

# Pedro V. Sander



## Personal Data

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BIRTHPLACE & DATE: Niterói, Rio de Janeiro, Brazil | 23 Sep 1976  
 CITIZENSHIP: Brazil  
 RESIDENCE: Hong Kong

EMAIL: [psander@cse.ust.hk](mailto:psander@cse.ust.hk)  
 WEB PAGE: <http://www.cse.ust.hk/~psander>  
 ADDRESS: Department of Computer Science and Engineering  
 The Hong Kong University of Science and Technology  
 Clear Water Bay, Kowloon, Hong Kong

## Education

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- 1999-2003 | *Doctor of Philosophy (Ph.D.) in COMPUTER SCIENCE, Harvard University*  
Microsoft Research Graduate Fellow (2000-2002)
- 1998-1999 | *Science Master (S.M.) in COMPUTER SCIENCE, Harvard University*
- 1994-1998 | *Bachelor of Science (B.S.) in COMPUTER SCIENCE, Stony Brook University*

## Work Experience

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- 2006-CURRENT | *Assistant Professor, Department of Computer Science and Engineering*  
**The Hong Kong University of Science and Technology (HKUST)**  
Tenure-track member of the Vision and Graphics Group (VISGRAPH) and the Faculty of the Department of Computer Science and Engineering.
- 2003-2006 | *Staff Software Engineer | Senior Software Engineer*  
**ATI Research**  
Member of the Application Research Group. Research in rendering techniques using latest and upcoming graphics hardware. ATI has since been acquired by Advanced Micro Devices (AMD).
- SUMMER 2000, 2001, 2002 | *Research Intern*  
**Microsoft Research**  
Member of the Graphics Research Group of the Redmond lab. Research in geometry processing. Mentors: Dr. Hugues Hoppe and Dr. John Snyder.
- 1999-2003 | *Teaching Fellow | Research Assistant*  
**Harvard University**  
Teaching fellow for undergraduate and graduate computer graphics courses; reserch in computer graphics leading up to the dissertation.
- SUMMER 1998 | *Software Design Engineer in Test Intern*  
**Microsoft Corporation**  
Summer internship in Microsoft's DirectX team in Redmond.
- 1997-1998 | *Teaching Assistant | Research Assistant*  
**Stony Brook University**

Teaching assistant for an undergraduate computer graphics course; research in computer graphics.  
Advisor: Theo Pavlidis.

SUMMER 1997 | *Systems Professional*  
**Goldman, Sachs, and Co.**  
System design and implementation at the Manhattan office.

## University Teaching

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HKUST only

FALL 2011 | **COMP1004: Programming Fundamentals and Methodology** (ENGB section)  
**COMP5411: Advanced Computer Graphics** (1/2 load)

SPRING 2011 | **CSIT540: Computer Graphics** (3 weeks)

FALL 2010 | **COMP104: Programming Fundamentals and Methodology** (ENGB section)  
**COMP541: Advanced Computer Graphics** (1/2 load)

SPRING 2010 | **COMP341: Computer Graphics**  
**CSIT540: Computer Graphics** (3 weeks)

FALL 2009 | **COMP104: Programming Fundamentals and Methodology** (ENGB section)

SPRING 2009 | **CSIT540: Computer Graphics** (3 weeks)

FALL 2008 | **COMP104: Programming Fundamentals and Methodology**

SPRING 2008 | **COMP640M: GPU Computation**  
**CSIT540: Computer Graphics** (3 weeks)

FALL 2007 | **COMP104: Programming Fundamentals and Methodology**  
**COMP300D: Game Development** (1/2 load)

SPRING 2007 | **COMP640M: GPU Computation**

## Conference Teaching

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2008 | *Parallel Computing for Graphics: Beyond Programmable Shading*  
**ACM SIGGRAPH Asia**  
Full day course | one of many invited speakers

2006 | *GPU Shading and Rendering*  
**ACM SIGGRAPH**  
Full day course | one of many invited speakers

2005 | *Advanced Real-Time Rendering in 3D Graphics and Games*  
**ACM SIGGRAPH**  
Full day course | one of many invited speakers

## Conference Organization

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|------|---|
| 2012 | <b>Pacific Graphics</b><br><i>Papers Co-chair</i>                                   |
| 2011 | <b>ACM SIGGRAPH Asia</b><br><i>Courses Chair and Conference Committee member</i>    |
|      | <b>IEEE Pacific Visualization</b><br><i>Organization Co-chair and Finance Chair</i> |

## Other Conference and Journal Service

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| 2011 | <i>Papers Committee, ACM SIGGRAPH Asia</i><br><i>Program Committee, Pacific Graphics</i><br><i>Program Committee, EGSR</i><br><i>Papers Committee, ACM I3D</i><br><i>Program Committee, IEEE SIBGRAPI</i><br><i>Papers Committee, Shape Modeling International</i> |
| 2010 | <i>Papers Committee, ACM SIGGRAPH</i><br><i>Associate Editor, GMOD (2010-present)</i><br><i>Program Committee, EGSR</i><br><i>Papers Committee, ACM I3D</i><br><i>Program Committee, Pacific Graphics</i><br><i>Papers Committee, Shape Modeling International</i> |
| 2009 | <i>Papers Committee and Session Chair, ACM SIGGRAPH</i><br><i>Program Committee, EGSR</i><br><i>Program Committee, Pacific Graphics</i><br><i>Papers Committee, ACM I3D</i><br><i>Program Committee, ISVC</i>  |
| 2008 | <i>Program Committee, CASA</i><br><i>Program Committee, Pacific Graphics</i><br><i>Program Committee, IEEE SIBGRAPI</i><br><i>Program Committee, IEEE SMI</i><br><i>Papers Committee, ACM I3D</i>  |
| 2007 | <i>Program Committee, IEEE SIBGRAPI</i><br><i>Program Committee, Pacific Graphics</i>  |
| 2006 | <i>Program Committee, IEEE SIBGRAPI</i>  |

## University Service

HKUST only

University and SENG	<p>Shooting and processing gigapixel images of HK and the campus (2011) For the department, school and the university 20th anniversary celebration event; Also in collaboration with the Hong Kong Tourism Board for use in their site</p> <p>Gigapixel panorama workshop to gifted high school students (2011) Part of HKUST 20th anniversary celebration events; featured by the local press</p> <p>University Staff Mens Doubles tennis team (2007-2009) Represented HKUST at Hong Kong Corporate Games</p>
CSE	<p>Coordinator of Computer Science B.Sc. Program (2011-present) Manage the B.Sc. double major program for elite students and serve as advisor to all enrolled students.</p> <p>VISGRAPH video and tours (2009-present) Produced a video of the VISGRAPH research and presented it to the president as well as numerous external visitors from time to time</p> <p>Department promotional videos. Co-produced two videos for undergraduate and graduate/industry audiences.</p> <p>Programming Course for Direct Entry students (2008-present). Coordinated the programming course for direct entry students (taught by an instructional assistant).</p> <p>JUPAS interviews (2008-present). Conducted day-long JUPAS interviewing sessions for incoming students.</p> <p>Member of CSE Facilities Committee, 2009-present. Member of CSE Recruitment and Outreach committee, 2006-present. Member of CSE Final Year Project committee, 2006-2007.</p>

## Advising

HKUST students unless otherwise noted | FP = Following position employer or graduate school enrolled

PH.D.	<p>Jing Liao, 2011-present (RGC HK Ph.D. Fellowship recipient) Ge Chen, 2010-present Lei Yang, 2007-2011 (FP: Bosch Research) Hongwei Li, 2008-2010 (co-advised with Philip Fu; FP: Microsoft)</p>
M.PHIL.	<p>Kenneth Tse, 2008-2010 (FP: Mobile game developer in HK) Xuxiang Lin, 2008-2010 (FP: Credit Suisse) Liang Hu, 2006-2009 (FP: Google Shanghai)</p>
B.SC. / B.ENG.	<p>Yue Yu, 2010-2011 (FP: Stanford) Jingwan Lu, FYT 2008-2009 (FP: Princeton) Alex Yau, FYT 2007-2008 (FP: HKUST) Jiahe Xi, 2007 (on exchange from Zhejiang University; FP: Oxford)</p>

	Rui Fang, FYT 2006-2007 (co-advised with Qiong Luo)
INTERNSHIP	Diego Nehab, summer 2005 (Ph.D., Princeton)
ATI RESEARCH	Joshua Barczak, summer 2005 (M.S., Maryland)

## Student Committee Memberships

HKUST Computer Science students unless otherwise noted

PH.D. DEFENSE	Lei Yang, 2011 (advisor) Weichen Liu, 2011 Weiwei Cui, 2011 Pitchaya Sitthi-amorn, 2011 (University of Virginia, USA) Hongwei Li, 2010 (co-advisor) Wai-Kong Law, 2010 Shu Liao, 2009 Liwei Guo (ECE), 2008 Kin-Chung Au, 2007
PH.D. PROPOSAL	Lei Yang, 2011 (advisor) Tian Fang, 2011 Pitchaya Sitthi-amorn, 2010 (University of Virginia, USA) Weiwei Cui, 2011 Hongwei Li, 2010 (co-advisor) Wai-Kong Law, 2010 Shu Liao, 2009 (chairperson) Yingcai Wu, 2009 (chairperson) Mengyao Ma, 2008 Hongbo Fu, 2007 Kin-Chung Au, 2007 (chairperson)
PH.D. QUALS	Zhexi Wang, 2011 Honghui Zhang, 2010 Youyi Zheng, 2009 (chairperson) Tian Fang, 2008 Lei Yang, 2008 (advisor) Hongwei Li, 2008 (co-advisor) Liang Hu, 2008 (advisor) Ming Yuen Chan, 2008 Wai-Kong Law, 2008 (chairperson) Ka Lok Hung, 2008 (chairperson) Weiwei Cui, 2007
M.PHIL. DEFENSE	Jackson Yuen, 2011 Yuan Gao, 2011 He Liu, 2011 Chun Ki Tang, 2011 Xuxiang Lin, 2010 (advisor) Kenneth Tse, 2010 (advisor) Yi-Lun Tang, 2009 Ka-Kei Chung, 2009 Liang Hu, 2009 (advisor)

Lap-Fai Yu, 2009  
Kai-Lung Chung, 2008  
Wenqi Zhu, 2008  
Jianwei Li, 2008 (chairperson)

## Funded Grants

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RGC/GRF	RGC CERG #619509 (PI) - Framebuffer Techniques for Fast, Approximate Pixel Shading. 2009-2012. HK\$574,571.
	RGC CERG #619008 (PI) - Mesh Traversal Optimization for Efficient Geometry Processing. 2008-2011. HK\$497,084.
	RGC CERG #616808 (Co-I. PI: Dr. Qiong Luo) - Relational Query Co-Processing on Graphics Processors. 2008-2010. HK\$572,164.
	RGC CERG #619207 (PI) - Reprojection Caching: A General Framework for Improving Real-Time Rendering Efficiency. 2007-2010. HK\$558,000.
OTHER	School of Engineering SBI06/07.EG01-3 (PI) - Harnessing the power of graphics processing unit. 2007-present. HK\$351,500.
	HKUST DAG06/07.EG07 (PI) - Interactive Triangle Order Optimization. 2007-present. HK\$100,000.

## Patents

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2009	Fast Triangle reordering for vertex locality and reduced overdraw. <i>US Pat. Application 20090167758</i> - Filed Jul 02, 2009 - AMD Inc.
2007	Multi-chart geometry images. <i>US Pat. 7586488</i> - Filed Aug 22, 2007 - Microsoft Corporation.
2005	Systems and methods for providing a fine to coarse look ahead in connection with parametrization in a graphics system. <i>US Pat. 7218322</i> - Filed Jul 19, 2005 - Microsoft Corporation.
	Discontinuity edge overdraw. <i>US Pat. 7286138</i> - Filed Feb 22, 2005 - Microsoft Corporation.
2004	Systems and methods for optimizing geometric stretch of a parametrization scheme. <i>US Pat. 7262769</i> - Filed Oct 29, 2004 - Microsoft Corporation.
2002	Systems and methods for providing signal-specialized parametrization. <i>US Pat. 7071936</i> - Filed May 1, 2002 - Microsoft Corporation.

## Academic Publications

For citation data, refer to <http://scholar.google.com/scholar?q=pedro+sander>

- | JOURNAL |   |
|---------|---|
|         | Lei Yang, Kenneth Tse, <b>Pedro V. Sander</b> , Jason Lawrence, Diego Nehab, Hugues Hoppe, Clara Wilkins. <b>Image-based Bidirectional Scene Projection</b> . ACM Transactions on Graphics, Volume 30, Issue 6 (SIGGRAPH Asia 2011).                |
| 2       | Lei Yang, <b>Pedro V. Sander</b> , Jason Lawrence, Hugues Hoppe. <b>Antialiasing Recovery</b> . ACM Transactions on Graphics, Volume 30, Issue 3 (presented at SIGGRAPH 2011).  |
| 3       | Hongwei Li, Li-Yi Wei, <b>Pedro V. Sander</b> , Chi-Wing Fu. <b>Anisotropic Blue Noise Sampling</b> . ACM Transactions on Graphics, Volume 29, Issue 6 (SIGGRAPH Asia 2010).  |
| 4       | Lei Yang, Diego Nehab, <b>Pedro V. Sander</b> , Pitchaya Sitthi-amorn, Jason Lawrence, Hugues Hoppe. <b>Amortized Supersampling</b> . ACM Transactions on Graphics, Volume 28, Issue 5 (SIGGRAPH Asia 2009).  |
| 5       | Bingsheng He, Ke Yang, Rui Fang, M. Lu, Naga K. Govindaraju, Qiong Luo, and <b>Pedro V. Sander</b> . <b>Relational Query Co-Processing on Graphics Processors</b> . ACM Transactions on Database Systems (TODS), Volume 34, Issue 4, December 2009. |
| 6       | Liang Hu, <b>Pedro V. Sander</b> , Hugues Hoppe. <b>Parallel View-Dependent Level of Detail Control</b> . IEEE Transactions on Visualization and Computer Graphics, Volume 16, Issue 5.   |
| 7       | <b>Pedro V. Sander</b> , Diego Nehab, Eden Chlamtac, Hugues Hoppe. <b>Efficient Traversal of Mesh Edges using Adjacency Primitives</b> . ACM Transactions on Graphics, Volume 27, Issue 5 (SIGGRAPH Asia 2008).                                     |
| 8       | Pitchaya Sitthi-amorn, Jason Lawrence, Lei Yang, <b>Pedro V. Sander</b> , Diego Nehab, Jiahe Xi. <b>Automated Reprojection-Based Pixel Shader Optimization</b> . ACM Transactions on Graphics, Volume 27, Issue 5 (SIGGRAPH Asia 2008).             |
| 9       | Lei Yang, <b>Pedro V. Sander</b> , Jason Lawrence. <b>Geometry-Aware Framebuffer Level of Detail</b> . Eurographics Computer Graphics Forum, Volume 27, Issue 4 (Eurographics Symposium on Rendering 2008).   |
| 10      | <b>Pedro V. Sander</b> , Diego Nehab, Joshua Barczak. <b>Fast Triangle Order Optimization for Vertex Locality and Reduced Overdraw</b> . ACM Transactions on Graphics, Volume 26, Issue 3 (SIGGRAPH 2007).  |

- CONFERENCE | Jingwan Lu, **Pedro V. Sander**, Adam Finkelstein.  
**Interactive Painterly Stylization of Images, Videos and 3D Animations.**  
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games 2010. Washington, USA, February 2010, pp. 127–134.
- 2 | Liang Hu, **Pedro V. Sander**, Hugues Hoppe.  
**Parallel View-Dependent Refinement of Progressive Meshes.**  
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games 2009. Boston, USA, February 2009, pp. 169–176.
- 3 | Pitchaya Sitthi-amorn, Jason Lawrence, Lei Yang, **Pedro V. Sander**, Diego Nehab.  
**An Improved Shading Cache for Modern GPUs.**  
Proceedings of ACM SIGGRAPH Symposium on Graphics Hardware 2008. Sarajevo, Bosnia, June 2008, pp. 95–101.
- 4 | Bingsheng He, Ke Yang, Rui Fang, Mian Lu, Naga Govindaraju, Qiong Luo, Pedro Sander.  
**Relational Joins on Graphics Processors.**  
Proceedings of ACM SIGMOD 2008, Vancouver, BC, Canada, June 2008, pp. 511–524.
- 5 | Diego Nehab, **Pedro V. Sander**, Jason Lawrence, Natasha Tatarchuk, John Isidoro.  
**Accelerating Real-Time Shading with Reverse Reprojection Caching.**  
Proceedings of ACM SIGGRAPH Symposium on Graphics Hardware. San Diego, USA, July 2007, pp. 25–35.  
*(Voted second best paper in conference.)*
- 6 | Ke Yang, Bingsheng He, Rui Fang, Mian Lu, Naga Govindaraju, Qiong Luo, **Pedro V. Sander**, Jiaoying Shi.  
**In-Memory Grid Files on Graphics Processors.**  
Proceedings of Third International Workshop on Data Management on New Hardware. Beijing, China, June 2007.
- 7 | Christopher Oat, **Pedro V. Sander**.  
**Ambient Aperture Lighting.**  
Proceedings of ACM Symposium on Interactive 3D Graphics and Games. Seattle, WA, May 2007, pp. 61–64.
- 8 | Diego Nehab, Joshua Barczak, **Pedro V. Sander**.  
**Triangle Order Optimization for Graphics Hardware Computation Culling.**  
Proceedings of ACM Symposium on Interactive 3D Graphics and Games. Redwood City, USA, March, 2006, pp. 207–211.  
Selected top three in conference; invited for talk at *SIGGRAPH 2006*.
- 9 | **Pedro V. Sander**, Jason L. Mitchell.  
**Progressive Buffers: View-dependent Geometry and Texture LOD Rendering.**  
Proceedings of Eurographics/ACM SIGGRAPH Symposium on Geometry Processing. Vienna, Austria, July 2005, pp. 129–138.
- 10 | Geetika Tewari, John Snyder, **Pedro V. Sander**, Steven J. Gortler, Hugues Hoppe.

- Signal-Specialized Parametrization for Piecewise Linear Reconstruction.**  
 Proceedings of Eurographics/ACM SIGGRAPH Symposium on Geometry Processing. Nice, France, July 2004, pp. 57–66.
- 11 Hector Briceño, **Pedro V. Sander**, Leonard McMillan, Steven J. Gortler, Hugues Hoppe.  
**Geometry Videos.**  
 Proceedings of ACM Symposium on Computer Animation. San Diego, USA, July 2003, pp. 136–146.
- 12 **Pedro V. Sander**, Zoë Wood, Steven J. Gortler, John Snyder, Hugues Hoppe.  
**Multi-Chart Geometry Images.**  
 Proceedings of Eurographics/ACM SIGGRAPH Symposium on Geometry processing. Aachen, Germany, June 2003, pp. 146–155.
- 13 Danil Kirsanov, **Pedro V. Sander**, Steven J. Gortler.  
**Simple Silhouettes for Complex Surfaces.**  
 Proceedings of Eurographics/ACM SIGGRAPH Symposium on Geometry processing. Aachen, Germany, June 2003, pp. 102–106.
- 14 **Pedro V. Sander**, Steven J. Gortler, John Snyder, Hugues Hoppe.  
**Signal-Specialized Parametrization.**  
 Proceedings of Eurographics Workshop on Rendering. Pisa, Italy, June 2002, pp. 87–100.
- 15 **Pedro V. Sander**, Denis Peleshchuk, Barbara J. Grosz.  
**A Scalable, Distributed Algorithm for Efficient Task Allocation.**  
 Proceedings of First International Joint Conference on Autonomous Agents and Multi-Agent Systems. Bologna, Italy. July 2002. pp. 1191–1198.
- 16 **Pedro V. Sander**, John Snyder, Steven J. Gortler, Hugues Hoppe.  
**Texture Mapping Progressive Meshes.**  
 Proceedings of ACM SIGGRAPH 2001. Los Angeles, USA, August 2001, pp. 409–416.
- 17 **Pedro V. Sander**, Hugues Hoppe, John Snyder, Steven J. Gortler.  
**Discontinuity Edge Overdraw.**  
 Proceedings of ACM Symposium on Interactive 3D Graphics. Research Triangle Park, USA, March 2001, pp. 167–174.
- 18 **Pedro V. Sander**, Xianfeng Gu, Steven J. Gortler, Hugues Hoppe, John Snyder.  
**Silhouette Clipping.**  
 Proceedings of ACM SIGGRAPH 2000. New Orleans, USA, July 2000, pp. 409–416.
- BOOK CHAPTER **Pedro V. Sander**, Natalya Tatarchuk, Jason L. Mitchell. **Explicit Early-Z Culling for Efficient Fluid Flow Simulation.** ShaderX5: Advanced Rendering Techniques, Charles River Media, 2006.
- 2 David Gosselin, **Pedro V. Sander**, Jason L. Mitchell. **Drawing a Crowd.** ShaderX3: Advanced Rendering With DirectX And OpenGL, Charles River Media, 2004.

3	David Gosselin, <b>Pedro V. Sander</b> , Jason L. Mitchell. <b>Methods for Real-time Skin Rendering</b> . ShaderX3: Advanced Rendering With DirectX And OpenGL, Charles River Media, 2004.
REPORT	Daniel Scherzer, Lei Yang, Oliver Mattausch, Diego Nehab, <b>Pedro V. Sander</b> , Michael Wimmer, Elmar Eisemann. <b>A Survey on Temporal Coherence Methods in Real-Time Rendering</b> . State of the Art Report, Eurographics, 2011. ( <i>refereed publication with oral presentation at Eurographics</i> )
POSTER PAPER, DEMO, SKETCH	Hongwei Li, Diego Nehab, Li-Yi Wei, <b>Pedro V. Sander</b> , Chi-Wing Fu. <b>Fast capacity constrained Voronoi tessellation</b> . In <i>I3D 2010</i> posters program.
2	Rui Fang, Bingsheng He, Mian Lu, Ke Yang, Naga K. Govindaraju, Qiong Luo, <b>Pedro V. Sander</b> . <b>GPUQP: Query Co-Processing using Graphics Processors</b> . In <i>SIGMOD 2007</i> demonstration paper program.
3	Diego Nehab, <b>Pedro V. Sander</b> , John Isidoro. <b>The Real-Time Reprojection Cache</b> . In <i>SIGGRAPH 2006</i> sketches program.
4	<b>Pedro V. Sander</b> , John Isidoro. <b>Compressing and Managing Large Datasets for The Real-Time Parthenon Demo</b> . In <i>I3D 2006</i> posters program.
5	<b>Pedro V. Sander</b> , Natalya Tatarchuk, Jason L. Mitchell. <b>Early-Z Culling for Efficient Fluid Flow Simulation</b> . In <i>I3D 2005</i> posters program.
6	<b>Pedro V. Sander</b> , David Gosselin, Jason L. Mitchell. <b>Real-Time Skin Rendering in Graphics Hardware</b> . In <i>SIGGRAPH 2004</i> sketches program.

## Other Key Projects

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GIGAPIXEL IMAGES	<p><b>Urca 152GP</b> (<i>World Record for largest digital photograph, September 2010</i>)  <a href="http://www.gigapan.org/gigapans/58857/">http://www.gigapan.org/gigapans/58857/</a>  Panorama consisting of 152 billion pixels taken at the top of Sugar Loaf, Rio de Janeiro, Brazil. Taken in June and released in September of 2010. Collaboration with Rodolfo Lima, Diego Nehab, and Luiz Velho, from IMPA.</p> <p><b>Corcovado 67GP</b> (<i>World Record for largest digital photograph, July 2010</i>)  <a href="http://www.gigapan.org/gigapans/66020/">http://www.gigapan.org/gigapans/66020/</a>  Panorama consisting of 67 billion pixels taken from the statue of Christ, The Redeemer, at the top of Corcovado, Rio de Janeiro, Brazil. Taken in June and released in July of 2010. Collaboration with Rodolfo Lima, Diego Nehab, and Luiz Velho, from IMPA.</p>
TECHNICAL DEMOS	<p><b>ATI "Screen Space" Screensaver</b>  This screensaver uses fluid flow simulation and parallax occlusion mapping techniques to showcase the ATI Radeon X1900 GPU. Lead programmer; with Daniel Szecket, Eli Turner, Dan Roeger, and Abe Wiley. December 2005-January 2006.</p> <p><b>ATI "Parthenon" Real-Time Demo</b></p>

This demo consists of rendering 15 million polygons, derived from a real-world laser capture of the actual Parthenon in Athens, Greece. Image based lighting techniques and a novel LOD algorithm are used to render this dataset in real-time on the Radeon X1800 graphics processor. Project lead; with Eli Turner, John Isidoro, Joshua Barczak, and Jason L. Mitchell. October 2004-October 2005.

#### **ATI "Fluid Flow" Screensaver**

This screensaver demonstrates the use of the ATI's graphics technology as a general purpose computation platform. The complex mathematical operations required to simulate fluid flow are all computed in real-time on the GPU. Project lead. August 2004-October 2004.

#### **ATI "Ruby, the DoubleCross" Real-Time Demo**

Through the use of motion captured animation, depth-of-field, realistic image based lighting and dynamic shadows; "DoubleCross" borrows heavily from both gaming and movie genres to create a compelling demo that further raises the expectations for real-time graphics. Shader programmer; with members of ATI's 3D Application Research Group. January 2004-July 2004. Appears on *SIGGRAPH 2004 Animation Festival*.

### MISCELLANEOUS

#### **Dartboard IP**

This project involved hacking an electronic dartboard and connecting it to a PC through a parallel port. The PC relays dart hits over the internet to a graphical game interface. Designer and programmer; with Marco Carbone. September 2001-February 2002. (Appeared on Slashdot.org on February 2002, resulted in over 50,000 web page hits in one day.)

#### **PAINTRiS**

An original Tetris variant which was presented at SIGGRAPH 1997 Educator's Program. Fall 1996.

## Selected Talks

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- 2011 | Techniques for Accelerating Real-Time Rendering  
*CSIAM Geometric Design & Computing 2011* keynote  
Guangzhou, China, November, 2011
  
- 2010 | Reprojection Caching.  
*Graphics group talk*.  
University of Hong Kong, Hong Kong, November, 2010
  
- 2008 | Efficient Traversal of Mesh Edges using Adjacency Primitives.  
*SIGGRAPH Asia 2008* paper talk.  
Singapore, December, 2008.  
  
Parallel View-Dependent Refinement of Progressive Meshes.  
*SIGGRAPH Asia 2008 Parallel Computing for Graphics* course.  
Singapore, December, 2008.  
  
Efficient Traversal of Mesh Edges using Adjacency Primitives.  
*Graphics group talk*  
IIT Delhi, New Delhi, India, November, 2008
  
- 2007 | Fast Triangle Order Optimization for Vertex Locality and Reduced Overdraw.  
*SIGGRAPH 2007* paper talk.  
San Diego, CA, August, 2007.

- 2006 | Triangle Order Optimization for Graphics Hardware Computation Culling.  
*Computer Science Colloquium talk.*  
Hong Kong University of Science and Technology, Hong Kong, November, 2006.
- Out-of-Core Rendering of Large Meshes with Progressive Buffers.  
*SIGGRAPH 2006 Advanced Real-Time Rendering in 3D Graphics and Games.*  
Los Angeles, CA, August, 2006.
- Triangle Order Optimization for Graphics Hardware Computation Culling.  
*I3D 2006 paper talk.*  
Redwood City, CA, March, 2006.
- Efficient Methods for Parameterizing and Rendering Large Models.  
*Computer Science Colloquium talk.*  
Hong Kong University of Science and Technology, Hong Kong, March, 2006.
- Efficient Methods for Parameterizing and Rendering Large Models.  
*Computer Science Colloquium talk.*  
The University of Hong Kong, Hong Kong, March, 2006.
- 2005 | Rendering Techniques for the ATI X1800 Demos.  
*Korean Gaming Conference.*  
Seoul, Korea, November, 2005.
- Practical Dynamic Parallax Occlusion Mapping.  
*Korean Gaming Conference.*  
Seoul, Korea, November, 2005.
- The HLSL Shading Language.  
*SIGGRAPH 2005 GPU Rendering and Shading course.*  
Los Angeles, CA, August, 2005.
- Early-Z Culling and Dynamic Flow Control in Graphics Hardware.  
*SIGGRAPH 2005 GPU Rendering and Shading course.*  
Los Angeles, CA, August, 2005.
- Progressive Buffers: View-Dependent Geometry and Texture LOD Rendering.  
*2005 Symposium on Geometry Processing paper talk.*  
Vienna, Austria, June, 2005.
- Efficient Rendering Techniques in Ruby: The DoubleCross  
*Graphics Group talk.*  
Hong Kong University of Science and Technology, Hong Kong, February, 2005.
- 2004 | Pushing Pixels in Real-Time.  
*Computer Graphics class.*  
Harvard University, Cambridge, MA, December, 2004.
- Efficient Rendering Techniques in Ruby: The DoubleCross  
*Graphics Group talk.*

- Princeton University, Princeton, NJ, November, 2004.
- Efficient Rendering Techniques in Ruby: The DoubleCross  
*Graphics Group talk.*  
MIT, Cambridge, MA, October, 2004.
- Efficient Rendering Techniques in Ruby: The DoubleCross  
*GDC Europe 2004.*  
London, August, 2004.
- Rendering Techniques in Ruby: The DoubleCross  
*European Computer Trade Show.*  
London, September, 2004.
- Real-Time Skin Rendering on Graphics Hardware.  
*SIGGRAPH 2004 sketch talk.*  
Los Angeles, CA, August, 2004.
- 2003 | Sampling-Efficient Mesh Parametrization.  
*Ph.D. Final Oral Examination.*  
Harvard University, Cambridge, MA, May, 2003.
- Sampling-Efficient Mesh Parametrization.  
*Graphics Seminar on Geometric Modeling.*  
Harvard University, Cambridge, MA, March, 2003.
- 2002 | Multi-Chart Geometry Images.  
*Microsoft Research Graphics Group.*  
Redmond, WA, August, 2002.
- Signal-Specialized Parametrization.  
*2002 Eurographics Workshop on Rendering paper talk.*  
Piza, Italy, June, 2002.
- A Scalable, Distributed Algorithm for Efficient Task Allocation.  
*International Joint Conference on Autonomous Agents and Multi-Agent Systems pa-  
per talk.*  
Bologna, Italy, June, 2002.
- 2001 | Content-Driven Parametrization.  
*Microsoft Research Graphics Group.*  
Redmond, WA, August, 2001.
- Texture Mapping Progressive Meshes.  
*SIGGRAPH 2001 paper talk.*  
Los Angeles, CA, August, 2001.
- Texture Mapping Progressive Meshes.  
*Microsoft Research.*  
Redmond, WA, August, 2001.

	Discontinuity Edge Overdraw. <i>I3D 2001</i> paper talk. Chapel Hill, NC, March, 2001.
2000	Discontinuity Edge Overdraw. <i>Microsoft Research Graphics Group</i> . Redmond, WA, August, 2000.
	Silhouette Clipping. <i>SIGGRAPH 2000</i> paper talk. New Orleans, LA, July, 2000.
	Silhouette Clipping. <i>Microsoft Research</i> . Redmond, WA, July, 2000.
	Texture Mapping Progressive Meshes. <i>Microsoft Research Graphics Group</i> . Redmond, WA, July, 2000.
1999	Silhouette Clipping. <i>4th Harvard Industrial Partnership Workshop</i> . Cambridge, MA, October, 1999.

## Awards and Accomplishments

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PAPERS	<p><b>Accelerating Real-Time Shading with Reverse Reprojection Caching</b> was voted second best paper in <i>ACM SIGGRAPH Symposium on Graphics Hardware 2007</i>.</p> <p><b>Triangle Order Optimization for Graphics Hardware Computation Culling</b> was selected top three in <i>2006 ACM Symposium on Interactive 3D Graphics and Games</i> and invited for talk at <i>SIGGRAPH 2006</i>.</p>
FELLOWSHIPS	<p>Microsoft Research Graduate Fellowship, 2000-2002 (covers tuition and monthly stipend).</p> <p>Harvard University Scholarship, 1998-1999 (covers tuition and monthly stipend).</p>
PROGRAMMING CONTESTS	<p>Second Place in the IBM Visual Java Challenge, hosted by ACM's 22nd International Collegiate Programming Contest World Finals, Atlanta, GA, February 1998 (team of four).</p> <p>First Place in the 1997 ACM Greater New York Metropolitan Area Programming Contest, West Point, NY, November 1997 (team of three). Advanced to the World Finals from a field of over 1250 teams.</p>
MISCELLANEOUS	<p>Member of the Golden Key National Honor Society at SUNY Stony Brook, 1998.</p> <p>President, elected by classmates, of junior high school graduation committee, Brasília, Brazil, 1991.</p>

## Additional Information

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LANGUAGES	Portuguese (native) English (fluent) Spanish (fluent)
PROFICIENCY	Quantitative GRE: 800/800; Analytical GRE: 790/800
TEST SCORES	TOEFL (Test of English as a Foreign Language): 633/677

For further information and electronic versions of my publications: <http://www.cse.ust.hk/~psander>  
Last updated in August 2011.