

Tae-Yong Kim, Curriculum Vitae

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Education

- Ph.D, Computer Science, University of Southern California, 2002
- M.S, Computer Science, University of Southern California, 1997
- B.E, Computer Engineering, Seoul National University, 1995

Experiences

Graphics Scientist, Rhythm and Hues Studios, Feb. 2003 - current

- Frequent contributor in introducing new algorithms/technologies to the software group.
- Designed and implemented in-house cloth and hair dynamics system (“The Chronicles of Narnia”, “Golden Compass”, “The Night at the Museum”)
- Contributor in the Academy Award winning fluid dynamics system (smoothed particle hydrodynamics , numerical optimization, performance tuning for water simulation)
- Designed and implemented in-house rigid body dynamics simulator (“Alvin and the Chipmunk”)
- Developed novel methods to simulate metal crushing with cloth simulation (“Incredible Hulk”)
- Developed novel methods to reuse simulation data (“Alvin and the chipmunk”)
- Designed and developed in-house particle system (“Mummy 3”)
- Developed a novel volume data compression technique for large scale water simulation (“The Superman Returns”)
- Developed a novel technique to simulate Octopus Arms with combination of cloth simulation and volume mass spring (“The Night at The Museum 2”)
- Developed a tetrahedra based flesh volume simulator
- Developed a particle-based visco-elastic fluid solver (“The Land of the Lost”)
- Contributor in the proprietary animation system (character rigging, deformers, shape modeling, and various other features)
- Initiated and actively manages a high performance c++ math library (vector, matrix, sparse storage, direct/iterative matrix solver, automatic differentiation, geometry toolkit, eigensystems, etc.)
- Initiated and contributed tools for shape processing tools (fixing problematic shapes such as selfintersection, hole filling, remeshing, tetrahedralization, levelset conversion, etc.)

Post-doctoral researcher, University of Southern California, Sep, 2002 – Jan, 2003

- Developed a multiresolution hair animation algorithm (“Adaptive Wisp Tree”, published in SCA 2003)
- Developed a real time hair shader using nVidia Cg (presented in SIGGRAPH 2003 course)

Research Assistant, University of Southern California, 1997 - 2002

- Researched and published new algorithms for human hair modeling and rendering (“Interactive Multiresolution Hair Modeling”, SIGGRAPH 2002, “Opacity Shadow Maps”, EGRW2001, “Thin Shell Volume”, IEEE Computer Animation 2000)

SIGGRAPH Presentations

- M. Derksen, T. Y. Kim, “Animation and Simulation of Octopus Arms in the Night at the Museum 2”, 2009 SIGGRAPH Talk
- T. Y. Kim (on behalf of Jerry Tessendorf) , “Shortcut to Reality - The Art and Compromise of software development for Physics based VFX“, 2009 SIGGRAPH Panel
- T. Y. Kim and D. Horsley, “Smash It - Simulating Car Crash in Incredible Hulk”, 2008 SIGGRAPH Talk
- T. Y. Kim and E. Vendrovsky, “DrivenShape - A Data-driven approach to shape deformation”, 2008 SIGGRAPH Talk
- T. Y. Kim and L. Flores, “Avalanche Effects for the Mummy 3”, 2008 SIGGRAPH Talk
- J. Bayever, J. Gordon. G. McMillan, Y. Lakhani, J. Mancheviz, T. Y. Kim, A. Shapiro “Making Statues Move”, 2008 SIGGRAPH Talk
- T. Y. Kim (with F. Bertails and others), “Hair Simulations in Rhythm and Hues”, SIGGRAPH 2007-2008 Course on “Realistic Hair Simulation: Animation and Rendering”
- T. Y. Kim (with S. Hadap and others), “Overview of Hardware Rendering Techniques”, SIGGRAPH 2007 Course on “Photorealistic Hair Rendering and Simulation”
- T. Y. Kim (with B. Hiebert and others) , “Simulating Talking Animals”, SIGGRAPH 2006 Course on “The Chronicles of Narnia, the Lion, the Witch, and the Rhythm and Hues”
- T. Y. Kim (with N. Thalmann and others), “Accelerating Hair Rendering with Graphics Hardware”, SIGGRAPH 2003-2004 Course
- T. Y. Kim (with N. Thalmann and others), “Interactive Hair Modeling and Editing”, SIGGRAPH 2003 Course (adapted and reprinted from 2002)
- T. Y. Kim and U. Neumann, “Interactive Multiresolution Hair Modeling and Editing”, SIGGRAPH 2002 Paper

Publications

- T. Y. Kim and E. Vendrovsky, “DrivenShape - A Data-Driven Approach to Shape Deformation”, ACM Symposium on Computer Animation (SCA), 2008
- Z. Deng, U. Neumann, J.P. Lewis, T.Y. Kim, M. Bulut, and S. Narayanan, ”Expressive Facial Animation Synthesis by Learning Speech Co-Articulation and Expression Spaces,”, IEEE Transaction on Visualization and Computer Graphics (TVCG), 2007
- K. Ward, F. Bertails, T.Y. Kim, S. Marschner, M.P. Cani, M.Lin, ”A Survey on Hair Modeling: Styling, Simulation and Rendering,”, IEEE Transaction on Visualization and Computer Graphics (TVCG), 2007
- F. Bertails, T. Y. Kim, M.P. Cani, U. Neumann, “Adaptive Wisp Tree”, Symposium on Computer Animation 2003
- T-Y Kim and U. Neumann, ”Interactive Multiresolution Hair Modeling and Editing”, ACM SIGGRAPH (Transaction on Graphics), 2002.
- T-Y Kim and U. Neumann, “Opacity Shadow Maps”, Eurographics Rendering Workshop, 2001.
- T-Y Kim and U. Neumann, “A Thin Shell Volume for Modeling Human Hair”, IEEE Computer Animation, 2000.
- D. Fidaleo, J-Y. Noh, T. Kim, R. Enciso, and U. Neumann, ”Classification and Volume Morphing for Performance-Driven Facial Animation” , International Workshop on Digital and Computational Video (DCV’99), December 1999.
- R. Enciso, J. Li, D. Fidaleo, T-Y. Kim, J-Y. Noh, and U. Neumann. ” Synthesis of 3D Faces.” International Workshop on Digital and Computational Video (DCV’99), December 1999.
- I. Yoon, J. Demers, T.Y. Kim, and U. Neumann. ”Accelerating Volume Visualization by Exploiting Temporal Coherence.” IEEE Visualization97, Hot Topics, pp. 21-24, Phoenix AZ, Oct. 1997.

Other Invited Talks

- 2007, ETRI, “Starting Your Own Visual Effects Pipeline”
- 2007, KAIST Graduate School of CT, “Introduction to Visual Effects Pipeline”
- 2006, KAIST Graduate School of CT, “Making of Narnia”
- 2004, Game Tech Seminar, “Hardware Hair Rendering”
- 2004, Game Tech Seminar, “Writing Hair Simulator with Mass Spring”
- 2004, KAIST Computer Science Department, “Introduction to VFX”

Film Credits

- The Night at the Museum 2: Battle of the Smithsonian, as *Software and Technology*
- The Mummy: Tomb of the Dragon Emperor, as *Graphics Scientist*
- The Incredible Hulk, as *Graphics Scientist*
- The Night at the Museum, as *Graphics Scientist*
- The Chronicles of Narnia - the Lion, the Witch and the Wardrobe, as *Dynamics and Simulation*

Other Involved Films

- 2009, Fast and Furious 4, Land of the Lost, Aliens in the Attic
- 2008, The Incredible Hulk, Mummy 3
- 2007, The Alvin and the Chipmunks, Golden Compass, Evan Almighty
- 2006, Night At The Museum, Happy Feet, Charlotte’s Web, Garfield 2, Superman Returns, Fast and the Furious 3
- 2005, The Chronicles of Narnia, Elektra, Ring 2
- 2004, Scooby Two, Around the World in 80 Days, Garfield, The Chronicles of Riddick.
- 2003, Elf, The Cat in the Hat, X-Men2

Summer Interns and Coworkers Advised

- 2009, Petros Falloutsos, Professor, UCLA on Dynamics Coupling
- 2006, Shen Dong, Ph.D. Student, UIUC, on Remeshing
- 2005, Shuo-Heng Chung, Ph.D. Student, UIUC, on Tetrahedralization
- 2004, Nico Gallopo, Ph.D. Student, UNC, on Dynamics Simulation on GPU

Community Services

- SIGGRAPH Paper Reviewer for 10+ Years
- ACM SCA Symposium Paper Committee Member