Jinwei Gu

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EDUCATION:

9/2005-5/2010	**Columbia University**	Ph.D. in Computer Science (Honor: PhD with Distinction)
9/2002-5/2005	**Tsinghua University**	M.S. in Automation (Honor: Outstanding Master Thesis Award)
9/1998-5/2002	**Tsinghua University**	B.S. in Automation

EMPLOYMENT:

11/2015-present	NVIDIA Research	Senior Research Scientist (Mobile Visual Computing)
11/2013-10/2015	Futurewei Technologies (Huawei R&D, USA)	Senior Researcher in Media Lab (New Jersey Office)
9/2010-6/2013	Rochester Institute of Technology (RIT)	Assistant Professor of the Chester F. Carlson Center for Imaging Science
9/2005-5/2010	Columbia University	Graduate Research Assistant of the CAVE Laboratory in Computer Science
5/2008-8/2008	Adobe Research	Research Intern in the CTL Lab
2003-2004	Microsoft Research Asia (MSRA)	Research Intern in the Visual Computing Lab

RESEARCH INTERESTS:

Computer vision; machine learning; computational camera; 3D reconstruction; visual SLAM; appearance modeling; pattern recognition.

HONORS:

Ph.D. Degree with Distinction, Columbia University, 2010.
Ph.D. Service Award, Columbia University, 2009.
Principal Scholarship Award, Tsinghua University, 2005.
Outstanding M.S. Thesis Award, Tsinghua University, 2005.

PUBLICATIONS[1]*:

Refereed journal articles:

J13. Chao Liu* and **Jinwei Gu**. "Discriminative Illumination: Per-Pixel Classification of Raw Materials based on Optimal Projections of Spectral BRDF", *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), accepted (2013). [citation: 47]*

J12. Dengyu Liu*, **Jinwei Gu**, Yasunobu Hitomi, Mohit Gupta, Tomoo Mitsunaga, and Shree Nayar. "Efficient Space-Time Sampling with Pixel-wise Coded Exposure for High Speed Imaging", *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), accepted (2013). [citation: 29]*

J11. **Jinwei Gu**, Shree Nayar, Eitan Grinspun, Peter Belhumeur, and Ravi Ramamoorthi. "Compressive Structured Light for Recovering Inhomogeneous Participating Media," *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 99* (2012) [citation: 90]

J10. **Jinwei Gu**, Ravi Ramamoorthi, Peter Belhumeur and Shree Nayar. "Removing Image Artifacts Due to Dirty Camera Lenses and Thin Occluders." *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia),* Dec. 2009. [citation: 42]

J9. Wojciech Matusik, Boris Ajdin, **Jinwei Gu**, Jason Lawrence, Hendrik P.A. Lensch, Fabio Pellacini, and Szymon Rusinkiewicz. "Printing Spatially-Varying Reflectance". *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia),* Dec. 2009. [citation: 66]

J8. Jie Zhou, Fanglin Chen, and **Jinwei Gu**. "A Novel Algorithm for Detecting Singular Points from Fingerprint Images". *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI),* vol.31, no. 7, 2009. [citation: 78]

J7. **Jinwei Gu**, Chien-I Tu, Ravi Ramamoorthi, Peter Belhumeur, Wojciech Matusik, and Shree Nayar. "Time-Varying Surface Appearance: Acquisition, Modeling, and Rendering". *ACM Transactions on Graphics (Proceedings of SIGGRAPH),* vol. 25, no. 3, June 2006, pp 762-771. [citation: 106]

J6. **Jinwei Gu**, Jie Zhou, and Chunyu Yang. "Fingerprint Recognition by Combining Global Structure and Local Cues". *IEEE Transactions on Image Processing*, vol. 15, no. 7, 2006, pp 1952-1964. [citation: 124]

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[1] In computer vision, one of the leading journals is the IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), Leading conferences are IEEE CVPR, ICCV and ECCV. Papers in these conferences are rigorously reviewed, with acceptance rates around 20%, and below 5% for oral presentations. In computer graphics, the SIGGRAPH conferences (SIGGRAPH & SIGGRAPH Asia) are the leading venue for publishing research in computer graphics, with acceptance rates ranging from 15%-20%. Since 2002, the proceedings have also been published as a special issue of the ACM Transactions on Graphics (TOG), the leading journal in graphics. The EuroGraphics Symposium on Rendering (EGSR) is the leading venue for rendering research (second only to the SIGGRAPH conference), and has a competitive acceptance rate of 25-35%. In computational photography, the leading conference is IEEE ICCP, with the acceptance rates around 20%.
* Co-authors are my advisee (graduate students, interns or visiting scholars).

J5. Wei Jiang, Guihua Er, Qionghai Dai, and **Jinwei Gu**. "Similarity-based Online Feature Selection in Content-based Image Retrieval". *IEEE Transactions on Image Processing*, vol. 15, no. 3, 2006, pp 702-712. [citation: 116]

J4. Wei Jiang, Guihua Er, Qionghai Dai, and **Jinwei Gu**. "Hidden Annotation for Image Retrieval with Long-term Relevance Feedback Learning". *Pattern Recognition*, vol.38, no.11, 2005, pp. 2007-2021. [citation: 17]

J3. **Jinwei Gu**, Jie Zhou, and David Zhang. "A Combination Model for Orientation Field of Fingerprints". *Pattern Recognition*, vol. 37, no.3, 2004, pp. 543-553. [citation: 91]

J2. Jie Zhou and **Jinwei Gu**, "A Model-based Method for the Computation of Fingerprints' Orientation Field". *IEEE Transactions on Image Processing,* vol. 13, no. 6, 2004, pp 821-835. ***[citation: 206]***

J1. Jie Zhou and **Jinwei Gu**, "Modeling Orientation Fields of Fingerprints with Rational Complex Functions". *Pattern Recognition,* vol. 37, no. 2, 2004, pp 389-391. [citation: 97]

Refereed conference proceedings:

C22. Kihwan Kim, **Jinwei Gu**, Stephen Tyree, Pavlo Molchanov, Matthias Niebster, and Jan Kautz. *"A Lightweight Approach for Reflectance Estimation on-the-fly".* arXiv preprint 1705.07162.

C21. Suren Jayasuriya*, Orazio Gallo, **Jinwei Gu**, Timo Aila, and Jan Kautz. *"Reconstructing Intensity Images from Binary Spatial Gradient Cameras", CVPR 2017 Embedded Vision Workshop (Oral)*

C20. Zhaopeng Cui*, **Jinwei Gu**, Boxin Shi, Ping Tan, and Jan Kautz. *"Polarimetric Multi-View Stereo". CVPR 2017*

C19. **Jinwei Gu**, Xiaodong Yang, Shalini Gupta and Jan Kautz. *"Dynamic Facial Analysis: From Bayesian Filtering to Recurrent Neural Networks". CVPR 2017*

C18. Suren Jayasuriya*, Orazio Gallo, **Jinwei Gu**, and Jan Kautz. *"Deep Learning with Energy-efficient Binary Gradient Cameras", arXiv preprint: 1612.00986.*

C17. Wei Jiang and **Jinwei Gu**. " Video Stitching with Spatial-Temporal Content-Preserving Warping". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Computational Cameras and Displays Workshop,* 2015. [citation: 10]

C16. Chao Liu*, Gefei Yang*, and **Jinwei Gu**. "Learning Discriminative Illumination and Filters for Raw Material Classification with Optimal Projections of Bidirectional Texture Functions". *IEEE Conference on Computer Vision and Pattern Recognition*

(CVPR), 2013. [citation: 13]

C15. Jun Jiang*, Dengyu Liu*, **Jinwei Gu** and Sabine Susstrunk. "What is the Space of Spectral Sensitivity Functions for Digital Color Cameras?" *IEEE Workshop on the Applications of Computer Vision (WACV)*, 2013. [citation: 68]

C14. Jun Jiang* and **Jinwei Gu**. "An Exemplar-Based Method for Automatic Visual Editing and Retouching of Fine Art Reproduction" *Color and Imaging Conference (CIC),* 2013.

C13. **Jinwei Gu** and Chao Liu*. "Discriminative Illumination: Per-Pixel Classification of Raw Materials based on Optimal Projections of Spectral BRDFs". *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2012 [**Oral**] [citation: 47]

C12. Jun Jiang* and **Jinwei Gu**. "Recovering Spectral Reflectance under Commonly Available Lighting Conditions*. IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Computational Camera and Display Workshop*, 2012. [**Oral**] [citation: 12]

C11. Adria Fores*, James Ferwerda, and **Jinwei Gu**. "Toward a Perceptually Based Metric for BRDF Modeling", *Proceedings IS&T/SID 20th Color Imaging Conference, November*, 2012. [citation: 10]

C10. **Jinwei Gu,** Toshihiro Kobayashi*, Mohit Gupta, and Shree Nayar. "Multiplexed Illumination for Scene Recovery in the Presence of Global Illumination". *IEEE International Conference on Computer Vision (ICCV)*, 2011 [**Oral**] [citation: 39]

C9. Yasunobu Hitomi*, **Jinwei Gu**, Mohit Gupta, Tomoo Mitsunaga, and Shree Nayar. "Video From a Single Exposure Coded Photograph using a Learned Over-Complete Dictionary". *IEEE International Conference on Computer Vision (ICCV)*, 2011. [citation: 103]

C8. **Jinwei Gu**, Yasunobu Hitomi, Tomoo Mitsunaga, and Shree Nayar. "Coded Rolling Shutter Photography: Flexible Space-Time Sampling". *IEEE International Conference on Computational Photography (ICCP),* Mar. 2010. [**Oral**] *[citation: 64]*

C7. **Jinwei Gu**, Shree Nayar, Eitan Grinspun, Peter Belhumeur, and Ravi Ramamoorthi. "Compressive Structured Light for Recovering Inhomogenous Participating Media". *European Conference on Computer Vision (ECCV),* Oct. 2008, pp 845-858. [**Oral**] *[citation: 90]*

C6. **Jinwei Gu**, Ravi Ramamoorthi, Peter Belhumuer, and Shree Nayar. "Dirty Glass: Modeling and Rendering Contaminations on Transparent Surfaces". *Eurographics Symposium on Rendering (EGSR),* June 2007. [**Oral**] *[citation: 23]*

C5. Jie Zhou, **Jinwei Gu,** and David Zhang, "Singular Points Analysis in Fingerprints Based on Topological Structure and Orientation Field". *International Conference of Biometrics (ICB),* August 2007, pp 261-270. *[citation: 28]*

C4. Stephen Lin, **Jinwei Gu**, Shuntaro Yamazaki, and Heung-Yeung Shum. "Radiometric Calibration from a Single Image". *IEEE Computer Society Conference*

on Computer Vision and Pattern Recognition (CVPR), June 2004, vol. 2, pp 938-945. [**Oral**] *[citation: 164]*

C3. Wei Jiang, Mingjing Li, Hongjiang Zhang, and **Jinwei Gu**. "Online Feature Selection based on Generalized Feature Contrast Model". *IEEE Interational Conference on Multimedia and Expo (ICME), 2004.* [citation: 7]

C2. **Jinwei Gu** and Jie Zhou. "Model-based Orientation Field Estimation for Fingerprint Recognition". *IEEE International Conference on Image Processing (ICIP),* 2003. [citation: 5]

C1. **Jinwei Gu** and Jie Zhou, "A Novel Model for Orientation Field of Fingerprints". *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR),* June 2003, vol 2, pp 493-498. *[citation: 54]*

Book Chapters, monographs and tutorials:

Jie Zhou, David Zhang, **Jinwei Gu**, and Nannan Wu. "Graphical Representation of Fingerprint Images". Integrated Image and Graphics Technologies, Kluwer academic publisher, Boston, 2004.

Theses

"Measuring, Modeling, and Synthesis of Time-Varying Appearance of Natural Phenomena", Columbia University, May 2010. (PhD Thesis)

"Fingerprint Orientation Field Modeling and Its Applications", Tsinghua University, May 2005. (MS Thesis)

Popular press:

Co-Pilot demo (AI for in-car monitoring), in Nvidia Keynote for CES 2017, Jan 2017 https://techcrunch.com/2017/01/04/nvidia-builds-a-co-pilot-into-its-autonomous-drive-computer/

VirtualEye project (multi-camera tracking + free-view video), in Nvidia+DARPA collaboration, June 2016 https://www.engadget.com/2016/06/24/darpas-virtual-eye-lets-soldiers-see-around-obstacles

"**Space-Time Appearance Factorization**", Computer Graphics World, Aug 2006.

PATENTS:

Patent Granted:

P6. Jinwei Gu, Yasunobu Hitomi, Tomoo Mitsunaga, Shree K. Nayar. Methods and systems for coded rolling shutter. US Patent 9100514. 2015/8/4

P5. Wei Jiang and Jinwei Gu. Computational multi-camera adjustment for smooth view switching and zooming. US Patent 9286680. 2016/3/15

P4. Wei Jiang and Jinwei Gu. Parallax tolerant video stitching with spatial-temporal localized warping and seam finding. US Patent 9363449. 2016/6/7

P3. Wojciech Matusik and Jinwei Gu. Using Reflectance Properties. US Patent 9436059. 2016/9/6

P2. Stephen S. Lin, Baining Guo, Heung-Yeung Shum, Jinwei Gu. Radiometric calibration from a single image. US Patent 7986830. 2011/7/26

P1. Jie Zhou, Jinwei Gu and Dingrui Wan. Fingerprint Recognition based on Multiple Features. Chinese Patent CN1595425A 2005/3/16

Patent Application:

A5. Jinwei Gu, Bennett Wilburn, and Wei Jiang. Methods and Systems for Light Field Augmented Reality/Virtual Reality on Mobile Devices. US Patent Application: 20170069133

A4. Wei Jiang and Jinwei Gu. Markerless Multi-User, Multi-Object Augmented Reality on Mobile Devices. US Patent Application: 20170076499.

A3. Jinwei Gu and James Begole. System and Method for Generalized View Morphing Over a Multi-Camera Mesh. US Patent Application: 20160165215

A2. Jinwei Gu and Wei Jiang. A Cost-Effective Hybrid System for Multi-view High-Speed Motion Capture. US Patent Application: 20160140733

A1. Yasunobu Hitomi, Jinwei Gu, Mohit Gupta, Tomoo Mitsunaga, Shree K. Nayar. Systems, methods, and media for reconstructing a space-time volume from a coded image. US Patent Application: 20140192235

FUNDING:

Principal Investigator, RIT Strategic Acceleration of Research for Tenure Track Faculty (START) awards (2012) "Capturing Time-Varying Appearance of Food for Material Perception", $10,000.

Principal Investigator, RIT CIS Micro-grant (2013). Pilot Study on "Seeing the World through a Compound Eye", $6,895.

Co-Investigator, HP Research Grant (2013) "High-Fidelity Softproofing of Surface Appearance", $75,000 (James Ferwerda, PI.)

Co-Investigator, RIT COS Dean's Research Initiation Grant (2013), "3D Computer Vision System for Synthesizing American Sign Language in Avatars", $48,395 (Nathan Cahill, PI.)

Principal Investigator, RIT Office of the Vice President for Research (2011) "Material Categorization with Discriminative Lighting", $5,000.

Co-Investigator, Intel Research Grant (2011) "Color Image Super-resolution", $140,000 (Mark Fairchild, PI.)

STUDENT COLLABORATORS AND ADVISEES:

PhD Students:
Zhaopeng Cui, Computer Science, Simon Fraser (Summer Intern 2016)
Suren Jayasuriya, Computer Science, Cornell Univ. (Summer Intern 2016)
Jian Wang, Computer Science, CMU (Summer Intern 2014)
Dengyu Liu, Imaging Science, RIT (Aug. 2011 - 2013, now Intel)
Chao Liu, Imaging Science, RIT (Sept., 2011 - 2013, now CMU)
Jun Jiang, Color Science, RIT (graduated, May 2013, now Apple)

PROFESSIONAL SERVICE:

Panelist: NSF Robust Intelligence (RI) Program, 2013. NSF CGV Program, 2014.

Organizer: ACCV 2012 Workshop on Computational Photography and Low-level Vision.

Program Committee: CVPR 2013, 2014 Workshop on Computational Camera and Displays, EGSR 2011, IEEE Pro-Cams Workshop 2010, 2011, 2012, SIGGRAPH Asia 2012 Technical Briefs, ICCP 2015, ICCV 2017 PBDL, Associate Editor of Journal of Electronic Imaging.

Peer Reviewer: ACM Transactions on Graphics, IEEE Transactions on Image Processing, IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), International Journal of Computer Vision (IJCV), Journal of the Optical Society of America A (JOSAA), Computer Vision and Image Understanding; SIGGRAPH 2007; SIGGRAPH Asia 2009, 2010; ICCV 2007, 2011, 2013, 2015, 2017; CVPR 2007, 2008,

2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017; Eurographics (EG) 2008, 2009; EGSR 2008, 2009; ICCP 2009, 2010, 2011, 2012. BMVC 2017.

MISCELLANEOUS:

Programming Skills: C++/C (Proficient), Python (Proficient), and Android (Familiar)

Citizenship: People's Republic of China (with Permanent Residency in United States)

Language: Fluent in English, native in Chinese.

REFERENCES:

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Prof. Ko Nishino
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Prof. Stefi Baum (my formal department chair at RIT)
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