

Pedro V. Sander



General Data

BIRTHPLACE	Niterói, Rio de Janeiro, Brazil
RESIDENCE	Hong Kong
EMAIL	psander@cse.ust.hk
WEB PAGE	http://www.cse.ust.hk/~psander
MAILING ADDRESS	Department of Computer Science and Engineering The Hong Kong University of Science and Technology Clear Water Bay, Kowloon, Hong Kong
OFFICE LOCATION	Academic Building, Room 3554 (near lifts 25-26)

Education

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

Work Experience

2016-PRESENT	<i>Undergraduate Director</i>
2012-PRESENT	<i>Associate Professor</i>
2006-2012	<i>Assistant Professor</i> The Hong Kong University of Science and Technology Member of the Vision and Graphics Group (VISGRAPH) and the Faculty of the Department of Computer Science and Engineering.
2006	<i>Staff Software Engineer</i>
2003-2006	<i>Senior Software Engineer</i> 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).
2000, 2001, 2002 (SUMMER)	<i>Research Intern</i> Microsoft Research Member of the Graphics Research Group of the Redmond lab. Research in geometry processing.
1999-2003	<i>Teaching Fellow and Research Assistant</i> Harvard University Teaching fellow for undergraduate and graduate computer graphics courses; research assistant in computer graphics leading up to the dissertation.

1998 (SUMMER)	<i>Software Design Engineer in Test Intern</i> Microsoft Corporation Summer internship in Microsoft's DirectX team in Redmond.
1997-1998	<i>Teaching Assistant and Research Assistant</i> Stony Brook University Teaching assistant for an undergraduate computer graphics course; research in computer graphics.
1997 (SUMMER)	<i>Systems Professional</i> Goldman, Sachs, and Co. System design and implementation at the Manhattan office.

University Teaching

HKUST only

FALL 2016	COMP4451: Game Programming COMP5411: Advanced Computer Graphics (1/2 load)
SPRING 2016	COMP1022P: Introduction to Computing with Java
FALL 2015	COMP2011: Programming Fundamentals and Methodology COMP5411: Advanced Computer Graphics (1/2 load)
SUMMER 2015	IELM4320: Design Thinking (1/8 load)
SPRING 2015	COMP4451: Game Programming
FALL 2014	COMP5411: Advanced Computer Graphics (1/2 load)
FALL 2013	COMP1022P: Introduction to Computing with Java COMP5411: Advanced Computer Graphics (1/2 load)
SUMMER 2013	IELM4320: Design Thinking (1/8 load)
SPRING 2013	COMP1022P: Introduction to Computing with Java
FALL 2012	COMP1022P: Introduction to Computing with Java COMP5411: Advanced Computer Graphics (1/2 load)
SPRING 2012	COMP6411: Real-Time Rendering CSIT5400: Computer Graphics (4 weeks)
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

2013		<i>Metagraphics: Impact Papers from SIGGRAPH/TOG and their interconnections</i> ACM SIGGRAPH Asia Tutorial course one of two organizers/speakers
2008		<i>Parallel Computing for Graphics: Beyond Programmable Shading</i> ACM SIGGRAPH Asia Full day course one of many invited speakers
2006		<i>GPU Shading and Rendering</i> ACM SIGGRAPH Full day course one of many invited speakers
2005		<i>Advanced Real-Time Rendering in 3D Graphics and Games</i> ACM SIGGRAPH Full day course one of many invited speakers

Conference Organization

2017		Eurographics Symposium on Rendering <i>Papers Co-chair</i>
2015		SIBGRAPI <i>Papers Co-chair</i>
2015		ACM I3D <i>Papers Co-chair</i>
2014		ACM I3D <i>General Co-chair</i>

- 2012 | **Pacific Graphics**
Papers Co-chair

- 2011 | **ACM SIGGRAPH Asia**
Courses Chair and Conference Committee member

- 2011 | **IEEE Pacific Visualization**
Organization Co-chair and Finance Chair

Other Conference and Journal Service

- 2016 | *Papers Committee, ACM SIGGRAPH*

- 2015 | *Papers Committee, EGSR*

- 2014 | *Papers Committee, ACM SIGGRAPH Asia*
Papers Committee, EGSR

- 2013 | *Papers Committee, ACM SIGGRAPH*
Real-Time Live Jury, ACM SIGGRAPH
Papers Committee, ACM I3D
Papers Committee, Symposium on Geometry Processing

- 2012 | *Papers Committee, ACM SIGGRAPH*
Papers Committee, ACM I3D
Papers Committee, Symposium on Geometry Processing
Papers Committee, Shape Modeling International

- 2011 | *Papers Committee, ACM SIGGRAPH Asia*
Program Committee, Pacific Graphics
Program Committee, EGSR
Papers Committee, ACM I3D
Program Committee, IEEE SIBGRAPI
Papers Committee, Shape Modeling International

- 2010 | *Papers Committee, ACM SIGGRAPH*
Associate Editor, GMOD (2010-present)
Program Committee, EGSR
Papers Committee, ACM I3D
Program Committee, Pacific Graphics
Papers Committee, Shape Modeling International

- 2009 | *Papers Committee and Session Chair, ACM SIGGRAPH*
Program Committee, EGSR
Program Committee, Pacific Graphics
Papers Committee, ACM I3D
Program Committee, ISVC

- 2008 | *Program Committee, CASA*
Program Committee, Pacific Graphics
Program Committee, IEEE SIBGRAPI

	<i>Program Committee, IEEE SMI Papers Committee, ACM I3D</i>
2007	<i>Program Committee, IEEE SIBGRAPI Program Committee, Pacific Graphics</i>
2006	<i>Program Committee, IEEE SIBGRAPI</i>

Selected 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, 2016) Represented HKUST at Hong Kong Corporate Games</p>
CSE	<p>Undergraduate Director (2016-) Manage issues related to the Department's undergraduate program.</p> <p>Associate Undergraduate Director (2015-2016) Manage issues related to the Department's undergraduate program.</p> <p>Coordinator of Computer Science B.Sc. Program (2011-2016) Manage the B.Sc. double major program for elite students and serve as advisor to all enrolled students.</p> <p>Programming Course for Direct Entry students (2008-2013). Coordinated the programming course for direct entry students.</p> <p>Member of Executive Committee, 2015-present. Member of UG Committee, 2015-present. Chair of CSE Facilities Committee, 2012-2013. Member of CSE Facilities Committee, 2009-2012. Member of CSE Recruitment and Outreach committee, 2006-2013. 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>Bo Zhang, 2015-present (co-advised with Amine Bermak) Mingming He, 2015-present Songfang Han, 2014-present Weidan Xiong, 2014-present (co-advised with Ajay Joneja) Ge Chen, 2010-present Jing Liao, 2011-2015 (RGC HK Ph.D. Fellowship recipient)</p>
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	Lei Yang, 2007-2011 (FP: Bosch Research) Hongwei Li, 2008-2010 (co-advised with Philip Fu; FP: Microsoft)
M.PHIL.	Ligeng Li, 2014-present Zhaohua Li, 2012-2014 Yutong Zhao, 2011-2012 Kenneth Tse, 2008-2010 (FP: Mobile game developer in HK) Xuxiang Lin, 2008-2010 (FP: Credit Suisse) Liang Hu, 2006-2009 (FP: Google Shanghai)
B.SC. / B.ENG.	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) Rui Fang, FYT 2006-2007 (co-advised with Qiong Luo)
INTERNSHIP ATI RESEARCH	Diego Nehab, summer 2005 (Ph.D., Princeton) Joshua Barczak, summer 2005 (M.S., Maryland)

Student Committee Memberships

HKUST Computer Science students unless otherwise noted

PH.D. DEFENSE	Panagiotis Parchas, 2017 Wai King So, 2017 Thilina Weerasinghe, 2015 (IELM department) Panpan Xu, 2014 Jing Liao, 2014 (advisor) Conglei Shi, 2014 Xinagzhi Wei, 2013 (IELM department) 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, 2008 (ECE department) Kin-Chung Au, 2007
PH.D. PROPOSAL	Ge Chen, 2016 Jinglu Wang, 2016 Panagiotis Parchas, 2016 Jingbo Liu, 2015 (chairperson) Thilina Weerasinghe, 2015 (IELM department) Yun Wang, 2014 (chairperson) Jing Liao, 2014 (advisor) Peng Zhao, 2012 (chairperson) Nan Cao, 2012 (chairperson) Honghui Zhang, 2012 Lei Yang, 2011 (advisor) Tian Fang, 2011

	Weiwei Cui, 2011
	Pitchaya Sitthi-amorn, 2010 (University of Virginia, USA)
	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	Zhutian Chen, 2016
	Mingming He, 2016 (supervisor)
	Santawat Thanyadit, 2016 (chairperson)
	Yun Wang, 2014 (chairperson)
	Lu Lu, 2013 (chairperson)
	Jinglu Wang, 2013
	Liao Jing, 2013 (advisor)
	Jingbo Liu, 2012 (chairperson)
	Ge Chen, 2012 (advisor)
	Chao Yang, 2012
	Nan Cao, 2011
	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	Sing Yu Siu, 2016 (chairperson)
	Evan Hann, 2016
	Baoxue Zhao, 2014 (chairperson)
	Zhaohua Li, 2014 (advisor)
	Yang Liu, 2014
	Tian Han, 2013
	Lu Chen, 2013 (chairperson)
	Zhexi Wang 2013 (chairperson)
	Pengfei Xu, 2012
	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

RGC/GRF	RGC CERG #16208814 (PI) - Fine-grained, optimized image and video morphing. 2015-2017. HK\$500,000.
	RGC CERG #618513 (PI) - Depth pre-sorting of mesh triangles for efficient scene rendering. 2013-2016. HK\$645,500.
	RGC CERG #619509 (PI) - Framebuffer Techniques for Fast, Approximate Pixel Shading. 2009-2013. 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 SB106/07.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

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.
US Pat. 7071936 - Filed May 1, 2002 - Microsoft Corporation.

Academic Publications

Electronic version includes hyperlink to PDF where available.

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

- JOURNAL | Jing Liao, Diego Nehab, Hugues Hoppe, **Pedro V. Sander**. **New controls for combining images in correspondence**. IEEE Transactions on Visualization and Computer Graphics, 22(7), 2016 (presented at I3D 2016).
- Jing Liao, Rodolfo Lima, Diego Nehab, Hugues Hoppe, **Pedro V. Sander**. **Semi-Automated Video Morphing**. Computer Graphics Forum (EGSR), 33(4), 51-60, 2014.
- Jing Liao, Rodolfo Lima, Diego Nehab, Hugues Hoppe, **Pedro V. Sander**, Jinghui Yi. **Automating Image Morphing Using Structural Similarity on a Halfway Domain**. ACM Transactions on Graphics, Volume 33 Issue 5 (presented at SIGGRAPH 2014).
- Ge Chen, **Pedro V. Sander**, Diego Nehab, Lei Yang, Nicky Hu. **Depth Pre-sorted Triangle Lists**. ACM Transactions on Graphics, Volume 31, Issue 6 (SIGGRAPH Asia 2012). *Selected as one of the "Notable computing books and articles -- 2012" by the ACM Computing Reviews*.
- Daniel Scherzer, Lei Yang, Oliver Mattausch, Diego Nehab, **Pedro V. Sander**, Michael Wimmer, Elmar Eisemann. **Temporal Coherence Methods in Real-Time Rendering**. Computer Graphics Forum, 31(8):2378-2408, December 2012.
- Yutong Zhao, Fu Kit Sheong, Jian Sun, **Pedro V. Sander**, Xuhui Huang. **A Fast Parallel Clustering Algorithm for Molecular Simulation Trajectories**. Journal of Computational Chemistry, 2012.
- Lei Yang, Kenneth Tse, **Pedro V. Sander**, Jason Lawrence, Diego Nehab, Hugues Hoppe, Clara Wilkins. **Image-based Bidirectional Scene Reprojection**. ACM Transactions on Graphics, Volume 30, Issue 6 (SIGGRAPH Asia 2011).
- Lei Yang, **Pedro V. Sander**, Jason Lawrence, Hugues Hoppe. **Antialiasing Recovery**. ACM Transactions on Graphics, Volume 30, Issue 3 (presented at SIGGRAPH 2011).
- Hongwei Li, Li-Yi Wei, **Pedro V. Sander**, Chi-Wing Fu. **Anisotropic Blue Noise Sampling**. ACM Transactions on Graphics, Volume 29, Issue 6 (SIGGRAPH Asia 2010).
- Lei Yang, Diego Nehab, **Pedro V. Sander**, Pitchaya Sitthi-amorn, Jason Lawrence, Hugues Hoppe. **Amortized Supersampling**. ACM Transactions on Graphics, Volume 28, Issue 5 (SIGGRAPH Asia 2009).

Bingsheng He, Ke Yang, Rui Fang, M. Lu, Naga K. Govindaraju, Qiong Luo, and Pedro V. Sander. **Relational Query Co-Processing on Graphics Processors**. ACM Transactions on Database Systems (TODS), Volume 34, Issue 4, December 2009.

Liang Hu, Pedro V. Sander, Hugues Hoppe. **Parallel View-Dependent Level of Detail Control**. IEEE Transactions on Visualization and Computer Graphics, Volume 16, Issue 5.

Pedro V. Sander, Diego Nehab, Eden Chlamtac, Hugues Hoppe. **Efficient Traversal of Mesh Edges using Adjacency Primitives**. ACM Transactions on Graphics, Volume 27, Issue 5 (SIGGRAPH Asia 2008).

Pitchaya Sitthi-amorn, Jason Lawrence, Lei Yang, Pedro V. Sander, Diego Nehab, Jiahe Xi. **Automated Reprojection-Based Pixel Shader Optimization**. ACM Transactions on Graphics, Volume 27, Issue 5 (SIGGRAPH Asia 2008).

Lei Yang, Pedro V. Sander, Jason Lawrence. **Geometry-Aware Framebuffer Level of Detail**. Eurographics Computer Graphics Forum, Volume 27, Issue 4 (Eurographics Symposium on Rendering 2008).

Pedro V. Sander, Diego Nehab, Joshua Barczak. **Fast Triangle Order Optimization for Vertex Locality and Reduced Overdraw**. ACM Transactions on Graphics, Volume 26, Issue 3 (SIGGRAPH 2007).

CONFERENCE Bo Zhang, Pedro V. Sander, Amine Bermak. **Registration-Based Retargeted Image Quality Assessment**. ICASSP 2017 (to appear).

Bo Zhang, Pedro V. Sander, Amine Bermak. **Gradient Magnitude Similarity Deviation on Multiple Scales for Color Image Quality Assessment**. ICASSP 2017 (to appear).

Bo Zhang, Xiaopeng Zhong, Bo Wang, Pedro V. Sander, Amine Bermak. **Wide dynamic range PSD algorithms and their implementation for compressive imaging**. ISCAS 2016: 2727-2730.

Songfang Han, Pedro V. Sander. **Triangle Reordering for Reduced Overdraw in Animated Scenes**. ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games 2016. Seattle, USA, February 2016. (to appear)

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.

Ke Yang, Yinan Li, Qiong Luo, Pedro V. Sander, and Jiaoying Shi. **I3DC: Interactive 3D Cubes on Graphics Processors**. In Proceedings of International Conference on Data Engineering (ICDE), Shanghai, China, Mar 29-Apr 4 2009: pp. 1475-1478.

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.

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.

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.

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.*

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.

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.

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 a reprise talk at SIGGRAPH 2006.*

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.

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.

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.

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.

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- EDITED BOOK | John Keyser, **Pedro V. Sander**. **Proceedings of the 19th Symposium on Interactive 3D Graphics and Games**. San Francisco, USA, 2015.
- Christoph Bregler, **Pedro V. Sander**, Michael Wimmer. **Computer Graphics Forum, vol 31, issue 7**. Special Issue for Pacific Graphics 2012. Hong Kong, China, 2012.
- 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.
- David Gosselin, **Pedro V. Sander**, Jason L. Mitchell. **Drawing a Crowd**. ShaderX3: Advanced Rendering With DirectX And OpenGL, Charles River Media, 2004.
- David Gosselin, **Pedro V. Sander**, Jason L. Mitchell. **Methods for Real-time Skin Rendering**. ShaderX3: Advanced Rendering With DirectX And OpenGL, Charles River Media, 2004.
- REPORT | Daniel Scherzer, Lei Yang, Oliver Mattausch, Diego Nehab, **Pedro V. Sander**, Michael Wimmer, Elmar Eisemann. **A Survey on Temporal Coherence Methods in Real-Time Rendering**. Eurographics 2011 State of the Art Reports, pages 101-126. 2011. (*refereed publication with oral presentation at Eurographics*)

CONF. POSTER, DEMO, SKETCH	<p>Hongwei Li, Diego Nehab, Li-Yi Wei, Pedro V. Sander, Chi-Wing Fu. Fast capacity constrained Voronoi tessellation. In <i>I3D 2010</i> posters program.</p> <p>Ke Yang, Bingsheng He, Qiong Luo, Pedro V. Sander, and Jiaoying Shi. Stack-Based Parallel Recursion on Graphics Processors. In Proceedings of the 14th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPOPP), Raleigh, NC, USA, February 14-18, 2009: pp. 299-300.</p> <p>Rui Fang, Bingsheng He, Mian Lu, Ke Yang, Naga K. Govindaraju, Qiong Luo, Pedro V. Sander. GPUQP: Query Co-Processing using Graphics Processors. In <i>SIGMOD 2007</i> demonstration paper program.</p> <p>Diego Nehab, Pedro V. Sander, John Isidoro. The Real-Time Reprojection Cache. In <i>SIGGRAPH 2006</i> sketches program.</p> <p>Pedro V. Sander, John Isidoro. Compressing and Managing Large Datasets for The Real-Time Parthenon Demo. In <i>I3D 2006</i> posters program.</p> <p>Pedro V. Sander, Natalya Tatarchuk, Jason L. Mitchell. Early-Z Culling for Efficient Fluid Flow Simulation. In <i>I3D 2005</i> posters program.</p> <p>Pedro V. Sander, David Gosselin, Jason L. Mitchell. Real-Time Skin Rendering in Graphics Hardware. In <i>SIGGRAPH 2004</i> sketches program.</p>
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Other Key Projects

GIGAPIXEL IMAGES	<p>Urca 152GP (<i>World Record for largest digital photograph, September 2010</i>) http://www.gigapan.org/gigapans/58857/ 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>Corcovado 67GP (<i>World Record for largest digital photograph, July 2010</i>) http://www.gigapan.org/gigapans/66020/ 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>ATI "Screen Space" Screensaver 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>ATI "Parthenon" Real-Time Demo 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.</p>

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

- 2015 | Computer Graphics: Closing the Gap on Reality.
World Economic Forum.
Davos, Switzerland, January, 2015

- 2011 | Techniques for Accelerating Real-Time Rendering
CSIAM Geometric Design & Computing 2011 keynote
Guangzhou, China, November, 2011

- 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.

- 2007 | Fast Triangle Order Optimization for Vertex Locality and Reduced Overdraw.
SIGGRAPH 2007 paper talk.
San Diego, CA, August, 2007.

- 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.
- 2004 | Pushing Pixels in Real-Time.
Computer Graphics seminar.
Harvard University, Cambridge, MA, December, 2004.
- Efficient Rendering Techniques in Ruby: The DoubleCross
Graphics Group seminar.
Princeton University, Princeton, NJ, November, 2004.
- Efficient Rendering Techniques in Ruby: The DoubleCross
Graphics Group seminar.
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
paper 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.
I3D 2001 paper talk.
Chapel Hill, NC, March, 2001.
- 2000 | Discontinuity Edge Overdraw.
Microsoft Research Graphics Group.
Redmond, WA, August, 2000.
- Silhouette Clipping.
SIGGRAPH 2000 paper talk.
New Orleans, LA, July, 2000.
- Silhouette Clipping.
Microsoft Research.
Redmond, WA, July, 2000.
- Texture Mapping Progressive Meshes.

- Microsoft Research Graphics Group.
 Redmond, WA, July, 2000.
- 1999 Silhouette Clipping.
 4th Harvard Industrial Partnership Workshop.
 Cambridge, MA, October, 1999.

Additional Information and Awards

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| PAPERS | <p>Depth Pre-sorted Triangle Lists was selected as one of the “Notable computing books and articles -- 2012” by the ACM Computing Reviews.</p> <p>Accelerating Real-Time Shading with Reverse Reprojection Caching was voted second best paper in <i>ACM SIGGRAPH Symposium on Graphics Hardware 2007</i>.</p> <p>Triangle Order Optimization for Graphics Hardware Computation Culling was selected top three in <i>2006 ACM Symposium on Interactive 3D Graphics and Games</i> and invited for a reprise 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>Paul and May Chu Sportsman of the Year Award 2011-12, HKUST, October 2012.</p> <p>President, elected by classmates, of junior high school graduation committee, Brasília, Brazil, 1991.</p> |
| LANGUAGES | <p>Portuguese (native)
 English (fluent)
 Spanish (fluent)</p> |

An electronic version of this CV with links to publications and projects can be found at <http://www.cse.ust.hk/~psander>

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 Last updated in January 2017