Nuttapong Chentanez

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Permanent Address
38 Pungmee7 Sukhumvit 93Rd
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Research Interests

Machine Learning, Computer Vision, Artificial Intelligence, Telepresence, Virtual Reality, Augmented Reality, Computer animation, Physical-based Simulation, Medical Simulation, Scientific Computing, Numerical methods, Computational geometry

Educations

University of California, **Berkeley, CA**
Doctor of Philosophy in Computer Science, December 2010
Dissertation Title: Interactive Simulation of Surgical Needle Insertion and Steering
Committee: Prof. James O'Brien (advisor), Prof. Jonathan Shewchuk, Prof. Ken Goldberg and Prof. Sara McMains
Certificate of Management of Technology

University of California, **Berkeley, CA**
Master of Science in Computer Science, May 2007, (GPA 4.00)
Thesis title: Liquid Simulation on Lattice Based Tetrahedral Meshes

University of Michigan, **Ann Arbor, MI**
Bachelor of Science in Engineering (Electrical Engineering), May 2005
Bachelor of Science in Engineering (Computer Science), May 2005
Graduated with highest honor (Summa Cum Laude) GPA 3.98

Honors and Awards

Royal Thai Scholarship from Development and Promotion of Science and Technology Project (DPST) to study in Computer Science from 2001-2010

NVIDIA Graduate Fellowship 2007
Supporting my research in real-time physical-based simulation

University of Michigan representative to ACM programming contest, 2003 and 2004

- Third place in East Central North America region and honorable mention in the World Final in People's Republic of China in March 2004
- Forth place in East Central North America region and honorable mention in the World Final in Czech Republic in March 2003

High school Honors and Awards

Silver medal winner in International Olympiad in Informatics (IOI) 2001 in Tampere, Finland

2rd place of Grand Award in International Science and Engineering Fair (ISEF) in Detroit, US, 2000, "Visible Surface Determination algorithms for first person 3D software"

Winner, Young Scientist Competition in Computer Science 2000 "Visible Surface Determination algorithms for first person 3D software", Bangkok Thailand

Winner, Young Scientist Competition in Computer Science 1999, "3D Graphics Generator", Bangkok Thailand

Winner, National Software Contest 1999, High School Level, "Dark & Light Territory", Bangkok Thailand

Winner, National Software Contest 1998, General Category, "3D Creation", Bangkok Thailand

Positions Held

Senior Research Consultant **July 2010-Present**
NVIDIA Corporation Worldwide
Conduct research in machine learning, computer vision, physics-based computer animation, devise new algorithms, develop prototype of the algorithms

Lecturer **Nov 2011- Present**
Department of Computer Engineering, Faculty of Computer Engineering
Chulalongkorn University Bangkok, Thailand

Senior Researcher **July 2009-July 2010**
NVIDIA Corporation Zurich, Switzerland
Conduct research in physics based computer animation, devise new algorithms, develop prototype of the algorithms and create compelling demo

Graduate Student Researcher **May 2005-May 2009**
Computer Science Department, University of California Berkeley, CA
Worked with Prof. James O' Brien (advisor), Prof. Ken Goldberg, Prof. Jonathan Shewchuk
Conducted research in physically based modeling technique for computer animation and medical simulation

Technical Director Intern **June-August 2008**
Pixar Animation Studio Emeryville, CA

Developed a Maya C++ plugin for simulating thousands of deformable objects with inter-objects collisions and frictions effect at interactive rates. Improved pipeline for rendering atmospheric effects such as smoke, dust, explosion to deform /clip over terrain

Software Engineer Intern **June-August 2007**
NVIDIA Corporation Berkeley, CA
Worked in an engineering team (Gelato Team) developing the next generation film-quality GPU centric renderer. Implemented texture management, real-time depth of field, and tracked bugs in the renderer

Software Engineer Intern **June-August 2006**
NVIDIA Corporation Santa Clara, CA
Worked in the DevTech team. Developed and implemented a parallel algorithm for simulating deformable objects with collision detection/response that run in GPU. The demo was included in NVSDK10. Helped porting a game engine to DirectX 10

Student Researcher **June-December 2004**
Artificial Intelligence Lab, University of Michigan, Ann Arbor, MI
Worked with Prof. Satinder Singh Baveja and Prof. Igor Guskov
Conducted research in reinforcement learning and triangle mesh compression with wavelet transform

Student Researcher **June-August 2003**
Artificial Intelligence Lab, University of Michigan, Ann Arbor, MI
Mentored by Prof. John Laird
Develop the 3D graphic library of an open source game engine, DXFramework, based on DirectX 8, to be used by students in University of Michigan's game programming class

Professional Activities

Paper Reviewer for:
SIGGRAPH 2008, 2010-2020 SIGGRAPH Asia 2010, 2011-2018, ACM Transaction on Computer Graphics 2012-2017, Symposium of Computer Animation 2012-2018, Journal of Computing And Information Science In Engineering (JCISE) 2010, Eurographics 2010,2012, Pacific Graphics 2009, Source Code for Biology 2013, The Visual Computer Journal 2013, 2015

Program Committee for:
Symposium of Computer Animation 2011, 2013, 2015-2020

Invited Talks

ACM SIGGRAPH Motion, Interaction and Games, Keynote, South Carolina, USA, 2020
IEEE SIMPAR Plenary Talk, Brisbane, Australia, 2018
Intel Corporation, Hillsboro, Oregon, November, 2008
Stanford University, Palo Alto, California, May, 2009

Patent (United States of America)

Grant

MASS CONSERVING EULERIAN FLUID SIMULATION

Publication number: 20150095006
Date of Patent: November 26, 2019
Inventors: Nuttapong CHENTANEZ, Matthias MULLER-FISCHER

SKINNING A CLUSTER BASED SIMULATION WITH A VISUAL MESH USING INTERPOLATED ORIENTATION AND POSITION

Publication number: 20190019345
Date of Patent: September 10, 2019
Inventors: Nuttapong Chentanez, Matthias Mueller-Fischer, Miles Macklin

METHOD AND SYSTEM FOR REPRESENTING OBJECTS WITH VELOCITY-DEPENDENT PARTICLES

Publication number: 20150325028
Date of Patent: June 11, 2019
Inventors: Tae-Yong Kim, Nuttapong Chentanez, Matthias Muller-Fischer

REAL-TIME EULERIAN WATER SIMULATION USING A RESTRICTED TALL CELL GRID

Patent number: 10055875B2
Date of Patent: August 21, 2018
Inventors: Nuttapong CHENTANEZ, Matthias MÜLLER-FISCHER

STRAIN BASED DYNAMICS FOR RENDERING SPECIAL EFFECTS

Patent number: 10249083B2
Date of Patent: April 2, 2019
Inventors: Matthias Mueller-Fischer, Nuttapong Chentanez, Miles Macklin

TECHNIQUE FOR SIMULATING THE DYNAMICS OF HAIR

Patent number: 9785729
Date of Patent: October 10, 2017
Inventors: Matthias Muller-Fischer, Nuttapong Chentanez, Tae-Yong Kim

MULTIGRID PRESSURE SOLVER FOR FLUID SIMULATION

Patent number: 9087411
Date of Patent: July 21, 2015
Inventors: Nuttapong Chentanez, Matthias Müller-Fischer

METHOD OF SIMULATING CLOTHING USING LONG RANGE ATTACHMENTS

Patent number: 9070220
Date of Patent: June 30, 2015
Inventors: Tae-Yong Kim, Matthias Muller-Fischer, Nuttapong Chentanez

System, method, and computer program product for depicting a body of water utilizing a height field and particles

Patent number: 8878856
Date of Patent: November 4, 2014
Inventors: Nuttapong Chentanez, Matthias Heinz Müller-Fischer

Pending

TECHNIQUE FOR SIMULATING THE DYNAMICS OF HAIR

Publication number: 20140172380
Filed: December 14, 2012
Inventors: Matthias Muller-Fischer, Nuttapong CHENTANEZ, Tae-Yong KIM

METHOD OF SIMULATING CLOTHING USING LONG RANGE ATTACHMENTS

Publication number: 20140168214
Filed: December 19, 2012
Inventors: Tae-Yong KIM, Matthias Muller-Fischer, Nuttapong CHENTANEZ

MULTI-GRID FLUID PRESSURE SOLVER HANDLING SEPARATING SOLID BOUNDARY CONDITIONS

Publication number: 20130035918
Filed: July 30, 2012
Inventors: Nuttapong Chentanez, Matthias Müller-Fischer

Publications

Journal Articles

Nuttapong Chentanez, Matthias Müller-Fischer, Miles Macklin, Stefan Jeschke, Tae-Yong Kim
"Cloth and Skin Deformation with a Triangle Mesh Based Convolutional Neural Network"
Computer Graphics Forum 39(8), 2020

Matthias Müller-Fischer, Miles Macklin, **Nuttapong Chentanez**, Stefan Jeschke, Tae-Yong Kim
"Detailed Rigid Body Simulation with Extended Position Based Dynamics"
Computer Graphics Forum 39(8), 2020

Miles Macklin, Kenny Erleben, Matthias Müller-Fischer, **Nuttapong Chentanez**, Stefan Jeschke, Tae-Yong Kim
"Primal/Dual Descent Methods for Dynamics"
Computer Graphics Forum 39(8), 2020

Stefan Jeschke, Christian Hafner, **Nuttapong Chentanez**, Miles Macklin, Matthias Müller-Fischer, Chris Wojtan
"Making Procedural Water Waves Boundary-aware"
Computer Graphics Forum 39(8), 2020

Miles Macklin, Kenny Erleben, Matthias Müller-Fischer, **Nuttapong Chentanez**, Stefan Jeschke, Viktor Makoviychuk
"Non-Smooth Newton Methods for Deformable Multi-Body Dynamics"
ACM Transactions on Graphics (TOG), 3(1), 2019

Nuttapon Vanakittistien, Attawith Sudsang, **Nuttapong Chentanez**:
"Game-ready 3D hair model from a small set of images"
Journal of Visualization and Computer Animation 30(2) (2019)

Matthias Müller-Fischer, **Nuttapong Chentanez**, Stefan Jeschke, Miles Macklin:
"Cable Joints"
Comput. Graph. Forum 37(8): 1-10 (2018)

Stefan Jeschke, Tomás Skrivan, Matthias Müller-Fischer, **Nuttapong Chentanez**, Miles Macklin, Chris Wojtan:
"Water surface wavelets"
ACM Trans. Graph. 37(4): 94:1-94:13 (2018)

Nuttapong Chentanez, Matthias Müller, Miles Macklin:
"GPU accelerated grid-free surface tracking"
Computers & Graphics 57: 1-11 (2016)

Nuttapong Chentanez, Matthias Müller, Miles Macklin, Tae-Yong Kim:
"Fast grid-free surface tracking"
ACM Trans. Graph. 34(4): 148:1-148:11 (2015)

Matthias Müller, **Nuttapong Chentanez**, Tae-Yong Kim, Miles Macklin:
"Air meshes for robust collision handling"
ACM Trans. Graph. 34(4): 133:1-133:9 (2015)

Nuttapong Chentanez, Matthias Müller, Tae-Yong Kim:
"Coupling 3D Eulerian, Heightfield and Particle Methods for Interactive Simulation of Large Scale Liquid Phenomena"
IEEE Trans. Vis. Comput. Graph. 21(10): 1116-1128 (2015)

Miles Macklin, Matthias Müller-Fischer, **Nuttapong Chentanez,** Tae Yong Kim
"Unified Particle Physics for Real-Time Applications"
ACM Transactions on Graphics (TOG) SIGGRAPH
Vancouver, Canada, August 10-14, 2014

Matthias Müller-Fischer, **Nuttapong Chentanez,** Tae Yong Kim
"Real Time Dynamic Fracture with Volumetric Approximate Convex Decompositions"
ACM Transaction on Graphics (TOG) SIGGRAPH
Anaheim, California, July 21-15, 2013

Nuttapong Chentanez, Matthias Müller-Fischer
"Mass-Conserving Eulerian Liquid Simulation"
IEEE Transactions on Visualization and Computer Graphics, Best of SCA, 2013

Nuttapong Chentanez, Matthias Müller-Fischer
"A Multigrid Fluid Pressure Solver Handling Separating Solid Boundary Conditions" IEEE Transactions on Visualization and Computer Graphics, Best of SCA, 2012

Nuttapong Chentanez, Matthias Müller-Fischer
"Real-Time Eulerian Water Simulation Using a Restricted Tall Cell Grid"
ACM Transaction on Graphics (TOG) SIGGRAPH
Vancouver, Canada, August 7-11, 2011

Matthias Müller-Fischer, **Nuttapong Chentanez**
"Solid Simulation with Oriented Particles"
ACM Transaction on Graphics (TOG) SIGGRAPH
Vancouver, Canada, August 7-11, 2011

Nuttapong Chentanez, Ron Alterovitz, Daniel Ritchie, Jonha Cho, Kris Hauser, Ken Goldberg, James O'Brien, Jonathan Shewchuk
"Interactive Simulation of Surgical Needle Insertion and Steering"
ACM Transaction on Graphics (TOG) SIGGRAPH
New Orleans, Louisiana, August 3-7, 2009.

Bryan Klingner, Bryan Feldman, **Nuttapong Chentanez**, James O'Brien
"Fluid Animation with Dynamic Meshes"
ACM Transaction on Graphics (TOG) SIGGRAPH
Boston, Massachusetts, July 30 – August 3, 2006.

Conference Papers

Miles Macklin, Kenny Erleben, Matthias Müller-Fischer, **Nuttapong Chentanez**, Stefan Jeschke, Zach Corse
"Local Optimization for Robust Signed Distance Field Collision"
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, 2020

Lukas Prantl, **Nuttapong Chentanez**, Stefan Jeschke, Nils Thuerey
"Tranquil Clouds: Neural Networks for Learning Temporally Coherent Features in Point Clouds"
International Conference on Learning Representations (ICLR) 2020

Miles Macklin, Kier Storey, Michelle Lu, Pierre Terdiman, **Nuttapong Chentanez**, Stefan Jeschke, Matthias Müller-Fischer
"Small Steps in Physics Simulation"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation, 2019

Jacky Liang, Viktor Makoviychuk, Ankur Handa, **Nuttapong Chentanez**, Miles Macklin, Dieter Fox
"GPU-Accelerated Robotic Simulation for Distributed Reinforcement Learning"
Conference on Robot Learning (CoRL 2018: 270-282)

Nuttapong Chentanez, Matthias Müller, Miles Macklin, Viktor Makoviychuk, Stefan Jeschke

“Physics-based motion capture imitation with deep reinforcement learning”
Motion in Games 2018: 1:1-1:10

Matthias Müller, **Nuttapong Chentanez**, Miles Macklin, Stefan Jeschke
“Long range constraints for rigid body simulations”
Symposium on Computer Animation 2017: 14:1-14:10

Matthias Müller, **Nuttapong Chentanez**, Miles Macklin
“Simulating visual geometry”
MIG 2016: 31-38

Miles Macklin, Matthias Müller, **Nuttapong Chentanez**
“XPBD: position-based simulation of compliant constrained dynamics”
MIG 2016: 49-54

Matthias Müller, Jan Bender, **Nuttapong Chentanez**, Miles Macklin
“A robust method to extract the rotational part of deformations”
MIG 2016: 55-60

Nuttapon Vanakittistien, Attawith Sudsang, **Nuttapong Chentanez**
“3D hair model from small set of images”
MIG 2016: 85-90

Nuttapong Chentanez, Matthias Müller, Miles Macklin
“Real-time simulation of large elasto-plastic deformation with shape matching”
Symposium on Computer Animation 2016: 159-167

Nuttapong Chentanez, Matthias Müller, Miles Macklin, Tae-Yong Kim:
“Grid-Free Surface Tracking on the GPU”
VRIPHYS 2015: 91-100

Nuttapong Chentanez, Matthias Müller-Fischer, Tae Yong Kim
“Coupling 3D Eulerian, Height Field and Particle Methods for the Simulation of Large Scale Liquid Phenomena”
ACM SIGGRAPH / EUROGRAPHICS Symposium on Computer Animation (SCA)
Copenhagen, July 21-23, 2014

Matthias Müller-Fischer, **Nuttapong Chentanez**, Tae Yong Kim, Miles Macklin
Strain Based Dynamics
ACM SIGGRAPH / EUROGRAPHICS Symposium on Computer Animation (SCA)
Copenhagen, July 21-23, 2014

Matthias Müller-Fischer, Tae Yong Kim, **Nuttapong Chentanez**
“Fast Simulation of Inextensible Hair and Fur”
Virtual Reality Interactions and Physical Simulations (VRIPhys)
Darmstadt, Germany, 2012

Nuttapong Chentanez, Matthias Müller-Fischer
“Mass Conserving Eulerian Liquid Simulation”
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)

Lausanne, Switzerland, 2012
(Honorable mention of best paper award)

Tae-Yong Kim, **Nuttapong Chentanez**, Matthias Müller-Fischer
"Long Range Attachments - A Method to Simulate Inextensible Clothing in Computer Games"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)
Lausanne, Switzerland, 2012

Barbara Solenthaler, Peter Bucher, **Nuttapong Chentanez**, Matthias Müller, Markus.Gross
"SPH Based Shallow Water Simulation"
Virtual Reality Interactions and Physical Simulations (VRIPhys)
Lyon, France, 2011

Matthias Müller, **Nuttapong Chentanez**
"Adding Physics to Animated Characters with Oriented Particles"
Virtual Reality Interactions and Physical Simulations (VRIPhys)
Lyon, France, 2011

Nuttapong Chentanez, Matthias Müller-Fischer
"A Multigrid Fluid Pressure Solver Handling Separating Solid Boundary Conditions"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)
Vancouver, Canada, Aug 5-7, 2011 (Best score paper award)

Nuttapong Chentanez, Matthias Müller-Fischer
"Real-time Simulation of Large Body of Water with Small Scale Details"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)
Madrid, Spain, July 2-4, 2010
Matthias Müller-Fischer**, Nuttapong Chentanez**
"Wrinkle Mesh"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)
Madrid, Spain, July 2-4, 2010

Rik Jensen, Kris Hauser**, Nuttapong Chentanez**, Frank van der Stappen, and Ken Goldberg
"Surgical Retraction of Non-Uniform Deformable Layers of Tissue: 2D Robot Grasping and Path Planning"
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
St. Lois, Missouri, October 11-15 2009

Kris Hauser, Ron Alterovitz, **Nuttapong Chentanez**, Allison Okamura, Ken Goldberg
"Feedback Control for Steerable Needles in 3D Deformable Tissue Using Helical Paths" by.
Robotics Science and Systems Conference (RSS)
Seattle, Washington, June 28 - July 1 2009

Nuttapong Chentanez, Bryan Feldman, Françoi Labelle, James O'Brien, Jonathan Shewchuk
"Liquid Simulation on Lattice-Based Tetrahedral Meshes"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)
San Diego, California, August 3 - 4, 2007

Nuttapong Chentanez, Tolga Goktekin, Bryan Feldman, James O'Brien
"Simultaneous Coupling of Fluids and Deformable Bodies"
ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)
Vienna, Austria, September 2 - 4, 2006

Andrew Barto, Satinder Singh, **Nuttapong Chentanez**
"Intrinsically Motivated Learning of Hierarchical Collections of Skills"
International Conference on Developmental Learning (ICDL)
La Jolla, California, October 20 – 22, 2004

Satinder Singh, Andrew Barto, **Nuttapong Chentanez**
"Intrinsically Motivated Reinforcement Learning"
Advances in Neural Information Processing Systems 17 (NIPS)
Vancouver, Canada, December 13 – 18, 2004

Posters

Nuttapong Chentanez, Ron Alterovitz, Daniel Ritchie, Jonha Cho, Kris Hauser, Ken Goldberg, James O'Brien, Jonathan Shewchuk
"Simulation of Needle Insertion and Tissue Deformation for Modeling Prostate Brachytherapy"
American Brachytherapy Society (ABS) Annual Meeting, April 29 - May 1, 2010

SIGGRAPH Course

Andrew glassner, **Nuttapong Chentanez,** Erika Varis Doggett, Mike Yurick, Pav Grochola, Kimball D. Thurston
"Making Machine Learning Work: From Ideas to Production Tools"
SIGGRAPH 2020 Course

SIGGRAPH Technical Sketches

Nuttapong Chentanez, Tolga Goktekin, Bryan Feldman, James O'Brien
"Simultaneous Coupling of Fluids and Deformable Bodies"
ACM SIGGRAPH 2006 Technical Sketch
Boston, Massachusetts, July 30 – August 3, 2006

SIGGRAPH Animation Theaters / Real-time Live

Nuttapong Chentanez, Matthias Müller-Fischer, Miles Macklin
"Real-time simulation of solids with large viscoplastic deformation"
ACM SIGGRAPH Real time – Live!
Anaheim, California, July 24-28, 2016

Miles Macklin, **Nuttapong Chentanez**
"Balloon burst"

ACM SIGGRAPH Real time – Live!
Los Angeles, California, August 9-13, 2015

Simon Green, **Nuttapong Chentanez,** Aron Zoellner, Johnny Costello, Kevin Newkirk, Dane Johnston
“NVIDIA FlameWorks – Real Time Fire Simulation”
ACM SIGGRAPH Real time – Live!
Vancouver, Canada, August 10-14, 2014

Matthias Müller-Fischer, **Nuttapong Chentanez,** Tae Yong Kim
“Real Time Destruction”
ACM SIGGRAPH Real time – Live!
Anaheim, California, 2013

Nuttapong Chentanez, Matthias Müller-Fischer
“Raging Rapids Ride”
ACM SIGGRAPH Real time – Live!
Vancouver, Canada, August 7-11, 2011

Nuttapong Chentanez, Bryan Feldman, Françoi Labelle, James O’Brien, Jonathan Shewchuk
"Liquid Simulation on Lattice-Based Tetrahedral Meshes"
ACM SIGGRAPH Animation Theater
San Diego, California, August 5 - 9, 2007

Bryan Klingner, Bryan Feldman, **Nuttapong Chentanez**, James O’Brien
"Fluid Animation with Dynamic Meshes”
ACM SIGGRAPH Animation Theater
Boston, Massachusetts, July 30 – August 3, 2006.