

# MICHAEL A. LENTINE

<http://physbam.stanford.edu/~mlentine/>

mike.lentine@gmail.com

## SUMMARY

---

Ph.D. student in computer graphics, numerical analysis, and physical simulation

Work experience in computer science and engineering at high technology companies

## AWARDS

---

Intel Graduate Fellowship	2009, 2010
Phi Kappa Phi	Spring 2007
Phi Beta Kappa	Fall 2006
Debusmann Endowed Scholarship	2006
Dean's List six semesters	2003 - 2006

## EDUCATION

---

<b>Stanford University, Stanford, CA</b> <i>Ph.D. Candidate in Computer Science</i>	<b>GPA 4.00/4.00</b> <i>June 2012 (expected)</i>
<b>Carnegie Mellon University, Pittsburgh, PA</b> <i>Bachelor of Science in Computer Science</i> <i>Minor in Political Science</i>	<b>QPA 3.97/4.00</b> <i>December 2006</i>
<b>Holmdel High School, Holmdel, NJ</b>	<b>GPA 4.40/4.00</b> <i>June 2003</i>

## TEACHING

---

<b>Course Speaker</b> , <i>SIGGRAPH 2011</i> , PhysBAM: Physically Based Simulation	<i>Summer 2011</i>
<b>Teaching Assistant</b> , <i>Stanford University</i> , Math and Computer Science Behind Special Effects	<i>Spring 2011</i>
<b>Teaching Assistant</b> , <i>Stanford University</i> , Mathematical Methods for Computer Vision, Robotics, and Graphics	<i>Fall 2008</i>

## WORK EXPERIENCE

---

<b>R&amp;D Engineer</b> , <i>Industrial Light &amp; Magic, San Francisco, CA, 94129</i>	<i>May 2008 - Present</i>
<ul style="list-style-type: none"><li>• Designed and developed a new simulation system for large scale rigid scenes used in <i>Super 8</i></li><li>• Wrote and presented a technical talk on a new deforming rigid body system used in <i>Avatar</i></li><li>• Designed and developed new simulation techniques for rigid and deformable bodies</li><li>• Debugged and corrected problems with core physical simulation software</li><li>• Designed and wrote test cases to test various features of simulation</li></ul>	
<b>Research Assistant</b> , <i>Stanford University, Stanford, CA, 94305</i>	<i>October 2007 - Present</i>
<ul style="list-style-type: none"><li>• Developed techniques to improve the speed and stability of rigid simulations which also allows for the simulation of rigid thin shells</li><li>• Developed methods to improve the stability of compressible flow simulations by adaptively changing the time step size</li><li>• Developed unconditionally stable techniques that can improve the quality of fluid simulations by conserving mass, momentum and energy</li><li>• Developed techniques to make fluid flow incompressible using only a fraction of the time of previous techniques</li><li>• Developed algorithms to control a user specified creature in order to achieve an objective such as minimizing energy or minimizing drag in a complicated fluid environment</li><li>• Developed techniques to improve the visual fidelity of hair simulation by simulating orders of magnitude more strands of hair than previous techniques</li></ul>	

- Developed parallel algorithms for fluids and solids to take advantage of large numbers of processors

**PNG Intern**, *Pixar Animation Studios, Emeryville, CA, 94608*

*January 2007 - July 2007*

- Improved performance and robustness of internal software in Perl, Python, and C/C++
- Designed and developed numerous web interfaces for bug management and tracking using Perl, Python, CGI, HTML, and JavaScript
- Designed and developed performance analysis tools using Python and C/C++

**Research Assistant**, *Carnegie Mellon University, Pittsburgh, PA, 15213*

*September 2005 - January 2007*

- Developed algorithms using principal component analysis and nearest neighbors to reconstruct skin deformations that uses a large marker database and a small marker capture
- Developed algorithms using a small marker set to add additional realism to existing animations
- Performed experiments to determine a variety of information including the link between speed and size and intelligence, the amount human motion is altered by surrounding human motion, and the extent to which humans will fill in missing motion data with realistic motion data

**AIX Quality Intern**, *IBM Corp, Austin, TX, 78758*

*May 2005 - August 2005*

- Wrote C functional verification tests for IBM AIX quality improvement software
- Wrote Perl and Shell scripts to automate functional verification testing
- Designed and wrote scripts and a Java GUI application to allow AIX testers to determine how well their test cases function

**Summer Intern**, *Internet Photonics Inc./Common Agenda/Ciena Corp, Shrewsbury, NJ, 07702* *May 2004 - August 2004, June 2003 - August 2003, and June 2002 - August 2002*

- Designed and wrote a web interface using CGI, JavaScript, and HTML for executing automated software tests for telecommunications equipment
- Wrote Perl and TCL scripts to automate software testing for telecommunications equipment
- Wrote Java applications to automate HTML form testing for telecommunications equipment
- Wrote program in Labview to control instruments that measured Gigabit Ethernet packet errors
- Helped install fiber-optic telecommunications equipment at customer sites
- Assembled and tested optical filters and amplifiers for fiber-optic telecommunications products

## PUBLICATIONS

---

Lentine, M., Aanjaneya M. and Fedkiw, R., **Mass and Momentum Conservation for Fluid Simulation**, *ACM SIGGRAPH/Eurographics Symposium on Computer Animation (SCA)* (2011).

Lentine, M., Gretarsson, J. and Fedkiw, R., **An Unconditionally Stable Fully Conservative Semi-Lagrangian Method**, *Journal of Computational Physics* 230, 2857-2879 (2011).

Lentine, M., Zheng W. and Fedkiw, R., **A Novel Algorithm for Incompressible Flow Using Only a Coarse Grid Projection**, *SIGGRAPH 2010, ACM Transactions on Graphics* 29, 4 (2010).

Criswell, B., Lentine, M. and Sauers S. **Avatar : Bending Rigid Bodies**, *SIGGRAPH 2010 Talks*.

Lentine, M., Gretarsson, J., Schroeder, C., Robinson-Mosher, A. and Fedkiw, R., **Creature Control in a Fluid Environment**, *IEEE Transactions on Visualization and Computer Graphics* 17, 682-693 (2011).

Selle, A., Lentine, M. and Fedkiw, R., **A Mass Spring Model for Hair Simulation**, *SIGGRAPH 2008, ACM Transactions on Graphics* 27, 64.1-64.11 (2008).

## SKILLS

---

**Programming:** C, C++, Python, ML, Perl, TCL/Expect, Shell scripting, Java, Objective-C, Fortran, Pascal, BASIC, Lisp, MEL, Matlab, Labview, HTML, JavaScript

**Operating Systems:** Windows/DOS, Unix/Linux, Macintosh OS

**Applications:** Maya, Microsoft Visual Studio, Microsoft Office, Vi, L<sup>A</sup>T<sub>E</sub>X, Adobe Photoshop, Macromedia Flash, etc.