# Adam M. Smith

**Postdoctoral Researcher**
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## Education

### University of California, Santa Cruz

Ph.D. in Computer Science, December 2012, Advisor: Michael Mateas
Thesis: *Mechanizing Exploratory Game Design*

B.S. in Computer Science with Honors, June 2005
(transfer from De Anza College in 2003)

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## Research Interests

### Artificial Intelligence for Design.

Knowledge Representation & Reasoning, Combinatorial Search & Optimization, Machine Learning, and Declarative Programming Languages. Design Research, Computational Creativity, Digital Games, and Game-based Education.

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## Experience

*2012-present.*   Postdoctoral Researcher, **Univ. of Washington, Center for Game Science**.

Expanded the theory and practice of AI-based game design automation, prototyped and deployed adaptive level progression systems for educational games, mentored graduate students, and started getting back into machine learning.

*Summer 2011.*   Visiting Researcher, **Univ. of Washington, Center for Game Science**.

Developed AI-based game design tools for an ongoing widely deployed educational game project.

*Summer 2011.*   Instructor, **Stanford AHPCRC Summer Institute**.

Taught computer/electrical/mechanical engineering undergraduate (including some new to programming) to program Android tablet applications in Java for scientific computing projects.

*2009-2012.*   Mobile Application Designer-Developer, **Independent**.

Created visual and sonic art software toys for the Android mobile ecosystem reaching an audience in the tens of millions, directly inspiring software developers and electronic musicians around the world.

*Summer 2008.*   Software Engineering Intern, **Google, Inc**.

Developed comment-aware parsers and company-wide symbol table as part of the Build Tools team in Kirkland, WA.

*Summer 2007.*   Software Engineering Intern, **Google, Inc**.

Developed open-source connectors between the Google Search Appliance and Hosted Apps products for the Enterprise Engineering team in Mountain View, CA.

*Summer 2006.*   Staff Research Assistant, **Los Alamos National Laboratory**.

Developed distributed image compositor for volume rendering in scientific visualization with a High-Performance Computing team.

*2006-2012.* Research Assistant, **UCSC, Expressive Intelligence Studio**.

Collaborated on interactive generative art installations, slacked off and did statistical machine learning research instead for a while, then got focused again and mechanized exploratory game design.

*2005-2011.* Teaching Assistant, **UCSC, Department of Computer Science**.

Developed a deep personal attachment to the art of teaching; influenced the development of UCSC's game design program.

*Summer 2005.* Educational Associate, **NASA Ames Research Center**.

Evaluated and integrated indoor motion tracking systems for use in a human-robot collaboration demo featuring JPL's K-9 and JSC's Robonaut.

*Spring 2005.* Undergraduate Research Assistant, **UCSC Computer Vision Lab**.

Developed interactive visualizer and denoising filters for a Canesta depth-camera.

*Summer 2004.* Consultant. **Terracom Communications, SARL**.

Developed web internal and external applications, maintained country-wide web acceleration proxy, created indexed streaming media library, trained staff in network security (while living in Kigali, Rwanda).

## Awards & Honors

Best Program Committee Member, Artificial Intelligence in Interactive Digital Entertainment (AIIDE), 2012.

Outstanding Teaching Award, UCSC Graduate Division, 2006. (top 1%)

Excellence in Teaching Award, Baskin School of Engineering, 2006.

Honors in Computer Science (with Bachelors degree), 2005.

## Publications

### Journals

**Adam M. Smith**, Michael Mateas. *Answer Set Programming for Procedural Content Generation: A Design Space Approach*. IEEE Transactions on Computational Intelligence and AI in Games, 2011.

### Conferences

Eric Butler, **Adam M. Smith**, Zoran Popović. *A Mixed-Initiative Tool for Designing Level Progressions in Games*. In Proceedings of the ACM Symposium on User Interface Software and Technology (UIST), 2013.

**Adam M. Smith**, Eric Butler, Zoran Popović. *Quantifying over Play: Constraining Undesirable Solutions in Puzzle Design*. In Proceedings of the 8th International Conference on the Foundations of Digital Games (FDG), 2013.

**Adam M. Smith**, Erik Andersen, Michael Mateas, Zoran Popović. *A Case Study of Expressively Constrainable Level Design Automation Tools for a Puzzle Game*. In Proceedings of the 7th International Conference on the Foundations of Digital Games (FDG), 2012.

**Adam M. Smith**. *Strange Loops in CFML, A Livecoder's Riddle*. In Proceedings of the International Conference on Computer Music (ICMC), 2012.

**Adam M. Smith**, Michael Mateas. *Knowledge-Level Creativity in Game Design*. In Proceedings of the Second International Conference on Computational Creativity (ICCC), 2011.

**Adam M. Smith**, Michael Mateas. *Towards Knowledge-Oriented Creativity Support in Game Design*. In Proceedings of the Second International Conference on Computational Creativity (ICCC), 2011.

**Adam M. Smith**, Mark J. Nelson, Michael Mateas. *Ludocore: A Logical Game Engine For Modeling Videogames*. In Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2010.

**Adam M. Smith**, Michael Mateas. *Variations Forever: Flexibly Generating Rulesets from a Sculptable Design Space of Mini-Games*. In Proceedings of the IEEE Conference on Computational Intelligence and Games (CIG), 2010.

Kathleen Tuite, Noah Snavely, Dun-Yu Hsiao, **Adam M. Smith**, Zoran Popović. *Reconstructing the World in 3D: Bringing Games with a Purpose Outdoors*. In Proceedings of the 5th International Conference on the Foundations of Digital Games (FDG), 2010.

**Adam M. Smith**, Mark J. Nelson, Michael Mateas. *Computational Support for Play Testing Game Sketches*. In Proceedings of the 5th Artificial Intelligence for Interactive Digital Entertainment Conference (AIIDE), 2009.

Zachary Pousman, Mario Romero, **Adam M. Smith**, Michael Mateas. *Living with Tableau Machine: A Longitudinal Investigation of a Curious Domestic Intelligence*. In Proceedings of the 10th International Conference on Ubiquitous Computing (UbiComp 08), 2008.

**Adam M. Smith**, Manfred K. Warmuth. *Learning Rotations*. In Proceedings of the 12th Annual Conference on Learning Theory (COLT), 2008.

> Although this was my first machine learning publication, it was immensely impactful. This open problem paper garnered responses in NIPS, COLT, and ICPR. Take a look at Raman Arora's "On Learning Rotations" (NIPS 2009) and its citation tree for an example of what our one-page paper started.

## Workshops & Symposia

**Adam M. Smith**. *Open Problem: Reusable Gameplay Trace Samplers*. In Proceedings of the Second Workshop on Artificial Intelligence in the Game Design Process (IDP), 2013.

Kathleen Tuite, **Adam M. Smith**. *Emergent Remix Culture in an Anonymous Collaborative Art System*. In Proceedings of the First International Workshop on Human Computation in Digital Entertainment (HCIDE), 2012.

Kate Compton, **Adam M. Smith**, Jim Whitehead. *Anza Island: Novel Gameplay Using ASP*. In Proceedings of the Third International Workshop of Procedural Content Generation in Games (PCGames), 2012.

**Adam M. Smith**, Michael Mateas. *Computational Caricatures: Probing the Game Design Process with AI*. In Proceedings of the First International Workshop on Artificial Intelligence in the Game Design Process (IDP), 2011.

**Adam M. Smith**. *Two Methods for Voxel Detail Enhancement*. In Proceedings of the Second International Workshop of Procedural Content Generation in Games (PCGames), 2011.

Sherol Chen, **Adam M. Smith**, Michael Mateas, Noah Wardrip-Fruin, Arnav Jhala. *RoleModel: Towards a Formal Model of Dramatic Roles for Story Generation*. In Proceedings of the Intelligent Narrative Technologies III Workshop (INT3), 2010.

**Adam M. Smith**, Mario Romero, Zachary Pousman, Michael Mateas. *Tableau Machine: A Creative Alien Presence*. in Proceedings of the 2008 AAAI Spring Symposium on Creative Intelligent Systems, 2008.

## Technical Reports

**Adam M. Smith**, Chris Lewis, Kenneth Hullet, Gillian Smith, Anne Sullivan. *An Inclusive Taxonomy of Player Modeling*. Technical Report UCSC-SOE-11-13, 2011.

**Adam M. Smith**, Manfred K. Warmuth. *Learning Rotations Online*. Technical Report UCSC-SOE-10-08, 2010.

**Adam M. Smith**, James Skorupski, James Davis. *Transient Rendering*. Technical Report UCSC-SOE-08-26, 2008.

> Portions of this technical report were published as Kirmani, Huchinson, Davis, and Raskar's "Looking Around The Corner Using Ultrafast Transient Imaging" (IJCV 2011).

### Demos and Posters

**Adam M. Smith**, Chris Lewis, Kenneth Hullett, Gillian Smith, Anne Sullivan. *An Inclusive View of Player Modeling*. Poster at the 6th International Conference on the Foundations of Digital Games (FDG), 2011.

**Adam M. Smith**, Michael Mateas, *Variations Forever: A Game of Exploring Game Design Spaces*, Demonstration at the Fourth International Conference on the Foundations of Digital Games (FDG), 2009.

**Adam M. Smith**, Mark J. Nelson, Michael Mateas. *Prototyping Games with BIPED*. Demonstration at the Fifth Artificial Intelligence for Interactive Digital Games Conference (AIIDE), 2009.

**Adam M. Smith**, James Skorupski, James Davis. *Understanding Video at 30 Billion Frames Per Second with Transient Rendering*. Poster at the Bay Area Vision Meetup (BAVM), 2009.

## Invited Talks

2013, **University of Bath, Department of Computer Science**.
*Research through/into/for Games and Game-based Education*.

2013, **University of Bath, Department of Computer Science**.
*Mechanizing Exploratory Game Design with Formal Design Space Models*.

2013, **Oxford University, Department of Computer Science.**
*Mechanizing Exploratory Game Design with Formal Design Space Models*.

2013, **Goldsmiths University of London, Department of Computing**.
*Mechanizing Exploratory Game Design with Formal Design Space Models*.

2011, **University of Washington, Graphics and Imaging Laboratory.**
*Building the Intelligent Game Designer: A Creative Machine*.

## Teaching Experience

### Instructorships

See *Experience* at Stanford.

### Teaching Assistantships and Equivalent Volunteering

UC Santa Cruz, 2005-2011

- Computer Literacy (CMPS 2 with Paulo Franca)
- Game Design Fundamentals (CMPS 80K with Noah Wardrip-Fruin)
- Advanced Analysis of Algorithms (CMPS 102 with Manfred Warmuth)
- Computer Graphics (CMPS 160 with James Davis)
- Scientific Visualization, Computer Animation, *and Games* (CMPS 161 with Alex Pang)
- Game Engines (CMPS 164 with Alex Pang, later Arnav Jhala)
- Game Design Studio (CMPS 172 with Michael Mateas)

### Guest Lectures

UC Santa Cruz, 2005-2012

- Game Programming with Python
- The Spectrum of Game Engine Architectures
- Designing a Framework for Simple Physics Games
- Digital Image Compositing
- Non-photorealistic Rendering
- Programmer-oriented Tools for Creativity in Graphics
- Livecoding for Music, Sculpture, and Poetry
- Overlapping Notions of Time in Programming Languages
- Answer Set Programming for Procedural Content Generation

The Evergreen State College, 2013

- Design Grammars for Creative Programmers

## Mentoring

Undergraduates at UC Santa Cruz

- Erica Woolley, BS in Computer Science: Computer Game Design, 2011.
- Vivian Wong, BS in Computer Science: Computer Game Design, 2012.

Graduate students at University of Washington

- Rahul Banerjee, PhD in Computer Science & Engineering (ongoing)
- Aaron Bauer, PhD in Computer Science & Engineering (ongoing)
- Eric Butler, PhD in Computer Science & Engineering (ongoing)

## Professional Activities

**School Service:** Graduate Admissions Reviewer, University of Washington, Department of Computer Science and Engineering, 2012 and 2013.

**Conference Organization:** Doctoral Mentoring Program Co-chair, AIIDE 2013.

**Workshop Organization:** *Artificial Intelligence in the Game Design Process* at AIIDE 2011 and AIIDE 2013.

**Senior Program Committee:** Foundations of Digital Games (FDG).

**Conference Reviewing:** AAAI Conference on Artificial Intelligence (AAAI), Foundations of Digital Games (FDG), Artificial Intelligence in Interactive Digital Entertainment (AIIDE), IEEE Conference on Computational Intelligence in Games (CIG)

**Journal Reviewing:** IEEE Transactions on Computational Intelligence and AI in Games (TCIAIG), IEEE Transactions on System, Man and Cybernetics (TSMC).

**Student Volunteering:** ACM SIGGRAPH, 2007.

## Citizenship

Unitedstatesian.