Sehoon Ha

CONTACT INFORMATION

Assistant Professor
School of Interactive Computing
Georgia Institute of Technology

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RESEARCH INTERESTS

Computer Graphics (Physics-based Animation, Fabrication),
Robotics (Deep Reinforcement Learning, Design Optimization, Optimal Control).

EDUCATION

Georgia Institute of Technology Atlanta, Georgia

Ph.D. in Computer Science, Aug, 2015

- Thesis: *Developing agile motor skills on virtual and real humanoids*
- Advisor: Dr. C. Karen Liu
- Area of Study: Computer Graphics

Korea Advanced Institute of Science and Technology Daejon, South Korea

B.S. in Computer Science, Aug. 2009

- *Summa Cum Laude*, GPA: 4.0/4.3

EMPLOYMENT HISTORY

Georgia Institute of Technology Jan. 2020 – present
Assistant Professor

Google Brain Aug. 2018 – Dec. 2019
Research Scientist

Carnegie Mellon University Dec. 2017 – Jul. 2018
Postdoctoral Fellow. Advisor: Jessica K. Hodgins

Disney Research Pittsburgh Sep. 2015 –Nov. 2017
Associate Research Scientist. Advisor: Katsu Yamane

Disney Research Pittsburgh May. 2014 – Aug. 2014
Research Intern. Advisor: Katsu Yamane

Adobe Creative Technology Lab May. 2012 – Aug. 2012
Research Intern. Advisors: J. McCann and J. Popović

Georgia Institute of Technology, College of Computing Aug. 2010 – Aug. 2015
Graduate Research Assistant. Advisor: C. Karen Liu

Referred Journal Publications

[J9] Maks Sorokin, Wenhao Yu, **Sehoon Ha**, C. Karen Liu, *Learning Human Search Behavior from Egocentric Visual Inputs*, In *Computer Graphics Forum 2021*

[J8] Wenhao Yu, Jie Tan, Yunfei Bai, Erwin Coumans, **Sehoon Ha**, *Learning Fast Adaptation with Meta Strategy Optimization*, In *IEEE Robotics and Automation Letters (RA-L) 2020*

[J7] S. Ha, S. Coros, A. Alspach, J. Bern, J. Kim, K. Yamane, *Computational Design of Robotic Devices from High-Level Motion Specifications*, In *IEEE Transactions on Robotics (IF: 4.036), 2018*

[J6] S. Ha, S. Coros, A. Alspach, J. Kim, and K. Yamane, *Computational Co-Optimization of Design Parameters and Motion Trajectories for Robotic Systems*, In *International Journal of Robotics Research (IF: 5.301), 2019* **(Accepted, 30% extension of [C6])**

[J5] J. Lee, M. X. Grey, **S. Ha**, T. Kunz, S. Jain, Y. Ye, S. S. Srinivasa, M. Stilman, and C. K. Liu, *DART: Dynamic animation and robotics toolkit* , In *The Journal of Open Source Software (JOSS), 2018*

[J4] Y.S. Song, **S. Ha**, H. Hsu, L.H. Ting, and C. K. Liu, *Stair Negotiation Made Easier Using Novel Interactive Energy-Recycling Assistive Stairs (IF: 2.806)*, In *PLoS One*, 2017

[J3] S. Ha and C. K. Liu, *Iterative Training Of Dynamic Skills Inspired By Human Coaching Techniques*, In *ACM Transactions on Graphics (IF: 4.088)*, 2014

[J2] S. Ha, J. McCann, C. K. Liu, and J. Popović, *Physics Storyboards*, In *Computer Graphics Forum (Proceedings of Eurographics, IF:1.611)*, 2013

[J1] S. Ha, Y. Ye, and C. K. Liu, *Falling and Landing Motion Control for Character Animation*, In *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia, IF:4.088)*, 2012

Referred Conference Publications

[C15] Sehoon Ha, Peng Xu, Zhenyu Tan, Sergey Levine, Jie Tan, *Learning to Walk in the Real World with Minimal Human Effort*, In *Conference on Robot Learning (CoRL) 2020*

[C14] Xinlei Pan, Tingnan Zhang, Brian Ichter, Aleksandra Faust, Jie Tan, **Sehoon Ha**, *Zero-shot Imitation Learning from Demonstrations for Legged Robot Visual Navigation*, In *IEEE International Conference on Robotics and Automation (ICRA) 2020*

[C13] Visak C.V. Kumar, **Sehoon Ha**, Gergory Sawicki, C. Karen Liu, *Learning a Control Policy for Fall Prevention on an Assistive Walking Device*, In *IEEE International Conference on Robotics and Automation (ICRA) 2020*

[C12] Tuomas Haarnoja*, **Sehoon Ha***, Aurick Zhou, Jie Tan, George Tucker, Sergey Levine, *Learning to Walk via Deep Reinforcement Learning*, In *Robotics Science & Systems 2019*. *Two First Authors equally contributed.

[C11] V. C. V. Kumar, **S. Ha**, C. K. Liu, *Expanding Motor Skills through Relay Neural Networks*, In *Conference on Robot Learning (CoRL), 2018*

[C10] K. Chen, **S. Ha**, K. Yamane, *Learning Hardware Dynamics Model from Experiments for Locomotion Optimization*, In *IEEE International Conference on Intelligent Robots and Systems (IROS), 2018*

[C9] S. Ha, J. Kim, K. Yamane, *Automated Deep Reinforcement Learning Environment for Hardware of a Modular Legged Robot*, In *International Conference on Ubiquitous Robots, 2018*

[C8] V. C. V. Kumar, **S. Ha**, K. Yamane, *Improving Model-Based Balance Controllers using Reinforcement Learning and Adaptive Sampling*, In *International Conference on Robotics and Automation (ICRA), 2018*

[C7] V. C. V. Kumar, **S. Ha**, C. K. Liu, *Learning a Unified Control Policy for Safe Falling*, In *IEEE International Conference on Intelligent Robots and Systems (IROS), 2017*

[C6] S. Ha, S. Coros, A. Alspach, J. Kim, and K. Yamane, *Joint Optimization of Robot Design and Motion Parameters using the Implicit Function Theorem*, In *Proceedings of Robotics: Science and Systems (RSS), 2017* **Best Paper Finalist (Top 3)**

[C5] S. Ha, S. Coros, A. Alspach, J. Kim, and K. Yamane, *Task-based Limb Optimization for Legged Robots*, In *IEEE International Conference on Intelligent Robots and Systems (IROS), 2016*

[C4] S. Ha and C. K. Liu, *Evolutionary Optimization for Parameterized Whole-body Dynamic Motor Skills*, In *IEEE International Conference on Robotics and Automation (ICRA), 2016*

[C3] S. Ha and C. K. Liu, *Multiple Contact Planning for Minimizing Damage of Humanoid Falls*, In *IEEE International Conference on Intelligent Robots and Systems (IROS), 2015*

[C2] S. Ha and K. Yamane, *Reducing Hardware Experiments for Model Learning and Policy Optimization*, In *IEEE International Conference on Robotics and Automation (ICRA), 2015*

[C1] S. Ha, Y. Bai, and C. K. Liu, *Human Motion Reconstruction from Force Sensors*, In *ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA), 2011*

PATENTS

[P1] S. Ha, S. Coros, K. Yamane, A. Alspach, J. Kim, *Computational Design Of Robots from High-level Task Specifications*, Filing Date: 10/23/2016.

THESIS

[PHDTHESIS] S. Ha, *Developing Agile Motor Skills on Virtual and Real Humanoids*, College of Computing, Georgia Institute of Technology

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TEACHING EXPERIENCE

Instructor, CS 4801/8801 Programming Interview Preparation — Fall 2020

Instructor, CS 4496/7496 Computer Animation — Spring 2020-

Guest Lecturer, Simulation Methods for Animation and Digital Fabrication (CS15-467 at Carnegie Mellon University) — Spring 2016

Guest Lecturer, Computer Animation (CS4496/CS7496 at Georgia Tech) — Spring 2015

Grant, Awards, Fellowship and Honors

NSF NRI-2.0, *Buoyancy-assisted Collaborative Robots That are Cheap, Safe, and Never Fall Down.*, $497,023.00, PI — Oct. 2020
Nominated as a finalist in RSS Best Conference Paper Award (Top 3) **[C6]** — Jul. 2017
13th, ACM International Collegiate Programming Contest World Finals — Apr. 2006
Gold Prize, 5th Korea Collegiate Programming Olympiad — Nov. 2005
3rd, ACM International Collegiate Programming Contest Seoul Site — Nov. 2005
5th, ACM International Collegiate Programming Contest Seoul Site — Nov. 2004
4th, ACM International Collegiate Programming Contest Seoul Site — Nov. 2003
Korea Presidential Science Scholarship — Jul. 2003
Republic of Korea Army — Aug. 2006 – Jul. 2008

Professional Activities

Program Committee: SIGGRAPH 2021, AAAI 2020, SIGGRAPH Asia 2019, Motion in Games (MIG)2016
Conference Review: SIGGRAPH, SIGGRAPH Asia, Eurographics, ICRA, IROS, CoRL, AAAI
Journal Review: Transactions on Graphics, Transactions on Robotics, International Journal of Robotics Research, Robotics and Automation Letter, Transactions on Visualization and Computer Graphics, PLOS One, Science Robotics

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Media Coverage

[M6] The Clever Clumsiness of a Robot Teaching Itself to Walk, In *Wired*

[M5] New Assistive Stairs Put a Spring in Your Step, In *Smithsonian*

[M4] These stairs recycle your energy so theyre easier to climb, In *PBS News Hours*

[M3] Robots Learning Judo Techniques to Fall Down Without Exploding, In *IEEE Spectrum*

[M2] An Algorithm Helps Robots Fall Safely, In *MIT Technology Review*

[M1] How to Fall Gracefully If Youre a Robot, In *Georgia Tech News Center*

Open Source Software

[S2] PyDART, A Python Binding of Dynamic Animation and Robotics Toolkit, *http://pydart2.readthedocs.io*

[S1] DART, Dynamic Animation and Robotics Toolkit, *http://dartsim.github.io/*

Last update: Dec, 2020