowds.

**Samsung Research America**, San Jose, CA, USA

**Research Intern**, May.2013-Aug.2013.

Worked on research in GPU-accelerated physics computation. Developed a real-time physics simulation engine that detects collisions and computes responses.

**Honda Research Institute USA**, Mountain View, CA, USA

**Research Intern**, May.2012-Aug.2012.

Worked on research in GPU-accelerated computer vision system. Developed a machine learning-based pedestrian detection system for vehicles.

**Nexon Corporation**, Seoul, Korea

**Research Engineer**, Jan.2009-Jul.2011.

Worked on research in the areas of Computer graphics and Algorithms for games. Launched a MMORPG video game "Kavatina Story" in Jul.2009. Since then moved to a new project team and researched in Global illumination and other real-time graphics techniques.

**LG Electronics Inc.**, Seoul, Korea

**Research Engineer**, Digital TV Research Laboratory, Jan.2007-Jan.2009.

Researched and developed acceleration data structure algorithms for Digital TV middleware(DVR, etc.).

**Seoul National University**, Seoul, Korea

**Research Assistant**, 3D Modeling and Processing Lab, Mar.2005-Feb.2007.

Researched in the areas of Computational geometry and Computer aided education. Developed an online mathematics lecturing software to serve as a teaching aid in distance learning.

## PUBLICATIONS

"Parallel Motion Planning using Poisson-Disk Sampling",

**Chonhyon Park**, Jia Pan, Dinesh Manocha,

IEEE Transactions on Robotics (T-RO), in press.

"Fast and Bounded Probabilistic Collision Detection for High-DOF Robots in Dynamic Environments",

**Chonhyon Park**, Jae Sung Park, Dinesh Manocha,

The 12th International Workshop on the Algorithmic Foundations of Robotics (WAFR) 2016, San Francisco, CA, Dec 18-20, 2016 (to appear).

"HI Robot: Human Intention-aware Robot Planning for Safe and Efficient Navigation in Crowds",

**Chonhyon Park**, Jan Ondrej, Max Gilbert, Kyle Freeman, Carol O'Sullivan,

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2016, Daejeon, Korea, Oct 9-14, 2016.

"DoraPicker: An Autonomous Picking System for General Objects",

Hao Zhang, Pinxin Long, Dandan Zhou, Zhongfeng Qian, Zheng Wang, Weiwei Wan, Dinesh Manocha,

**Chonhyon Park**, Tommy Hu, Chao Cao, Yibo Chen, Marco Chow, Jia Pan,

IEEE 12th Conference on Automation Science and Engineering (CASE) 2016, Fort Worth, TX, Aug 21-24, 2016.

"Robot Motion Planning for Pouring Liquids",

Zherong Pan, **Chonhyon Park**, Dinesh Manocha,

International Conference on Automated Planning and Scheduling (ICAPS) 2016, London, UK, Jun 12-17, 2016.

"Dynamically Balanced and Plausible Trajectory Planning for Human-Like Characters",  
**Chonhyon Park**, Jae Sung Park, Steve Tonneau, Nicolas Mansard, Franck Multon, Julien Pettre, Dinesh Manocha,  
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (I3D) 2016, Redmond, WA, Feb 27-28, 2016.

"Simulating High-DOF Human-like Agents using Hierarchical Feedback Planner",  
**Chonhyon Park**, Sahil Narang, Andrew P. Best, Dinesh Manocha  
The ACM Symposium on Virtual Reality Software and Technology (VRST) 2015, Beijing, China, Nov 13-15, 2015.

"Cartesian Path Planning in Dynamic Environments using Trajectory Optimization",  
**Chonhyon Park**, Fabian Rabe, Shashank Sharma, Christian Scheurer, Uwe E. Zimmermann, Dinesh Manocha,  
IEEE International Conference on Humanoid Robots (HUMANOIDS) 2015, Seoul, Korea, Nov 3-5, 2015.

"A Reachability-based Planner for Sequences of Acyclic Contacts in Cluttered Environments",  
Steve Tonneau, Nicolas Mansard, **Chonhyon Park**, Dinesh Manocha, Franck Multon, Julien Pettre,  
The International Symposium on Robotics Research (ISRR) 2015, Sestri Levante, Italy, Sep 12-15, 2015.

"Fast and Dynamically Stable Optimization-based Planning for High-DOF Human-like Robots",  
**Chonhyon Park**, Dinesh Manocha,  
IEEE International Conference on Humanoid Robots (HUMANOIDS) 2014, Madrid, Spain, Nov 18-20, 2014.

"Smooth and Dynamically Stable Navigation of Multiple Human-Like Robots",  
**Chonhyon Park**, Dinesh Manocha ,  
The Eleventh International Workshop on the Algorithmic Foundations of Robotics (WAFR) 2014, Istanbul, Turkey, Aug 3-5, 2014.

"High-DOF Robots in Dynamic Environments using Incremental Trajectory Optimization",  
**Chonhyon Park**, Jia Pan, Dinesh Manocha,  
International Journal of Humanoid Robotics (IJHR), Vol. 11, No. 02, 1441001, 2014.

"Poisson-RRT",  
**Chonhyon Park**, Jia Pan, Dinesh Manocha,  
IEEE International Conference on Robotics and Automation (ICRA) 2014, Hongkong, China, May 31- June 7, 2014.

"Real-time Optimization-based Planning in Dynamic Environments using GPUs",  
**Chonhyon Park**, Jia Pan, Dinesh Manocha,  
IEEE International Conference on Robotics and Automation (ICRA) 2013, Karlsruhe, Germany, May 6-10, 2013.

"ITOMP: Incremental Trajectory Optimization for Real-time Replanning in Dynamic Environments",  
**Chonhyon Park**, Jia Pan, Dinesh Manocha,  
International Conference on Automated Planning and Scheduling (ICAPS) 2012, Atibaia, Sao Paulo Brazil, June 25-29, 2012.

"A Hybrid Parallel Solver for Systems of Multivariate Polynomials using CPUs and GPUs",  
**Cheon-Hyeon Park**, Gershon Elber, Ku-Jin Kim, Gye-young Kim, Joon-Kyung Seong,  
Computer-Aided Design, Vol. 43, No. 11, 1360-1369, 2011.

"CSEE:Communication System for Electronic Education",  
**Cheon-Hyun Park**, Chong-Youn Choi, Tae-Kyun Kim, Young-Taek Oh, Myung-Soo Kim,  
Distance Learning and the Internet Conference 2007, Bangkok, Thailand, December 12-15, 2007.

## AWARDS AND SCHOLARSHIP

GD/SPM Best Paper Award, Second Prize, Oct.2011

Lecture and research support scholarships for 2 semesters, Mar.2006-Feb.2007.

Merit-based scholarships for 2 semesters, Mar.2005-Feb.2006.

Computer Science Exhibition, First Prize,  
School of Computer Science and Engineering, Seoul National University, Aug 2004.

Merit-based scholarships for 5 semesters, Sep.2002-Feb.2005.

## REFERENCES

### **Dinesh Manocha**

Professor, University of North Carolina at Chapel Hill  
dm@cs.unc.edu

### **Ming C. Lin**

Professor, University of North Carolina at Chapel Hill  
lin@cs.unc.edu

### **Carol O'Sullivan**

Professor, Trinity College Dublin  
carol.osullivan@scss.tcd.ie

### **Joon-Kyung Seong**

Professor, Korea University  
jkseong@korea.ac.kr

### **Myung-Soo Kim**

Professor, Seoul National University  
mskim@snu.ac.kr