Song Zhang

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Education

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- B.S. **University of Science & Technology of China, July 2000**, Anhui, China Bachelor of Science in Manufacturing Automation and Mechatronics Advisor: Professor Fanrang Kong
- M.S. **Stony Brook University, May 2003**, Stony Brook, NY Master of Science in Mechanical Engineering Advisor: Professor Peisen S. Huang
- Ph.D. Stony Brook University, May 2005, Stony Brook, NY Doctor of Philosophy in Mechanical Engineering with minor in Electrical Engineering and Computer Science Thesis title: *High-resolution, real-time 3-D shape measurement*

Thesis advisor: Professor Peisen S. Huang.

Professional Experiences

8/98-6/00	Undergraduate Research Assistant, Precision Machinery and Precision Instrumentation, University
	of Science & Technology of China, Anhui, China
8/00-5/01	Teaching Assistant, Mechanical Engineering, Stony Brook University, Stony Brook, NY
5/01-5/05	Research Assistant, Mechanical Engineering, Stony Brook University
5/05-8/05	Postdoctoral Fellow, Mechanical Engineering, Stony Brook University
	Supervisor: Professor Peisen S. Huang
9/05-6/08	Postdoctoral Fellow, Mathematics, Harvard University, Cambridge, MA
	Supervisor: Professor Shing-Tung Yau (Fields Medalist and National Medal of Science Winner)
	Research Scientist, Geometric Informatics Inc, Somerville, MA.
7/08-8/14	Assistant Professor, Mechanical Engineering, Iowa State University
7/08-12/14	Graduate Faculty, Human Computer Interaction, Iowa State University
7/08-12/14	Affiliate, Virtual Reality Applications Center, Iowa State University
7/09-12/14	Research Associate, Ames Laboratory
7/12-8/14	William and Virginia Binger Assistant Professor of Mechanical Engineering, Iowa State University
1/14-8/14	Assistant Professor of Electrical and Computer Engineering (courtesy), Iowa State University
8/14-12/14	Associate Professor of Mechanical Engineering, and Electrical and Computer Engineering (cour-
	tesy), Iowa State University
1/15-8/19	Associate Professor of Mechanical Engineering, Purdue University, West Lafayette, IN
8/19- pres.	Professor of Mechanical Engineering, Purdue University, West Lafayette, IN
10/19-pres.	Vision Express Optics, CTO, Troy, MI
11/19-pres.	Assistant Head for Experiential Learning, Purdue University, West Lafayette, IN

Honors and Awards

Major recognition

- SIGGRAPH Disney Best Emerging Technology Award, The Walt Disney, 2006
- NSF CAREER Award 2012
- AIAA Outstanding Paper Award, 2013
- 40 under Forty Alumni Award, Stony Brook University, 2014
- CoE Early Career Engineering Faculty Research Award, Iowa State University, 2014
- Fellow, SPIE The International Society for Optics and Photonics, 2014 *Citation: for achievements in high-speed 3D optical metrology, and optical information processing*
- ROBIO 2015 Best Conference Paper Award, IEEE Conference on Robotics and Biomimetics (ROBIO), Zhuhai, China, 2015
- Discovery in Mechanical Engineering Award, School of Mechanical Engineering, Purdue University, 2016 *for seminar work on high accuracy and superfast 3D imaging technique (HAS3DI)*
- Senior Member, Optical Society of America (OSA), 2016
- CoE Early Career Research Excellence Award, Purdue University, 2017
- Seed for Success Award, Purdue University, 2017
- "Innovation of the Year" Finalist, TechPoint Mira awards, 2018 TechPoint Best Tech in Indiana
- Fellow, Optical Society of America (OSA), 2019
- Yuying Educational Scholar, Southeast University, China, 2019
- Seed for Success Award, Purdue University, 2019

Other

- Fellowships at USTC: Graduate with Honor, 2000; Zhenxiong Industrial (special class), 1999; Bao Steel, 1998; Guanghua, 1997; The 9th Zhang Zongzhi Science & Technology, 1996; Excellent Freshman, 1995
- Journal Cover Feature: Applied Optics, Vol. 45, No. 21, 2006
- Journal Cover Feature: Applied Optics, Vol. 47, No. 20, 2008
- Journal Cover Feature: Optical Engineering, Vol. 47, No. 3, 2008
- Journal Cover Feature: Optics Letters, Vol. 35, No. 7, 2010
- Journal Cover Feature: Optics Express, Vol. 18, No. 19, 2010
- Best REU paper (2nd place), the 47th Annual Technical Meeting of Society of Engineering Science, 2010
- Journal Cover Feature: Optics Letters, Vol. 36, No. 23, 2011
- Top 5 most cited papers published in the past five years, Optics and Lasers in Engineering, 2011 *S. Zhang, "Recent progresses on real-time 3-D shape measurement using digital fringe projection techniques,"* Optics and Lasers in Engineering **48**(2), 149–158 (2010)
- Image of the Week: OSA Optics InfoBase, March 21, 2011
- Most cited papers in the past five years, Optics and Lasers in Engineering, 2012
 S. Zhang, "Recent progresses on real-time 3-D shape measurement using digital fringe projection techniques," Optics and Lasers in Engineering 48(2), 149–158 (2010)
- Top 20 most cited papers published in the past five years, Applied Optics, 2012 S. Zhang and S.-T. Yau, "Generic nonsinusoidal phase error correction for three-dimensional shape measurement using a digital video projector," Applied Optics **46**(1), 36–43 (2007)
- Image of the Week: American Journal of Physiology, October 1, 2012
- Journal Cover Feature: Applied Optics Vol. 51, No. 18, 2012
- Named William and Virginia Binger Assistant Professor of Mechanical Engineering, 2012-2014.
- Keynote speaker at ICCES (Crete, Greece), 2012
- Nominated for ISU Award for Early Achievement in Research, 2012

- Top 10 most cited papers published in the past five years, Optics and Lasers in Engineering, 2013 *S. Zhang, "Recent progresses on real-time 3-D shape measurement using digital fringe projection techniques,"* Optics and Lasers in Engineering **48**(2), 149–158 (2010)
- Journal Cover Feature: Optics Express, Vol. 21, No. 5, 2013
- Top 2 most cited papers published in the past five years, Optics and Lasers in Engineering, 2014 *S. Zhang, "Recent progresses on real-time 3-D shape measurement using digital fringe projection techniques,"* Optics and Lasers in Engineering **48**(2), 149–158 (2010)
- Top 20 most cited papers published in the past five years, Optics and Lasers in Engineering, 2014 S. Lei and S. Zhang, "Digital sinusoidal fringe generation: defocusing binary patterns vs focusing sinusoidal patterns," Optics and Lasers in Engineering **48**(5), 561–569 (2010)
- Journal Cover Feature: Applied Optics, Vol. 53, No. 33, 2014
- Image of the Week: OSA Optics InfoBase, November 3, 2014
- Journal Cover Feature: Optics Express, Vol. 22, No. 22, 2014
- Excellence in Reviewing, Optics and Lasers in Engineering, Elsevier, 2014 *in recognition of an outstanding contribution to the quality of the journal*
- Top 10 most cited papers published in the past five years, Optics and Lasers in Engineering, 2015 *S. Zhang, "Recent progresses on real-time 3-D shape measurement using digital fringe projection techniques,"* Optics and Lasers in Engineering **48**(2), 149–158 (2010)
- Journal Cover Feature: Optics Express, Vol. 24, No. 7, 2016
- Image of the Week: OSA Optics InfoBase, April 12, 2016
- Journal Cover Feature: Optics Express, Vol. 25, No. 9, 2017
- Image of the Week: OSA Optics InfoBase, June 12, 2017
- Journal Cover Feature: Optics Express, Vol. 25, No. 22, 2017
- Keynote speaker at Optical Made in China (Shanghai, China), 2018
- Keynote speaker at International Conference on Experimental Mechanics (Brussels, Belgium), 2018
- Journal Cover Feature: Optics Express, Vol. 26, No. 2, 2018
- Journal Cover Feature: Optics Express, Vol. 26, No. 10, 2018
- Faculty Entrepreneurial Learning Academy (ELA) Award (\$7,000), Burton D. Morgan Center for Entrepreneurship, Purdue University, 2019
- Keynote speaker at the 2019 International Conference on Frontiers of Design and Manufacturing (Ann Arbor, Michigan), 2019
- Keynote speaker at the MBL meets OPTIMESS (Antwerp, Belgium) 2019

Honors and Awards by Advisees

- Shuangyan Lei, Miller Fellowship, Iowa State University, Fall 2009
- Nikolaus Karpinsky, HCI graduate student fellowship, Iowa State University, 2009-2010
- William Lohry, Best REU paper (2nd place), the 47th Annual Technical Meeting of Society of Engineering Science, SES, 2010
- Shuangyan Lei, ISU Research Excellence Award, Iowa State University, 2010
- Laura Ekstrand, Deans Fellowship, Iowa State University, 2011
- William Lohry, Selected for 6th Annual Research in the Capital event, Iowa State University, 2011
- Nikolaus Karpinsky, ISU Research Excellence Award, Iowa State University, 2011
- Nikolaus Karpinsky, HCI Student of the Year Award, Iowa State University, 2011
- Beiwen Li, Deans Fellowship, Iowa State University, 2012
- William Lohry and Sam Robinson won the Pappajohn New Venture Business Plan Competition, Pappajohn, 2012

- Nikolaus Karpinsky, NSF Graduate Research Fellowship, NSF, 2012-2015
- Nikolaus Karpinsky, ISU Research Excellence Award, Iowa State University, 2013
- Tyler Bell, Scholarship to attend LAUNCH Mobile & Wearables conference, Iowa State University, 2013
- Yajun Wang, ISU Research Excellence Award, Iowa State University, 2013
- Nikolaus Karpinsky, Boeing Award for the Greatest Number of HCI-Related Journal Publications, Iowa State University, 2013
- Nikolaus Karpinsky, Boeing Award for the Strongest HCI Research Contribution in Journals, Iowa State University, 2013
- Nikolaus Karpinsky, featured on ISU Graduate College website for the month of March, Iowa State University, 2013
- Tyler Bell, HCI graduate student fellowship, Iowa State University, 2013
- Tyler Bell, Best Presentation Award, 1st Graduate and Professional Student Research Conference at ISU, Iowa State University, 2014
- Tyler Bell, ISU Research Excellence Award, Iowa State University, 2014
- Beiwen Li, ASME MSEC Conference Travel Award, ASME, 2015
- Jill Middendorf, NSF Graduate Research Fellowship, NSF, 2015
- Beiwen Li, Ward A. Lambert Graduate Teaching Fellowship, Purdue University, 2016-2017
- Beiwen Li, SPIE Optics and Photonics Education Scholarship, SPIE, 2016-2017
- Ziping Liu, Bottomley Undergraduate Research Scholarship Award, Purdue University, Spring 2017
- Xia Chen, Summer Undergraduate Research Fellowship (SURF), Purdue University, Summer 2017
- Ziping Liu, Perry Fellowship, Purdue University, 2017-2019
- Michael Crawford, Winkelman Fellowship, Purdue University, 2017-2019
- Michael Crawford, Kohr Graduate Fellowship, Purdue University, 2017-2019
- Yatong An, SPIE Optics and Photonics Education Scholarship, SPIE, 2017-2018
- Beatrice Lim, Bottomley Undergraduate Research Scholarship Award, Purdue University, Spring 2018
- Beatrice Lim, Office of Undergraduate Research Scholarship, Purdue University, Spring 2018
- Chufan Jiang, SPIE Optical Design and Engineering Scholarship, SPIE , 2018-2019
- Brian Costa, Bottomley Undergraduate Research Scholarship Award, Purdue University, Spring 2019
- Jae-Sang Hyun, the KSEA/KOSEN Best Poster Award, the Korean-American Scientists and Engineers Association, 2019

Grants and Contracts

Over \$9.50M including \$1M cost share as PI or co-PI, and my personal share is over \$5.00M including \$200k cost share.

- 12/2008-12/2010 ISU ME Departmental Educational Seed Funding, "Incorporating advanced machine vision techniques into ME curricula," Principal Investigator (with Sriram Sundararajan), \$13,400
- 12/2008-12/2009 ISU ME Departmental Research Seed Funding, "Enhancing department and center collaborations using graduate and undergraduate researchers", Co-Principal Investigator (with Baskar Ganapathysubramanian (PI), Shankar Subramaniam, Jim Heise, and Eliot Winer), \$10,000
- 10/2009-9/2012 NIJ, "Manipulative virtual tools for tool mark characterization," Principal Investigator (with L. S. Chumbley and D. Eisenmann), \$360,000
- 10/2009-9/2011 Midwest Forensics Resource Center (MFRC), "Application of face recognition technology to microstamped cartridge cases," Co-Principal Investigator (With L.S. Chumbley (PI)), \$72,000
- 1/2011-12/2013 Deere & Co., "High-resolution, real-time 3-D shape measurement for particle motion capture," Principal Investigator (with E. Winer), \$487,229
- 3/2011-6/2011 ISU Research Foundation (ISURF), "Demonstration system development for hybrid method for 3D shape measurement," Sole Principal Investigator, \$9,728
- 5/2011-8/2011 ISU Honor, "Summer research for Honor student," Principal Investigator, \$1,000
- 6/2012-5/2017 NSF, "CAREER: Dense superfast 3D sensing for extremely rapidly changing mechanical and biological scenes," Sole Principal Investigator, \$400,000 (+ \$22,000 REU Supplement)
- 10/2012-9/2014 NIJ, "Development of a mobile, automated tool mark characterization/comparison system," Co-Principal Investigator (with L.S. Chumbley (PI)), \$499,000
- 5/2013-4/2017 NSF, "High-speed 3D optical metrology of in-situ applications," Sole Principal Investigator, \$199,972 (+ \$5,000 REU Supplement)
- 7/2013-12/2013 US Army Crime Investigation Laboratory (USACIL), "Pilot study on capturing live 3D human facial expressions," Sole Principal Investigator, \$50,000
- 1/2014-12/2016 Deere & Co., "Portable high-speed, multi-camera 3-D sensing and imaging for harsh agricultural applications," Principal Investigator (with E. Winer), \$366,553
- 1/2014-6/2014 Institute for Physical Research and Technology (IPRT), "Demonstrate structured light based object tracking and image projection for the NDE environment," Principal Investigator (with Steve Holland), \$20,000
- 6/2014-12/2014 Micro-Vu Corporation, "High-accuracy 3D optical metrology with binary defocusing methods", Sole Principal Investigator, \$77,518 (+\$15,000 license option)
- 1/2015-5/2016 Micro-Vu Corporation, "High-accuracy 3D optical metrology with binary defocusing methods: Phase II," Sole Principal Investigator, \$144,010
- 1/2015-12/2016 Deere & Co., subcontract from Iowa State University, "Portable high-speed, multi-camera 3-D sensing and imaging for harsh agricultural applications," Sole Principal Investigator, \$111,897
- 9/2016-8/2019 National Science Foundation (NSF), "NRI: Towards dexterous micromanipulation and assembly," Co-Principal Investigator (with David Cappelleri (PI) and Karthik Ramani), \$1,000,000
- 3/2016-9/2017 Digital Manufacturing and Design Innovation Institute (DMDII), subcontract from Iowa State University, "Authoring augmented reality work instruction by expert demonstration," Sole Principal Investigator from Purdue University, \$2,000,000 (\$400,000 Purdue share including 50% cost share)
- 1/2017-12/2019 National Institute of Justice (NIJ), "Development of a portable 3D imaging system for capturing shoe and tire impressions," Sole Principal Investigator, \$788,167
- 9/2018-8/2022 National Science Foundation (NSF), "RI: Medium: Light Responsive Polymer Magnetic Microrobots with Dual Mode Sensing for Biomedical and Advanced Manufacturing Applications," Co-Principal Investigator, with David Cappelleri (PI), \$1,000,000

- 5/2019-10/2019 Deere & Co., "High-resolution large range 3D scanning system: 3D Soil Profiler," Sole Principal Investigator, \$20,000
- 9/2019-8/2020 National Science Foundation (NSF), "Convergence Accelerator Phase I (RAISE): Skill-LeARn: Affordable Augmented Reality Platform for Scaling Up Manufacturing Workforce, Skilling, and Education," Co-Principal Investigator, with Karthik Ramani (PI), David Ebert, Kylie Peppler, and Thomas Redick \$1,000,000
- 1/2020-12/2021 National Institute of Justice (NIJ), "Development of dual-resolution 3D imaging device and software tools for shoe and tire impression evidence collection, visualization, and recognition," Sole Principal Investigator, \$823,804
- 10/2019-9/2020 Deere & Co., "Camera Implement Hookup Detection," Sole Principal Investigator, \$126,737

Research Interests

High-speed 3-D optical sensing/metrology, 3-D biophotonic imaging, 3-D video compression, 3D video telepresence, virtual/augmented reality, human computer interaction, forensic science, and biometrics.

Publications

Books	2
Book chapters	7
Edited conference proceedings or special issues	10
Journal papers (published or accepted)	119
Conference papers	83
Conference abstracts	37
Patents and applications	8 (4 awarded)
Journal papers featured on cover	15
Journal papers highlighted as "Image of The Week"	5
Scopus citations	Total: 6,388, H-index: 39
Google Scholar citations	Total 8,937, H-index: 45

Table 1: Data on the table were extracted on October 5, 2019

Cited by		VIEW ALL								1400
	All	Since 2014				÷.	t	t	L	1050
						11				700
Citations	8937	6109			I.					350
h-index	45	38								550
i10-index	112	102	2012 2013	2014	2015	2016	2017	2018	2019	0

Figure 1: Data were extracted from Google Scholar on October 5, 2019

^G: denotes advised graduate students; ^{UG}: denotes advised undergraduate students

Books

- 1. S. Zhang (editor), *Handbook of 3-D machine vision: Optical metrology and imaging.* CRC Press, Taylor & Francis Group LLC. ISBN: 978-1-4398-7219-2. (2013).
- 2. S. Zhang, *High-speed 3D imaging with digital fringe projection techniques: Principle and practices.* CRC Press, Taylor & Francis Group LLC. ISBN: 978-1-4822-3433-6 (2016).

Book Chapters

- 1. S. Zhang, *High-resolution, high-speed 3D dynamically deformable shape measurement using digital fringe projection techniques*, ch. 2, 29–50. Advances in Measurement Systems, Milind Kr Sharm (Editor), In-tech, Vukovar, Croatia (2010). (invited).
- 2. S. Zhang and Y. Gong^G, *High-speed, high-resolution 3-D imaging using projector defocusing*, ch. 7, 121–140. Depth Map and 3D Imaging Applications: Algorithms and Technologies, Aamir Saeed Malik and Tae-Sun Choi and Humaira Nisar (Editors) IGI Global, Hershey, PA (2011). (invited).

- N. Karpinsky^G and S. Zhang, *3-D geometry compression using Holoimage*, ch. 5, 87–104. Depth Map and 3D Imaging Applications: Algorithms and Technologies, Aamir Saeed Malik and Tae-Sun Choi and Humaira Nisar (Editors) IGI Global, Hershey, PA (2011). (invited).
- 4. Y. Wang^G, B. Li^G, and S. Zhang, *Three-dimensional shape measurement with binary dithering techniques*. ch. 2, 43–60. Recent Advances in Topography Research, Jan Buytaert (Editor), Nova Science Publishers, Hauppauge, NY (2013). (invited).
- L. Ekstrand^G, Y. Wang^G, N. Karpinsky^G, and S. Zhang, *Superfast 3D profilometry with digital fringe projection* and phase-shifting techniques, ch. 9, 233–251. Handbook of 3D machine vision: Optical metrology and imaging, Song Zhang (Editor), CRC Press, Taylor & Francis Group LLC, Boca Raton, FL (2013). (invited).
- T. Bell^G, N. Karpinsky^G, and S. Zhang, *High-resolution, real-time 3D sensing with structured light techniques.* ch. 5, 181–213. Interactive Displays: Natural Human-Interface Technologies, Achintya K. Bhowmik (Editor), John Wiley & Sons, Hoboken, NJ (2014). (invited).
- 7. T. Bell^G, B. Li^G, and S. Zhang, *Structured light techniques and applications*, 1–24. Wiley Encyclopedia of Electrical and Electronics Engineering, Wiley-Interscience, Hoboken, NJ (2016). (invited).

Special Issues of Journals and Conference Proceedings Edited

- 1. S. Zhang, R. Liang, and L. Yang (Guest Editors), *Special Section on High-Speed 3-D Optical Metrology and Applications, Opt. Eng.* **53**(11), (2014).
- 2. S. Han, T. Yoshizawa, and S. Zhang (Editors), *Optical Metrology and Inspection for Industrial Applications III, SPIE Proc.* Vol. 9276, (2014).
- 3. S. Han, T. Yoshizawa, and S. Zhang (Editors), *Optical Metrology and Inspection for Industrial Applications IV, SPIE Proc.* Vol. 10023, (2016).
- 4. K. Harding and S. Zhang (Editors), *Dimensional Optical Metrology and Inspection for Practical Applications V, SPIE Proc.* Vol. 9868, (2016).
- 5. K. Harding and S. Zhang (Editors), *Dimensional Optical Metrology and Inspection for Practical Applications VI, SPIE Proc.* Vol. 10220, (2017).
- 6. X. Chen, M. Grossard, N. Kubota, D. Wollherr, S. X. Yang, and S. Zhang (Guest Editors), *Focused Section on Sensing and Perception for Autonomous and Networked Rotobics, Int. J. Intell. Robot. Applic.* 1(4), (2017).
- 7. K. Harding and S. Zhang (Editors), *Dimensional Optical Metrology and Inspection for Practical Applications VII, SPIE Proc.* Vol. 10667, (2018).
- 8. X. Chen, S. Zhang, and J. M. Geraedts (Guest Editors), *Guest editorial focused section on sensing and perception systems for intelligent manufacturing (SPIM), IEEE/ASME Transaction on Mechatronics* 23(3), (2018).
- 9. S. Han, T. Yoshizawa, and S. Zhang (Editors), *Optical Metrology and Inspection for Industrial Applications V, SPIE Proc.* Vol. 10819, (2018).
- 10. K. Harding and S. Zhang (Editors), *Dimensional Optical Metrology and Inspection for Practical Applications VIII, SPIE Proc.* Vol. 10991, (2019).

Journal Papers

- Y. Wang, X. Huang, C.-S. Lee, S. Zhang, Z. Li, D. Samaras, D. Metaxas, A. Elgammal, and P. Huang, "High-resolution acquisition, learning and transfer dynamic 3D facial expression," *Computer Graphics Forum* 23(3), 677 686 (2004).
- 2. P. S. Huang, S. Zhang, and F.-P. Chiang, "Trapezoidal phase-shifting method for three-dimensional shape measurement," *Optical Engineering* **44**(12), 123601 (2005).
- 3. S. Zhang and P. S. Huang, "Novel method for structured light system calibration," *Optical Engineering* **45**(8), 083601 (2006).
- 4. S. Zhang and S.-T. Yau, "High-resolution, real-time 3-D absolute coordinate measurement based on a phase-shifting method," *Optics Express* **14**(7), 2644–2649 (2006).

- 5. P. S. Huang and S. Zhang, "Fast three-step phase-shifting algorithm," *Applied Optics* **45**(21), 5086–5091 (2006). (*Cover feature*).
- 6. S. Zhang and P. S. Huang, "High-resolution real-time three-dimensional shape measurement," *Optical Engineering* **45**(12), 123601 (2006).
- S. Zhang, D. Royer, and S.-T. Yau, "Gpu-assisted high-resolution, real-time 3-D shape measurement," *Optics Express* 14(20), 9120–9129 (2006). (Selected for November 13, 2006 issue of The *Virtual Journal for Biomedical Optics*).
- 8. S. Zhang and S.-T. Yau, "High-speed three-dimensional shape measurement system using a modified twoplus-one phase-shifting algorithm," *Optical Engineering* **46**(11), 113603 (2007).
- 9. S. Zhang and P. S. Huang, "Phase error compensation for a three-dimensional shape measurement system based on the phase shifting method," *Optical Engineering* **46**(6), 063601 (2007).
- 10. S. Zhang and S.-T. Yau, "Generic nonsinusoidal phase error correction for three-dimensional shape measurement using a digital video projector," *Applied Optics* **46**(1), 36–43 (2007).
- 11. S. Zhang, X. Li, and S.-T. Yau, "Multilevel quality-guided phase unwrapping algorithm for real-time threedimensional shape reconstruction," *Applied Optics* **46**(1), 50–57 (2007). (Selected for February 5, 2007 issue of The *Virtual Journal for Biomedical Optics*).
- 12. S. Zhang and S.-T. Yau, "Simultaneous three-dimensional geometry and color texture acquisition using single color camera," *Optical Engineering* **47**(12), 123604 (2008).
- 13. S. Zhang and S.-T. Yau, "Absolute phase assisted three-dimensional data registration for a dual-camera structured light system," *Applied Optics* **47**(17), 3134–3142 (2008). (*Cover feature*).
- 14. S. Zhang and S.-T. Yau, "Three-dimensional data merging using holoimage," *Optical Engineering* **47**(3), 033608 (2008). (*Cover feature*).
- 15. R. P. Mehta, S. Zhang, and T. A. Hadlock, "Novel 3-D video for quantification of facial movement," *Otolaryn*gology - Head Neck Surgery **138**(4), 468–472 (2008).
- Y. Wang, M. Gupta, S. Zhang, S. Wang, X. Gu, D. Samaras, and P. Huang, "High resolution tracking of non-rigid 3D motion of densely sampled data using harmonic maps," *International Journal Computer Vision* 76(3), 283–300 (2008).
- 17. S. Zhang and S.-T. Yau, "Three-dimensional shape measurement using a structured light system with dual cameras," *Optical Engineering* **47**(1), 013604 (2008).
- 18. S. Lei^G and S. Zhang, "Flexible three-dimensional shape measurement using projector defocusing," *Optics Letters* **34**(20), 3080–3082 (2009).
- 19. S. Zhang, "Phase unwrapping error reduction framework for a multiple-wavelength phase-shifting algorithm," *Optical Engineering* **48**(10), 105601 (2009).
- 20. S. Zhang and S.-T. Yau, "High dynamic range scanning technique," Opt. Eng. 48(3), 033604 (2009).
- 21. Y. Wang^G and S. Zhang, "Optimal pulse width modulation for sinusoidal fringe generation with projector defocusing," *Optics Letters* **35**(24), 4121–4123 (2010).
- 22. Y. Gong^G and S. Zhang, "Ultrafast 3-D shape measurement with an off-the-shelf dlp projector," *Optics Express* **18**(19), 19743–19754 (2010). (*Cover feature*).
- S. Zhang, D. van der Weide, and J. Oliver, "Superfast phase-shifting method for 3-D shape measurement," *Optics Express* 18(9), 9684–9689 (2010). (Selected for July 6, 2010 issue of The *Virtual Journal for Biomedical Optics*).
- 24. N. Karpinsky^G and S. Zhang, "Composite phase-shifting algorithm for three-dimensional shape compression," *Optical Engineering* **49**(6), 063604 (2010).
- 25. S. Zhang, "Flexible three-dimensional shape measurement using projector defocusing: Extended measurement range," *Optics Letters* **35**(7), 931–933 (2010). (*Cover feature*).
- 26. S. Lei^G and S. Zhang, "Digital sinusoidal fringe generation: defocusing binary patterns vs focusing sinusoidal patterns," *Optics and Lasers in Engineering* **48**(5), 561–569 (2010).

- 27. S. Zhang, "Recent progresses on real-time 3-D shape measurement using digital fringe projection techniques," *Optics and Lasers in Engineering* **48**(2), 149–158 (2010).
- 28. L. Ekstrand^G and S. Zhang, "Auto-exposure for three-dimensional shape measurement with a digital-light-processing projector," *Optical Engineering* **50**(12), 123603 (2011).
- 29. L. Ekstrand^G and S. Zhang, "Three-dimensional profilometry with nearly focused binary phase-shifting algorithms," *Optics Letters* **36**(23), 4518–4520 (2011). (*Cover Feature*).
- 30. Y. Xu^{UG}, L. Ekstrand^G, J. Dai, and S. Zhang, "Phase error compensation for three-dimensional shape measurement with projector defocusing," *Applied Optics* **50**(17), 2572–2581 (2011).
- 31. Y. Wang^G, S. Zhang, and J. H. Oliver, "3-D shape measurement technique for multiple rapidly moving objects," *Optics Express* **19**(9), 5149–5155 (2011).
- 32. S. Zhang, "High-resolution three-dimensional profilometry with binary phase-shifting methods," *Applied Optics* **50**(12), 1753–1757 (2011).
- Y. Wang^G and S. Zhang, "Superfast multifrequency phase-shifting technique with optimal pulse width modulation," *Optics Express* 19(6), 5143–5148 (2011). (*Image of the week, OSA Optics InfoBase, March 21, 2011*).
- 34. Y. Wang^G and S. Zhang, "Optimal pulse width modulation for sinusoidal fringe generation with projector defocusing: Reply to comments," *Optics Letters* **36**(6), 809 (2011).
- 35. Y. Gong^G and S. Zhang, "High-speed, high-resolution three-dimensional shape measurement using projector defocusing," *Optical Engineering* **50**(2), 023603 (2011).
- 36. W. Lohry^{UG} and S. Zhang, "Fourier transform profilometry using a binary area modulation technique," *Optical Engineering* **51**(11), 113602 (2012).
- 37. Y. Wang^G and S. Zhang, "Three-dimensional shape measurement with binary dithered patterns," *Applied Optics* **51**(27), 6631-6636 (2012).
- 38. S. Zhang, "Composite phase-shifting algorithm for absolute phase measurement," *Optics and Lasers in Engineering* **50**(11), 1538-1541 (2012).
- J. I. Laughner, S. Zhang, H. Li, C. C. Shao, and I. R. Efimov, "Mapping cardiac surface mechanics with structured light imaging," *American Journal of Physiology: Heart and Circulatory Physiology*. 303(6), H712-H720 (2012). (*Image of the Week, American Journal of Physiology, October 1, 2012*).
- 40. S. Zhang, "Three-dimensional range data compression using computer graphics rendering pipeline," *Applied Optics* **51**(18), 4058-4064 (2012). (*Cover Feature*).
- 41. Y. Wang^G and S. Zhang, "Novel phase coding method for absolute phase retrieval," *Optics Letters* **37**(11), 2067-2069 (2012).
- 42. W. Lohry^{UG} and S. Zhang, "3D shape measurement with 2D area modulated binary patterns," *Optics and Lasers Engineering* **50**(7), 917-921 (2012).
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- 51. C. Gong^{UG}, B. Li^G, and S. Zhang, "Comparing digital-light-processing (dlp) and liquid-crystal-display (lcd) technologies for high-quality 3D shape measurement," in *Proc. SPIE*, **9276**, 92760Q, *SPIE/COS Photonics Asia* (Beijing, China) (2014). (invited).

- 52. J. Dai and S. Zhang, "Binary dithered pattern optimization strategies for high-quality phase generation," in *Proc. SPIE*, **9276**, 92760C, *SPIE/COS Photonics Asia* (Beijing, China) (2014). (invited).
- 53. B. Li^G, P. Ou, and S. Zhang, "High-speed 3D shape measurement with fiber interference," in *Proc. SPIE*, **9203**, 920310, *SPIE Optics and Photonics* (San Diego, California) (2014). (invited).
- 54. L. Ekstrand^G and S. Zhang, "Automated high-dynamic range three-dimensional optical metrology technique," in *ASME 2014 International Manufacturing Science and Engineering Conference*, (Detroit, Michigan) (2014).
- 55. S. Zhang, "Active vs passive projector nonlinear gamma compensation method for high-quality fringe pattern generation," in *Proc. SPIE*, **927602**, 927602, *SPIE Sensing Technology* + *Applications* (Baltimore, Maryland) (2014). (invited).
- 56. C. Gong^{UG}, B. Li^G, K. G. Harding, and S. Zhang, "Comparing digital-light-processing (dlp) and liquid-crystalon-silicon (lcos) technologies for high-quality 3D shape measurement," in *Proc. SPIE*, **9276**, 92760Q, *SPIE Sensing Technology* + *Applications* (Baltimore, Maryland) (2014).
- 57. T. Bell^G and S. Zhang, "Towards superfast 3D optical metrology with digital micromirror device (DMD) platforms," in *Proc. SPIE*, **8979**, 897907, *IS&T/SPIE Electronics Imaging* (San Francisco, California) (2014).
- 58. J. Dai and S. Zhang, "Zero-phase locking for phase-shifted dithering technique," in *Proc. SPIE*, **9524**, 95240J, *International Conference on Optical and Photonic Engineering (icOPEN 2015)* (Singapore, Singapore) (2015).
- 59. S. Zhang, "3D range data compression with a virtual fringe projection system," in *Proc. SPIE*, **9489**, 948902, *SPIE Sensing Technology* + *Application* (Baltimore, Maryland) (2015).
- 60. A. Wan, J. Xu, S. Zhang, Z. Zhang, and K. Chen, "Learning optimal measurement and control of assembly robot for large-scale heavy-weight parts," in 2015 IEEE Conference on Robotics and Biomimetics (ROBIO), (Zhuhai, China) (2015). (Best Conference Paper).
- 61. S. Fang, F. Zhu, C. Jiang^G, S. Zhang, C. Boushey, and E. Delp, "A comparison of food portion size estimation using geometric models and depth images," *IEEE International Conference on Image Processing (ICIP)*, (Phoenix, Arizona) (2016).
- 62. B. Li^G, Z. Liu^{UG}, and S. Zhang, "Motion artifact reduction using hybrid fourier transform with phase-shifting methods," in *Proc. SPIE*, **9960**, 99600K, *SPIE Optics and Photonics*, (San Diego, California) (2016).
- 63. B. Li^G and S. Zhang, "High-resolution, real-time to superfast 3D imaging techniques," *IEEE International Conference on Advanced Intelligent Mechatronics (AIM)*, (Banff, Canada) (2016). (invited).
- 64. Z. Zhu^{UG} and S. Zhang, "Structured light system design consideration," *International Conference on Experimental Mechanics*, (Rhodes, Greece) (2016).
- 65. M.-C. Lin^G, C.-H. Tien, and S. Zhang, "High-accuracy structured light system calibration using circle patterns," *International Conference on Experimental Mechanics*, (Rhodes, Greece) (2016).
- 66. S. Zhang, "Supefast 3D imaging technique and its applications," *International Conference on Processes in Combined Digital Optical and Imaging Methods applied to Mechanical Engineering*, (Ascona, Switzerland) (2016). (invited).
- 67. T. Bell^G and S. Zhang, "A comparative study on 3D range data compression methods," in *Proc. SPIE*, **9868**, 986803, *SPIE Defense and Commercial Sensing* (Baltimore, MD) (2016).
- 68. C. Jiang^G and S. Zhang, "High-contrast 3D surface measurement without changing camera exposures," in *Proc. SPIE*, **9868**, 98680E, *SPIE Defense and Commercial Sensing* (Baltimore, MD) (2016).
- 69. S. Zhang, J.-Hyun^G, and B. Li^G, "High-speed 3D imaging using digital binary defocusing method vs sinusoidal method," in *Proc. SPIE*, **10117**, 1011707, *SPIE Photonics West*, (San Francisco, California) (2017). (invited).
- 70. J. Hyun^G and S. Zhang, "High-speed 3D surface measurement with mechanical projector," *Proc. SPIE*, **10220**, 1022004, *SPIE Commercial + Scientific Sensing and Imaging*, (Anaheim, California) (2017).
- 71. Y. An^G and S. Zhang, "High-speed, high-accuracy large range 3D shape measurement," *Proc. SPIE*, **10220**, 1022005, *SPIE Commercial + Scientific Sensing and Imaging*, (Anaheim, California) (2017).

- 72. C. Jiang^G and S. Zhang, "Absolute phase unwrapping for dual camera without embedding statistical features," *Proc. SPIE*, **10220**, 1022009, *SPIE Commercial + Scientific Sensing and Imaging*, (Anaheim, California) (2017).
- 73. T. Bell^G, J. Allebach, and S. Zhang, "Holostream: High-accuracy, high-speed 3d range video," *IS&T International Conference on Electronic Imaging*, (Burlingame, California) (2018).
- 74. Z. Liu^G and S. Zhang, "Motion-induced error compensation for 3D shape measurement with phase shifting technique," in *Proc. SPIE*, **10667**, 1066707, *SPIE Commercial* + *Scientific Sensing and Imaging*, (Orlando, Florida) (2018).
- 75. Y. Wang and S. Zhang, "High-accuracy, real-time 3d shape measurement with double-pattern pulse width modulation techniques," in *Proc. SPIE*, **10667**, 1066709, *SPIE Commercial + Scientific Sensing and Imaging*, (Orlando, Florida) (2018).
- 76. S. Zhang, "Recent research on high-resolution 3d range geometry compression," in *Proc. SPIE*, **10667**, 106670C, *SPIE Commercial + Scientific Sensing and Imaging*, (Orlando, Florida) (2018). (invited).
- 77. S. Zhang, "High-accuracy, high-speed 3d shape measurement techniques," in *International Conference on Experimental Mechanics*, (Brussels, Belgium) (2018). (keynote).
- 78. T. Bell^G and S. Zhang, "High-resolution 3d optical sensing and real-time 3d video data streaming," in *Proc.* of 2018 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), (Auckland, New Zealand) (2018). (invited).
- 79. T. Bell^G and S. Zhang, "HoloReality: Real-time, row-bandwidth 3d range video communications on consumer mobile devices with application to augmented reality," *IS&T International Conference on Electronic Imaging*, (Burlingame, California) (2019).
- 80. Y. Wang, B. Li, and S. Zhang, "Motion induced error compensation method for digital fringe projection system," in *Proc. SPIE, SPIE Photonics West* **10932**, 109320F, (San Francisco, California) (2019).
- 81. J.-S. Hyun^G, M. G. Carmichael, A. Tran, S. Zhang, and D. Liu, "Evaluation of fast, high-detail project3ed light 3d sensing for robots in construction," *IEEE 6th International Conference on Industrial Engineering and Applications*, (Xi'an, China) (2019).
- 82. J.-S. Hyun^G and S. Zhang, "High-speed 3d imaging with three binary patterns using Hilbert transform," in *Proc. SPIE, SPIE Optics and Photonics*, (San Diego, California) (2019).
- 83. J.-S. Hyun^G and S. Zhang, "Phase-based stereo matching for high-accuracy three-dimensional optical sensing," in *Frontiers in Optics* + *Laser Science APS/DLS*, FW6F.2 (2019).

Conference Abstracts

- 1. S. Lei^G, N. Karpinsky^G, and S. Zhang, "High-resolution, real-time 3D scanning and its industrial applications," *SIAM Mathematics for Industry*, (San Francisco, CA) (2009). (invited).
- 2. N. Karpinsky ^G and S. Zhang, "High-resolution, real-time acquisition of 3D dynamic shapes," *ASME World Conference on Innovative Virtual Reality (WinVR)*, (Ames, IA) (2010). (poster).
- 3. L. S. Chumbley, D. J. Eisenmann, M. Morris, S. Zhang, J. Kreiser, J. Craft, and C. Fisher, "Quantifications of toolmarks," *NIJ Pattern and Impression Evidence Symposium*, (Clearwater Beach, FL) (2010).
- 4. Y. Gong^G, Y. Wang^G, and S. Zhang, "High-speed, high-resolution 3-D imaging for biomedical applications," in *One Health Symposium: People, Plants & Animals*, (Ames, IA) (2010). (poster).
- B. Wang, W. Lohry^{UG}, S. Zhang, and H. Hu, "Quantification of the transient behavior of wind-driven water droplets and rivulet flows on a substrate," in 63rd Annual Meeting of the American Physical Society's Division of Fluid Dynamics (DFD), (Long Beach, CA) (2010).
- 6. W. Lohry^{UG} and S. Zhang, "Realtime surface capture using multiple wavelength fringe projection," in *The 6th annual Research in the Capital*, (Des Moines, IA) (2011). (Poster).
- T. Grieve, L. S. Chumbley, D. J. Eisenmann, M. Morris, S. Zhang, J. Kreiser, T. Lizotte, and O. Ohar, "Microstamped identifiers: Evaluation and analysis," in *MFRC Annual Meeting*, (St. Louis, Missouri) (2011). (abstract).

- S. Zhang, L. S. Chumbley, M. Morris, B. W. King, A. B. Hoeksema, T. Grieve, Y. Gong^G, V. Villagomez^{UG}, D. J. Eisenmann, and J. Kreiser, "Virtual manipulative tools for tool mark characterization," in *AFTE 2011 Training Seminar Program*, (Chicago, IL) (2011).
- L. Ekstrand^G, S. Zhang, L. S. Chumbley, T. Grieve, E. Villagomez^{UG}, D. J. Eisenmann, M. Morris, and J. Kreiser, "Recent study on virtual manipulative tools for tool mark characterization," in *39th Annual Sympo*sium Communication in a Laboratory Setting, (Denver, Colorado) (2011). (poster).
- T. Grieve, L. S. Chumbley, D. J. Eisenmann, M. Morris, S. Zhang, and J. Kreiser, "Microstamped identifiers: Evaluation and analysis," in *39th Annual Symposium Communication in a Laboratory Setting*, (Denver, Colorado) (2011). (poster).
- 11. B. Wang, Z. Jin, A. Rothmayer, S. Zhang, and H. Hu, "Quantification of the unsteady heat transfer and phase changing process within micro-sized icing water droplets," in *ASME IMECE*, (Denver, Colorado) (2011). (poster).
- 12. J. I. Laughner, C. Gloschat, S. Zhang, and I. R. Efimov, "A method for measuring 3D cardiac surface mechanics with high-speed structured light imaging," in *Experimental Biology*, (San Diego, California) (2012).
- 13. J. I. Laughner, H. Li, S. Zhang, and I. R. Efimov, "A markerless method for measuring cardiac surface mechanics using ultrafast 3D imaging," in *International Symposium on Biomedical Imaging*, (Barcelona, Spain) (2012).
- 14. S. Zhang, "kHz 3D imaging with binary phase-shifting techniques," in *International Conference on Computational & Experimental Engineering and Sciences (ICCES)*, (Crete, Greece) (2012).
- 15. S. Zhang, "kHz 3D optical imaging using the binary defocusing technique," in *3D Geometry/Imaging Conference*, (Yunan, China) (2012). (Invited).
- 16. Y. Wang^G, W. F. Lohry^{UG}, B. R. Halls, T. R. Meyer, and S. Zhang, "Superfast micro-scale 3D optical profilometry using digital binary defocusing techniques," in *ASME International Mechanical Engineering Congress and Exposition, ASME Society-Wide Micro & Nano Technology Forum*, (Houston, TX) (2012). (Poster).
- 17. T. N. Grieve, L. S. Chumbley, J. Kreiser, M. D. Morris, and S. Zhang. L. D. Ekstrand^G, "Comparison of striated marks from slip joint pliers," in *American Academy of Forensic Sciences*, (Washington, DC) (2013).
- 18. L. Ekstrand^G, S. Zhang, L. S. Chumbley, T. Grieve, and D. J. Eisenmann, "Virtual tool mark generation for efficient tool mark analysis," in *American Academy of Forensic Sciences*, (Washington, DC) (2013).
- 19. R. Spotts, L. Ekstrand^G, S. Zhang, and S. Chumbley, "Blind study comparison of virtual marks to tool marks," in *AFTE 2014 Training Seminar Program*, (Seattle, WA) (2014).
- 20. S. Zhang, "High-resolution, high-speed 3D optical sensing," in *EITC-2015: Advancing Technology Innovations through Collaborations*, (Cambridge, MA) (2015). (invited).
- 21. B. Li^G and S. Zhang, "Structured light system calibration with optimal fringe angle," in *ASME Manufacturing Science and Engineering Conference*, (Charlotte, NC) (2015). (poster).
- 22. S. Zhang, "High-speed 3D optical sensing for in-situ quality assurance," in *Finding Pathways from NSF-Funded Basic Research to DOE-Funded Applied Research on Additive Manufacturing*, (Oak Ridge, TN) (2015). (invited).
- 23. S. Zhang, "High-resolution, high-speed 3D optical sensing and its applications," in *3rd Annual International Educational Conference: The Science of Measurement*, (Orlando, FL) (2016).
- 24. L. S. Chumbley and S. Zhang, "MANTIS: Portable prototype system for toolmark research," in *The Association of Firearm and Tool Mark Examiners (AFTE) Annual Training Seminar*, (New Orleans, LA) (2016).
- 25. B. Li and S. Zhang, "3D dynamic strain measurement of inextensible thin membrane using structure light 3D imaging and geodesic computation," in *Engineering Mechanics Institute Conference (EMI 17)*, (San Diego, CA) (2017).
- 26. S. Zhang, D. Baldwin, and J. Wolfe, "Workshop on 3D footwear and tire tread impression capture," *Impression, Pattern and Trace Evidence Symposium (IPTES)*, (Arlington, Virginia) (2018).
- 27. S. Zhang, "Superfast 3d optical metrology techniques and applications," *Optical Made in China*, (Shanghai, China) (2018). (keynote).

- 28. S. Zhang, "Superfast 3d imaging techniques and applications," *Workshop on Geometry, Imaging, and Computing, Harvard University*, (Cambridge, MA) (2018). (invited).
- 29. S. Zhang, "High-speed 3d shape measurement techniques and applications," in *International Conference on Optical and Photonic Engineering (icOPEN 2018)*, (Shanghai, China) (2018). (invited).
- 30. S. Zhang and D. Baldwin, "Workshop on 3d footwear and tire tread impression capture," *The IAI's 103rd International Forensic Educational Conference*, (San Antonio, Texas) (2018).
- 31. S. Zhang, "Recent progress on high-speed 3d shape measurement with structured-light methods," *SPIE Photonics Asia*, (Beijing, China) (2018). (invited).
- 32. S. Zhang and D. Baldwin, "Portable high-resolution automated 3d scanning system," in *IAFSM 5th Annual International Educational Conference*, (Fort Worth, TX) (2018).
- 33. C. Jiang^G and S. Zhang, "Development of a portable 3d scanning system for capturing shoe and tire impressions," in *IS&T International Symposium on Electronic Imaging*, (Burlingame, CA) (2019).
- 34. S. Zhang, "3d video compression and streaming," in *International Forum on Computational Optical Measurement and its Education*, (Nanjing, China) (2019). (invited).
- 35. S. Zhang, "Comparing hilbert transform profilometry and fourier transform profilometry," in *SPIE Defense* and Commerical Sensing, (Baltimore, MD) (2019).
- S. Zhang, "High-speed, high-resolution 3d optical sensing and information processing for smart manufacturing," in *The 2019 International Conference on Frontiers of Design and Manufacturing*, (Ann Arbor, MI) (2019). (keynote).
- 37. S. Zhang, "High-speed 3d shape measurement and applications," in *MBL meets OPTIMESS*, (Antwerp, Belgium) (2019). (keynote).

Technical reports

- 1. K. Byron^{UG}, L. Pham^{UG}, J. Situka^{UG}, K. Kopecky, and S. Zhang, "Markerless motion tracking," HCI summer REU 09, Iowa State University, Ames, IA (2009).
- 2. S. Zhang and L. S. Chumbley, "Manipulative virtual tools for tool mark characterization," final technical report (document no. 241443), National Institute of Justice (NIJ), Washington D.C., MD (2012).
- 3. E. Winer, S. Zhang, B. Bhattacharya, Y. Wang^G, N. Karpinsky^G, W. Lohry^G, W. El-Ratal, P. Kosmicki, J. Pirillo, E. Kuczmarski, and M. Ryken, "High-resolution, real-time 3D shape measurement for particle motion capture," final technical report, Deere and Co., Waterloo, IA (2014).
- L. S. Chumbley, S. Zhang, and M. Morris, "Development of a mobile, automated tool mark characterization/comparison system," final technical report (document no. 250569), National Institute of Justice (NIJ), Washington D.C., MD (2017).

Patents

- 1. S. Zhang, Y. Wang^G, and W. F. Lohry^{UG}, "3D shape measurement using dithering," US patent No. 8,929,644
- 2. S.-T. Yau, S. Zhang, and X. Gu, "Simultaneous geometry and color texture acquisition using a single-chip color camera," US patent No. 8,861,833
- 3. S. Zhang, S.-T. Yau, X. Gu, Y. Wang, and D. Royer, "Method and apparatus for absolute-coordinate threedimensional surface measurement," US patent No. 7,929,751
- 4. S. Zhang and B. Li^G, "Calibration arrangement for structured light system using a tele-centric lens," US patent No. 10,412,365
- 5. S. Zhang and T. Bell^G, "Method and system for multi-wavelength depth encoding for three-dimensional range geometry compression," Pending U.S. Patent Application, USSN 15/367,221 (Filed on December 02, 2016)
- 6. S. Zhang and T. Bell^G, "System architecture and method of processing data therein," Pending U.S. Patent Application, USSN 16/363,254 (Filed on March 25, 2019)
- 7. D. Cappelleri, S. Zhang, and M. G. Noguera, "Light responsive polymer magnetic microrobots," Pending U.S. Patent Application, USSN 16/034,401 (Filed on July 13, 2018)

8. S. Zhang, "Rapid and automatic optimal exposure determination for digital fringe projection profilometry," Provisional Patent 62/853,553 (Filed on May 28, 2019)

Invited Talks

- "High-resolution, Real-time Geometry Video Acquisition," Sony Computer Entertainment America, San Diego, CA, Sep. 7, 2006
- 2. "High-resolution, Real-time Geometry Video Acquisition," Massachusetts Eye and Ear Hospital, Mass General Hospital (MGH), Harvard Medical School, Boston, MA, 2006
- "High-resolution, Real-time Geometry Video Acquisition," Biomedical Engineering Department (Prof. Igor Efimov's lab), Washington University in St. Louis, St. Louis, MO, Feb. 27, 2007
- "High-resolution, Real-time Geometry Video Acquisition," (informal), University of California-Irvine, CA, Feb. 25, 2007
- "High-resolution, Real-time Geometry Video Acquisition," Computer Science Department, University of Missouri-Columbia, MO, Feb. 28, 2007
- 6. "High-resolution, Real-time 3-D Scanning using a Phase-shifting Method," Computer Science Department, Brown University, RI, Mar. 13, 2007
- "High-resolution, Real-time 3-D Shape Measurement and Its Applications," Mechanical Engineering Department, Iowa State University, IA, Apr. 2, 2008
- "High-resolution, Real-time 3-D Shape Measurement and Its Applications," Mechanical Engineering Department, University of Connecticut, CT, Apr. 17, 2008
- 9. "Real-time 3D shape modeling," ISU Deere Day, Ames, IA, Nov. 13, 2008
- 10. "High-resolution, real-time 3D scanning," SIAM Mathematics for Industry, San Francisco, CA, 2009
- 11. "Real-time 3D shape modeling," ISU Scholar's Day, Ames, IA, Feb 28, 2009
- 12. "High-resolution, real-time 3-D imaging and its applications," Mechanical Engineering Department, University of Iowa, September 10, 2009
- 13. "High-resolution, real-time fringe pattern profilometry," International Conference on Experimental Mechanics (ICEM 09), Singapore, Nov 19, 2009
- 14. "High-resolution 3-D shape measurement and its applications," Deere & Company, Waterloo, IA, Feb 18, 2010
- 15. "High-resolution 4-D imaging using fringe analysis," 44th Annual Conference on Information Sciences and Systems (CISS), Princeton, NJ, March 19, 2010
- 16. "Challenges in fringe projection techniques," Veeco Instruments, Inc., Tucson, AZ, June 8, 2010
- 17. "Some recent advance on high-speed, high-resolution 3-D shape measurement using projector defocusing," International Symposium on Optomechatronic Technologies (ISOT2010), Toronto, Canada, October 25, 2010
- 18. "High-resolution, real-time 3D modeling," ME 557 class, Ames, IA, November 04, 2010
- 19. "Superfast high-resolution 3-D imaging," Department of Electrical and Computer Engineering, Ryerson University, Toronto, Canada, November 26, 2010
- 20. "Real-time 3-D imaging," ISU Research Park, Ames, IA, February 10, 2011
- 21. "Superfast, high-resolution 3-D shape measurement techniques," Sichuan University, Chengdu, China, April 7, 2011
- 22. "Superfast, high-resolution 3-D imaging," University of Science & Technology of China, Hefei, China, April 11, 2011
- 23. "Superfast 3D shape measurement with binary defocusing techniques," ICCES, Nanjing, China, April 19, 2011
- 24. "Superfast, high-resolution 3-D shape measurement techniques," Zhejiang Normal University, Jinhua, China, April 23, 2011
- 25. "High-resolution 3-D shape measurement and its applications," Goodyear Co., Akron, OH, July 12, 2011

- 26. "High-resolution, superfast 3D imaging," Second Conference of Tsinghua Sanya International Mathematics Forum, Sanya, China, December 20, 2011
- 27. "High-resolution, superfast 3D imaging," 2011 International Workshop on Computational Conformal Geometry and Its Applications, National Chiao Tung University, Taiwan, December 24, 2011
- 28. "High-speed, high-resolution 3D geometric video scanning and compression," School of Computing, Clemson University, Clemson, SC, February 3, 2012
- 29. "High-speed, high-resolution 3D video imaging and compression," Autodesk Inc, San Francisco, CA, March 15, 2012
- 30. "kHz 3D imaging with binary phase-shifting techniques," ICCES, Crete, Greece, May 1, 2012 (Keynote)
- 31. "Recent work on superfast 3D imaging," National Chiao Tung University, Taiwan, July 16, 2012
- 32. "kHz 3D optical imaging using the binary defocusing technique," 3D Geometry/Imaging Conference, Yunnan, China, July 22, 2012
- "3D geometry video imaging, compression, and applications," ISU math department seminar, Ames, IA, Feb. 11, 2013
- "Virtual tool mark generation for efficient tool mark analysis," Midwest Forensic Resources Center, Ames, IA, Feb. 11, 2013
- 35. "Superfast 3D imaging and applications," ME departmental seminar, ISU, Ames, Iowa, Oct. 1, 2013
- 36. "High-resolution, superfast 3D imaging and applications," ISU Electrical and Computer Engineering department seminar, Ames, IA, Nov. 4, 2013
- 37. "High-resolution, superfast 3D optical sensing and applications," Mechanical Engineering Department, University of Maryland-Baltimore County, Baltimore, MD, April 18, 2014
- "High-resolution, superfast 3D optical sensing and applications," Purdue University, Department of Mechanical Engineering, West Lafayette, IN, April 24, 2014
- 39. "Active versus passive projector nonlinear gamma compensation method for high-quality fringe pattern generation," SPIE Sensing Technology + Application, Baltimore, MD, May 05, 2014
- 40. "High-resolution, superfast 3D optical sensing and applications," 3M Global TechForum, St. Paul, MN, May 20, 2014
- 41. "High-speed 3D shape measurement with fiber interference," SPIE Optics and Photonics, San Diego, California, August 19, 2014
- 42. "High-speed 3D optical sensing and applications," Department of Precision Machinery and Instrumentation, University of Science and Technology China, Hefei, China, October 7, 2014
- 43. "Binary dithered pattern optimization strategies for high-quality phase generation," SPIE/COS Photonics Asia, October 9, 2014
- 44. "Comparing digital-light-processing (DLP) and liquid-crystal-display (LCD) technologies for high-quality 3D shape measurement," SPIE/COS Photonics Asia, October 10, 2014
- 45. "High-speed 3D optical sensing and applications," College of Instrumentation and Optoelectronics, Beihang University, Beijing, China, October 11, 2014
- 46. "High-speed, multi-scale 3D optical sensing," Micro-Vu, Windsor, CA, March 16, 2015
- 47. "High-speed 3D optical sensing and applications," GE Global Research, Niskayuna, NY, April 3, 2015
- 48. "3D range data compression with a virtual fringe projection technique," SPIE Sensing Technology + Application, Baltimore, April 20, 2015
- 49. "High-speed 3D optical sensing and applications," Zhejiang University, Hangzhou, China, May 18, 2015
- 50. "High-resolution, superfast 3D optical sensing and applications," Hebei University of Technology, Tianjin, China, May 20, 2015
- 51. "High-resolution, superfast 3D optical sensing and applications," Hefei University of Technology, Hefei, China, May 25, 2015

- 52. "Challenges and opportunities in the field of 3D optical sensing," University of Science and Technology of China, Hefei, China, May 26, 2015
- 53. "High-resolution, high-speed 3D optical sensing," EITC-2015: Advancing Technology Innovations through Collaborations, Cambridge, MA, August 6, 2015
- 54. "Superfast 3D imaging technique and it applications," International Conference on Progresses in Combined Digital Optical and Imaging Methods Applied to Mechanical Engineering, Ascona, Switzerland, May 9, 2016
- 55. "Multi-scale real-time to superfast 3D imaging techniques, High-resolution, high-speed to superfast 3D imaging techniques," IEEE International Conference on Advanced Intelligent Mechatronics (AIM) Workshop, Banff, Canada, July 12, 2016
- 56. "High-resolution and high-speed 3D optical sensing and applications," 3rd Annual International Educational Conference: The Science of Measurement, The International Association of Forensic & Security Metrology, Orlando, FL, November 16, 2016
- 57. "High-speed 3D imaging using digital binary defocusing method vs sinusoidal method," SPIE Photonics West, San Francisco, CA, January 30, 2017
- 58. "High-resolution, high-speed 3D imaging and applications," Purdue University ASME Student Chapter Meeting, West Lafayette, IN, February 21, 2017
- 59. "High-resolution, high-speed 3D imaging and applications," Summer Undergraduate Research Fellowship (SURF) Seminar, Purdue University, West Lafayette, Indiana, June 22, 2017
- 60. "High-resolution, high-speed 3D imaging and applications," George Washington University, Washington DC, October 18, 2017
- 61. "High-resolution, high-speed 3D imaging and applications," Purdue Society of Professional Engineers, February 15, 2018
- 62. "Zhang's XYZT Laboratory- Innovation in technology to improve lives of many," Colloquium of Celebration of Middle Career Faculty, College of Engineering, Purdue University, February 23, 2018
- 63. "Superfast 3D optical metrology techniques and applications," Optical Made in China, Shanghai, China, March 15, 2018 (Keynote)
- 64. "Superfast 3D imaging techniques and applications," Workshop on Geometry, Imaging, and Computing, Harvard University, Cambridge, MA, March 26, 2018
- 65. "Recent research on high-resolution 3D range geometry compression," SPIE Commercial + Scientific Sensing, Orlando, Florida, April 18, 2018
- 66. "High-speed 3D shape measurement techniques and applications," International Conference on Optical and Photonic Engineering (icOPEN), Shanghai, China, May 9, 2018
- 67. "High-resolution, high-speed 3D imaging and applications," Shanghai University, Shanghai, China, May 10, 2018
- 68. "High-resolution, high-speed 3D imaging and applications," United Imaging Healthcare, Shanghai, China, May 11, 2018
- 69. "High-resolution, high-speed 3D imaging and applications," University of Huddersfield, Huddersfield, United Kingdom, June 29, 2018
- 70. "High-accuracy, high-speed 3D shape measurement techniques," International Conference on Experimental Mechanics, Brussels, Belgium, July 2, 2018 (keynote)
- 71. "High-speed 3D optical sensing, data processing and potential applications," Deere & Company, Cedar Falls, Iowa, July 26, 2018
- 72. "High-resolution, high-speed 3D imaging and applications," Tsinghua University, Beijing, China, October 10, 2018
- 73. "High-resolution, high-speed 3D imaging and applications," Nanjing University of Aeronautics and Astronautics, Nanjing, China, October 11, 2018
- 74. "Recent progress on high-speed 3D shape measurement with structured-light methods," SPIE Photonics Asia, Beijing, China, October 12, 2018

- 75. "High-speed 3D imaging and applications," School of Biomedical Engineering Graduate Seminar, Purdue University, West Lafayette, Indiana, October 31, 2018
- 76. "High-speed 3D optical sensing: potential for closed-loop additive manufacturing," 2019 NSF-Purdue Advanced Manufacturing/Nanomanufacturing Symposium, West Lafayette, Indiana, April 30, 2019
- 77. "High-resolution, high-speed 3D imaging and applications," Fudan University, Shanghai, China, May 23, 2019
- 78. "High-resolution, high-speed 3D imaging and applications," Nanjing University of Science and Technology, Nanjing, China, May 29, 2019
- 79. "High-resolution, high-speed 3D imaging and applications," Hehai University, Nanjing, China, June 3, 2019
- "High-resolution, high-speed 3D imaging and applications," Southeast University, Nanjing, China, June 3, 2019
- 81. "High-resolution, high-speed 3D imaging and applications," University of Science and Technology of China, Hefei, China, June 5, 2019
- "High-resolution, high-speed 3D imaging and applications," Tsinghua University, Beijing, China, June 10, 2019
- 83. "3D video compression and streaming," International Forum on Computational Optical Measurement and its Education, Nanjing, China, June 18, 2019
- "High-resolution, high-speed 3D imaging and applications," Shenzhen University, Shenzhen, China, June 19, 2019
- 85. "High-resolution, high-speed 3D imaging and applications," Orbbec Inc, Shenzhen, China, June 21, 2019
- 86. "High-speed, high-resolution 3D optical sensing and information processing for smart manufacturing," The 2019 International Conference on Frontiers of Design and Manufacturing, University of Michigan, Ann Arbor, Michigan, July 23, 2019 (Keynote)
- 87. "High-speed 3D shape measurement and application," MBL meets OPTIMESS, University of Antwerp, Antwerp, Belgium, September 19, 2019 (Keynote)

Contributed Conference & other Public Presentations

- 1. S. Zhang and P. Huang, "High-resolution, real-time 3D shape acquisition," IEEE Computer Vision and Pattern Recognition Workshop, Washington DC, MD, Jun. 28, 2004.
- 2. J. Pan, P. Huang, S. Zhang, and F.-P. Chiang, "Color n-ary gray code for 3-D shape measurement," 12th International Conference on Experimental Mechanics, Politecnico Di Bari, Italy, Aug., 2004
- 3. S. Zhang and P. Huang, "Phase error compensation for a 3D shape measurement system based on phaseshifting method," SPIE Optics East, Boston, MA, Oct., 2005.
- 4. P. S. Huang and S. Zhang, "Fast three-Step phase-shifting algorithm," SPIE Optics East, Boston, MA, Oct., 2005.
- 5. S. Zhang, D. Royer, X. Li, and S.-T. Yau, "High-resolution, real-time-geometry video acquisition," ACMSIG-GRAPH Sketches, Boston, MA, Jul. 2, 2006.
- 6. S. Zhang and S.-T. Yau, "Generic nonsinusoidal phase error correction for 3-D shape measurement using a digital video projector," SPIE Optics & Photonics, San Diego, CA, Aug. 15, 2006.
- 7. S. Zhang and S.-T. Yau, "High-resolution, real-time 3-D absolute coordinate measurement based on a phaseshifting method," SPIE Optics & Photonics, San Diego, CA, Aug. 15, 2006.
- 8. S. Zhang and S.-T. Yau, "Three-dimensional data merging using Holoimage," SPIE Optics East, Boston, MA, Sep. 12, 2007.
- 9. S. Zhang and S.-T. Yau, "High dynamic range scanning technique," SPIE Optics & Photonics, San Diego, CA, Aug. 10, 2008.
- 10. S. Zhang and S.-T. Yau, "Simultaneous geometry and color texture acquisition using a single-chip color camera," SPIE Optics & Photonics, San Diego, CA, Aug. 12, 2008.

- 11. S. Zhang, "Real-time 3D shape modeling," ISU Deere Day, Ames, IA, Nov. 13, 2008.
- 12. S. Zhang, "Real-time 3D shape modeling," ISU Scholar's Day, Ames, IA, Feb 28, 2009.
- S. Zhang, D. Eisenmann, and L. S. Chumbley, "Automatic 3D shape measurement noise reduction for an optical profilometer," OSA Topical Meeting on Holography and Three-Dimensional Imaging, Vancouver, Canada, April 28, 2009.
- 14. S. Zhang, "Digital multiple-wavelength phase-shifting algorithm," SPIE Optics & Photonics, San Diego, CA, 2009.
- 15. W. Lohry^{UG}, Y. Xu^{UG}, and S. Zhang, "Optimum checkerboard selection for accurate structured light system calibration," SPIE Optics & Photonics, San Diego, CA, 2009.
- S. Lei^G, N. Karpinsky^G, and S. Zhang, "High-resolution, real-time 3D scanning," SIAM Mathematics for Industry, San Francisco, CA, 2009.(invited)
- 17. N. Karpinsky^G, S. Lei^G, and S. Zhang, "High-resolution, real-time fringe pattern profilometry," International Conference on Experimental Mechanics (ICEM 09), Singapore, 2009 (Invited).
- 18. S. Zhang, "High-resolution, real-time 3-D imaging," HCI Open House, ISU, Feb. 19, 2010.
- N. Karpinsky^G and S. Zhang, "Composite method for discontinuous 3-D surface measurement: Simulations," International Conference on Advanced Phase Measurement in Optics and Imaging, Locarno, Switzerland, May 20, 2010.
- 20. S. Zhang and J. Oliver, "Flexible digital fringe projection system for step-height measurement," International Conference on Advanced Phase Measurement in Optics and Imaging, Locarno, Switzerland, May 20, 2010.
- S. Zhang, Y. Gong^G, J. Laughner, Q. Lou, I. R. Efimov, and D. van der Weide, "High-resolution, superfast 3-D imaging using a phase-shifting method," OSA Topical Meeting on Digital Image Processing and Analysis (DIPA), Tucson, AZ, June 9, 2010.
- 22. S Zhang, "High-speed, high-resolution 3-D imaging," ISU ME summer REU lunch lecture, June 17, 2010.
- 23. S Zhang, "High-speed, high-resolution 3-D imaging," ISU HCI REU lunch lecture, July 15, 2010.
- 24. J. Li^G and S. Zhang, "Generating sinusoidal fringe by defocusing: potentials for unprecedentedly high-speed 3-D shape measurement using a DLP projector," SPIE Optics & Photonics, San Diego, CA, Aug 2, 2010.
- 25. L. S. Chumbley, D. J. Eisenmann, M. Morris, S. Zhang, J. Kreiser, J. Craft, and C. Fisher, "Quantifications of toolmarks," NIJ Pattern and Impression Evidence Symposium, Clearwater Beach, FL, Aug 4, 2010.
- 26. J. I. Laughner, Y. Gong^G, B. A. Filas, S. Zhang, and I. R. Efimov, "Structured light imaging of epicardial mechanics," IEEE Engineering in Medicine and Biology Society (EMBS), Buenos Aires, Argentina, Sep 3, 2010.
- 27. W. Lohry^{UG}, B. Wang, H. Hu, and S. Zhang, "3-D shape measurement of liquid droplet with a structured light technique," 47th Annual Technical Meeting of Society of Engineering Science, Ames, IA, Oct 6, 2010.
- 28. Y. Xu^{UG} and S. Zhang, "Error analysis for 3-D shape measurement with projector defocusing," 47th Annual Technical Meeting of Society of Engineering Science, Ames, IA, Oct 6, 2010.
- 29. Y. Xu^{UG}, J. Dai, and S. Zhang, "Error analysis for 3-D shape measurement with projector defocusing," SPIE Photonics Asia, Beijing, China, Oct 20, 2010.
- S. Zhang, Y. Gong^G, Y. Wang^G, J. Laughner, I. R. Efimov, "Some recent advance on high-speed, high-resolution 3-D shape measurement using projector defocusing," International Symposium on Optomechatronic Technologies (ISOT2010), Toronto, Canada, Oct 25, 2010. (invited)
- 31. B. Wang, W. Lohry^{UG}, S. Zhang, and H. Hu, "Quantification of the transient behavior of wind-driven water droplets and rivulet flows on a substrate," 63rd Annual Meeting of the American Physical Society's Division of Fluid Dynamics (DFD), Long Beach, California, Nov 23, 2010
- 32. S. Zhang "Real-time 3-D imaging," ISU Research Park, Ames, IA, Feb. 10, 2011
- 33. S. Zhang "Real-time 3-D imaging," HCI Open House, ISU Feb.11, 2011
- 34. S. Zhang, L. S. Chumbley, M. Morris, B. King, T. Grieve, A. Hoeksema, Y. Gong, V. Villagomez^{UG}, D. J. Eisenmann, and J. Kreiser, "Manipulative virtual tools for toolmark characterization," AFTE Training Seminars, Chicago, IL, June 2, 2011

- 35. S. Zhang, "High-speed, high-resolution 3-D imaging," ISU HCI REU lunch lecture, June 9, 2011
- 36. S. Zhang, "High-speed, high-resolution 3-D imaging," ISU ME summer REU lunch lecture, July 7, 2011
- 37. L. Ekstrand^G and S. Zhang, "Auto-exposure for 3-D shape measurement using a DLP projector," SPIE Optics and Photonics, San Diego, CA, August 22, 2011
- 38. Y. Xu^{UG}, L. Ekstrand^G, and S. Zhang, "Unixial 3D shape measurement with projector defocusing," SPIE Optics and Photonics, San Diego, CA, August 23, 2011
- S. Zhang, "Superfast 3D geometry capture technique and its applications," Boeing visit, Ames, IA, March 1, 2012
- 40. S. Zhang, "High-speed, high-resolution 3-D imaging," ISU ME summer REU lunch lecture, June 7, 2012
- 41. S. Zhang, L. Ekstrand^G, T. Grieve, L. S. Chumbley, and M. Morris, "Three-dimensional data processing with advanced computer graphics tools," SPIE Optics and Photonics, San Diego, California, August 16, 2012
- 42. S. Zhang, "Virtual tool mark generation for efficient tool mark analysis," Midwest Forensic Resources Center, February 11, 2013
- 43. S. Zhang, Y. Wang^G, J. I. Laughner, I. R. Efimov, "Measuring dynamic 3D micro-structures using a superfast digital binary phase-shifting technique," ASME 2013 International Manufacturing Science and Engineering Conference, Madison, Wisconsin, June 11, 2013
- 44. J. Dai, B. Li^G, and S. Zhang, "Improve dithering technique for 3D shape measurement: phase vs intensity optimization," SPIE Optics and Photonics, San Diego, California, August 25, 2013
- 45. S. Zhang, "Superfast 3D imaging and applications," ME departmental seminar, ISU, Ames, Iowa, October 1, 2013
- 46. T. Bell^G and S. Zhang, "Towards superfast 3D optical metrology with digital micromirror device (DMD) platforms," SPIE Optics West, San Francisco, California, February 5, 2014
- 47. L. Ekstrand^G and S. Zhang, "Automated high-dynamic-range three-dimensional optical metrology technique," ASME 2014 Manufacturing science and Engineering Conference, Detroit, Michigan, June 13, 2014
- 48. J. Dai and S. Zhang, "Binary dithered pattern optimization strategies for high-quality phase generation," SPIE/COS Photonics Asia, October 9, 2014
- 49. C. Gong^{UG}, B. Li^G, and S. Zhang, "Comparing digital-light-processing (DLP) and liquid-crystal-display (LCD) technologies for high-quality 3D shape measurement," SPIE/COS Photonics Asia, October 10, 2014
- 50. B. Li^G and S. Zhang, "Poster: Structured light system calibration with optimal fringe angle," ASME Manufacturing Science and Engineering Conference, Charlotte, NC, June 8-12, 2015
- A. Wan, J. Xu, S. Zhang, Z. Zhang, and K. Chen, "Learning optimal measurement and control of assembly robot for large-scale heavy-weight parts," 2015 IEEE Conference on Robotics and Biomimetics (ROBIO), Zhuhai, China, December 8, 2015
- 52. C. Jiang^G and S. Zhang, "High-contrast 3D surface measurement without changing camera exposures," SPIE Defense and Commercial Sensing, Baltimore, MD, April 20, 2016
- 53. T. Bell^G and S. Zhang, "A comparative study on 3D range data compression methods," SPIE Defense and Commercial Sensing, Baltimore, MD, April 20, 2016
- L. S. Chumbley and S. Zhang, "MANTIS: Portable prototype system for toolmark research," The Association of Firearm and Tool Mark Examiners (AFTE) Annual Training Seminar, New Orleans, Louisiana, May 31, 2016
- 55. B. Li^G and S. Zhang, "High-resolution, high-speed to superfast 3D imaging techniques," IEEE International Conference on Advanced Intelligent Mechatronics (AIM), Banff, Canada, July 14, 2016
- 56. B. Li^G, Z. Liu^{UG}, and S. Zhang, "Motion artifact reduction using hybrid Fourier transform with phase-shifting methods," SPIE Optics and Photonics, San Diego, California, August 31, 2016
- 57. S. Zhang, J.-S. Hyun^G, and B. Li^G, "High-speed 3D imaging using digital binary defocusing method vs sinusoidal method," SPIE Photonics West, San Francisco, California, January 30, 2017

- 58. J.-S. Hyun^G and S. Zhang, "High-speed 3D surface measurement with mechanical projector," SPIE Defense and Commercial Sensing, Anaheim, California, April 13, 2017
- 59. Y. An^G and S. Zhang, "High-speed, high-resolution large range 3D measurement," SPIE Defense and Commercial Sensing, Anaheim, California, April 13, 2017
- 60. C. Jiang^G and S. Zhang, "Absolute phase unwrapping for dual-camera system without embedding statistical features," SPIE Defense and Commercial Sensing, Anaheim, California, April 13, 2017
- B. Li^G and S. Zhang, "3D dynamic strain measurement of inextensible thin membrane using structure light 3D imaging and geodesic computation," Engineering Mechanics Institute Conference, San Diego, California, June 5, 2017
- 62. S. Zhang, D. Baldwin, and J. Wolfe, "3D footwear and tire tread impression capture," Impression, Pattern and Trace Evidence Symposium (IPTES), Arlington, Virginia, January 23, 2018
- 63. S. Zhang and Y. Wang, "High-accuracy, real-time 3D shape measurement with double-pattern pulse width modulation techniques," SPIE Commercial + Scientific Sensing and Imaging, Orlando, Florida, April 18, 2018
- 64. Z. Liu^G and S. Zhang, "Motion-induced error compensation for phase shifting profilometry," SPIE Commercial + Scientific Sensing and Imaging, Orlando, Florida, April 18, 2018
- 65. T. Bell^G and S. Zhang, "High-resolution 3D optical sensing and real-time 3D data streaming,", IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Auckland, New Zealand, July 11, 2018
- 66. S. Zhang and D. Baldwin, "Workshop on 3D footwear and tire tread impression capture," The IAI's 103rd International Forensic Educational Conference, San Antonio, Texas, July 31, 2018
- 67. S. Zhang, D. Baldwin, and J. Wolfe, "Portable high-resolution automated 3D scanning system," IAFSM 5th Annual International Educational Conference, Fort Worth, Texas, December 13, 2018
- T. Bell^G and S. Zhang, "HoloReality: Real-time, row-bandwidth 3d range video communications on consumer mobile devices with application to augmented reality," IS&T International Conference on Electronic Imaging, Burlingame, California, January 16, 2019
- 69. C. Jiang^G and S. Zhang, "Development of a portable 3d scanning system for capturing shoe and tire impressions," IS&T International Symposium on Electronic Imaging, Burlingame, CA, January 16, 2019
- 70. Y. Wang, B. Li, and S. Zhang, "Motion induced error compensation method for digital fringe projection system," SPIE Photonics West, San Francisco, California, February 4, 2019
- 71. S. Zhang, "Comparing Hilbert transform profilometry and Fourier transform profilometry," SPIE Defense and Commercial Sensing, Baltimore, MD, April 16, 2019
- 72. S. Zhang, "3d video compression and streaming," International Forum on Computational Optical Measurement and its Education, Nanjing, China, June 18, 2019
- 73. J.-S. Hyun^G, M. G. Carmichael, A. Tran, S. Zhang, and D. Liu, "Evaluation of fast, high-detail projected light 3d sensing for robots in construction," IEEE 6th International Conference on Industrial Engineering and Applications, Xi'an, China, June 23, 2019
- S. Zhang, "High-speed, high-resolution 3d optical sensing and information processing for smart manufacturing," The 2019 International Conference on Frontiers of Design and Manufacturing, Ann Arbor, MI, June 21, 2019
- 75. J.-S. Hyun^G and S. Zhang, "High-speed 3d imaging with three binary patterns using Hilbert transform," SPIE Optics and Photonics, San Diego, California, August 13, 2019
- 76. J.-S. Hyun^G and S. Zhang, "Phase-based stereo matching for high-accuracy three-dimensional optical sensing," Frontiers in Optics + Laser Science APS/DLS, Washington DC, September 18, 2019
- 77. S. Zhang, "High-speed 3d shape measurement and applications," MBL meets OPTIMESS, Antwerp, Belgium, September 19, 2019

Students mentored

Graduate Students

- Current PhD Students
 - 1. Jae-sang Hyun, Direct Ph.D., degree expected: May 2020
 - 2. Michael Crawford, Direct Ph.D., degree expected: 2022
 - 3. Xiaowei Hu, visiting Ph.D. student
 - 4. Yi-Hong Liao, Ph.D., degree expected: May 2023
- Graduated PhD Students
 - 1. Nikolaus Karpinsky, "Portal-s: High-resolution, real-time 3D video telepresence," Ph.D., Iowa State University, December 2013
 - 2. Yajun Wang, "Superfast three-dimensional (3D) shape measurement with binary defocusing techniques and its applications," Ph.D., Iowa State University, December 2013
 - 3. Beiwen Li, "Superfast three-dimensional (3D) shape measurement with application to flapping wing mechanics analysis", Ph.D., Purdue University, August 2017
 - 4. Tyler Bell, Ph.D., "Holostream: High-accuracy, high-speed 3D range video encoding and streaming," Purdue University, August 2018
 - 5. Yatong An, Ph.D., "Multi-scale, multi-modal, high-speed 3D shape measurement," Purdue University, May 2019
- Current MS Students
 - 1. Michael Feller, BS/MS ME, degree expected: December 2019
 - 2. Michael Crawford, MS, degree expected: December 2019
- Graduated MS Students
 - 1. Shuangyan Lei, "A comparison study of digital sinusoidal fringe projection technique: defocusing binary patterns Vs focusing sinusoidal patterns," M.S., Iowa State University, December 2010
 - Nikolaus Karpinsky, "3D geometry compression with Holoimage," M.S., Iowa State University, May 2011
 - 3. Henri Bai(co-advised with Prof. Yan-bin Jia), "Software for simulated CT scanner table control in boluschasing angiography," M.S., Iowa State University, May 2012)
 - 4. Laura Ekstrand, "Virtual tool mark generation for efficient striation analysis in forensic science," M.S., Iowa State University, December 2012
 - 5. Beiwen Li, "High quality three-dimensional (3D) shape measurement using intensity-optimized dithering technique," M.S., Iowa State University, May 2014
 - 6. Tyler Bell, "High-quality, real-time 3D video visualization in head mounted displays," M.S., Iowa State University, August 2014
 - 7. Chen Gong, None-thesis, May 2016

Undergraduate students

- Current: Brian Jeffrey Acosta, Saw Yan Naung, Jialei Wang
- *Former*: Ziyu Chen, Sam Robinson, Victor Emmanuel Villagomez, Brandon Bodnar, Kelly Byron, Linh Pham, Joshua Situka, Katherine Kopytko, Alex Nelson, Shoma Chandra, Vincent Chen, Leah Merner, Ying Xu, John Gibson, Jill Middendorf, William Lohry, Yehoshua Meyer, Yang Hong, Morgan Hoke, Chen Gong, Jonathan Clark, Sam Ennis, Ian Van Schepen, Megan Wong, Kenneth Paul, Jiayi Shao, Zexuan Zhu, Emma Grammer, Weidong Huang, Ziping Liu, Bogdan Vlahov, Beatrice Lim, Michael Crawford, Enle Choo, Xia Chen, Laura Mudge, Robert Leslie Herting III, Peter Zibley

K-12 students

Vaelan Molian, Eunice Kong, Kerui Tan, Elvin Tan

Postdoctoral and visiting scholars mentored

- 1. Vincent Chen, University of Toronto, Canada, 06/01/2012-08/01/2012
- 2. Professor Pan Ou, Beihang University, 04/13/2012-05/14/2013
- 3. Meng-Chien Lin, National Chiao-Tung University, Taiwan, 03/10/2014-12/14/2014
- 4. Professor Junfei Dai, Zhejiang University, 08/01/2016-7/31/2017
- 5. Professor Xiaoyuan He, Southeast University, 8/10/2018-10/30/2018
- 6. Xiaowei Hu, Tsinghua University, 10/2018-present
- 7. Professor Min Zhong, Chengdu University of Information Technology, 2/2019-present
- 8. Ruitao Zhang, Shanghai Jiaotong University, 7/2019-9/2019
- 9. Professor Andres G. Marrugo (Fulbright Scholar), Universidad Tecnologica de Bolivar (Colombia), 10/2019present

Graduate thesis committees (other than chaired) served

- Completed graduate students at Iowa State University
 - 1. Joseph Holub, 2010, M.S., Prof. Eliot Winer, Human Computer Interaction, committee member, committee member
 - 2. Brett Nekolny, 2010, M.S., Prof. Eliot Winer, Mechanical Engineering, committee member
 - 3. Xiangwen Chen, 2011 Ph.D., Prof. Xinwei Wang, Mechanical Engineering, committee member
 - 4. Xiaopeng Huang, 2011, Ph.D., Prof. Xinwei Wang, Mechanical Engineering, committee member
 - 5. Yanan Yue, 2011, Ph.D., Prof. Xinwei Wang, Mechanical Engineering, committee member
 - 6. Ruqin Zhang, 2011, Ph.D., Prof. James Oliver and Prof. Eliot Winer, Mechanical Engineering, committee member
 - 7. Lei Zhang, 2011, Ph.D., Professor Song-Charng Kong, Mechanical Engineering, committee member
 - 8. Xuhui Feng, 2012, Ph.D., Prof. Xinwei Wang, Mechanical Engineering, committee member
 - 9. Trevor Richardson, 2013, M.S., candidate, Professor Eliot Winer and Professor James Oliver, Mechanical Engineering and Human Computer Interaction
 - 10. Jinjuan She, 2013, Ph.D., Prof. Erin MacDonald, Mechanical Engineering, committee member
 - 11. Ken Kopecky, 2014, Ph.D., Professor Eliot Winer, Mechanical Engineering and Human Computer Interaction
 - 12. Benjamin Halls, 2014, Ph.D., Professor Terry Meyer, Mechanical Engineering
 - 13. Ryan Spotts, 2014 M.S., Professor L. Scott Chumbley, Materials Science and Engineering
 - 14. Mengzhe Zhang, 2014 M.S., Prof. Sourabh Bhatachaya, Mechanical Engineering
- In-progress graduate students
 - 1. Jongseong Choi, Ph.D. candidate, Professor Shirley Dyke, Mechanical Engineering
 - 2. Chun-Hao Hsu, Ph.D. candidate, Professor George Chiu, Mechanical Engineering
 - 3. Val Coleton Joiner, Ph.D. candidate, Professor Guillermo Paniagua, Mechanical Engineering
 - 4. Luis Paredes, Ph.D. candidate, Professor Karthik Ramani, Mechancial Engineering
 - 5. Tianyi Wang, Ph.D. candidate, Professor Karthik Ramani, Mechanical Engineering
 - 6. Chenghao Bi, M.S., candidate, Professor David Cappelleri, Mechanical Engineering
 - 7. Yijie Wang, M.S., candidate, Professor Jun Chen, Mechanical Engineering
 - 8. Georges Adam, Ph.D. candidate, Professor David Cappelleri, Mechanical Engineering
 - 9. Ke Huo, Ph.D. candidate, Professor Karthik Ramani, Mechanical Engineering
 - 10. Ze An, M.S. candidate, Professor David Cappelleri, Mechanical Engineering
 - 11. Chenghao Bi, Ph.D. candidate, Professor David Cappelleri, Mechanical Engineering
 - 12. Xiaoyu Liu, Ph.D. candidate, Professor Shirley Dyke, Mechanical Engineering
 - 13. Bo Ji, M.S. candidate, Professor David Cappelleri, Mechanical Engineering

Teaching Interests

Systems, Measurements and Control, Instrumentation, Geometric Modeling, Computer Graphics, Machine Vision, Engineering Optics, Optical Metrology.

Course Taught

Purdue University

- ME 375: System Modeling and Analysis, Spring 2015 (96 students), 100% responsible
- ME 375: Systems, Measurements and Control (SMAC) II, Fall 2015 (32 students), 100% responsible
- ME 375: Systems, Measurements and Control (SMAC) II, Spring 2016 (65 students), 100% responsible
- ME 365: Systems, Measurements and Control (SMAC) I, Fall 2016 (92 students), 100% responsible
- ME 365: Systems, Measurements and Control (SMAC) I, Spring 2017 (47 students), 100% responsible
- ME 375: Systems, Measurements and Control (SMAC) II, Fall 2017 (62 students), 100% responsible
- ME 365: Systems, Measurements and Control (SMAC) I, Spring 2018 (38 students), 100% responsible
- ME 365: Systems, Measurements and Control (SMAC) I, Fall 2018 (58 students), 100% responsible

Iowa State University

- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Spring 2009 (111 students, 4 TAs, 1 Grader), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Fall 2009 (92 students, 4 TAs), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Spring 2010 (129 students, 4 TAs, 1 Grader), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Fall 2010 (71 students, 4 TAs), 100% responsible
- ME 557 XE: Computer Graphics and Geometric Modeling, Fall 2011 (4 students, 0.5 TA), 100% responsible
- ME 557: Computer Graphics and Geometric Modeling, Fall 2011 (20 students, 0.5 TA), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Labs: Spring 2012 (152 students, 5 TAs), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Summer 2012 (12 students, 1 TA), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Fall 2012 (120 students, 4 TAs), 100% responsible
- ME 556XE: Machine Vision, Spring 2013 (2 students), 100% responsible
- ME 556X: Machine Vision, Spring 2013 (11 students), 100% responsible
- ME 370: Engineering Measurements and Instrumentation (Lectures + Labs), Fall 2013 (126 students, 4 TAs), 100% responsible
- ME160: Mechanical Engineering Problems Solving with Computer Applications, Fall 2014 (27 students), 100% responsible

Media Coverage

- "First electronic perception technology workshop draws top scientists, reports canesta," Roeder-Johnson (July 21, 2005)
- "Look for the future of games," Famitusu (in Japanese) (July 30, 2006)
- "SIGGRAPH 2006, Emerging Technologies," Journal of MyCom (in Japanese) (August 10, 2006)
- "Time for makeovers," 3D World Magazine (UK) (September 25, 2006)
- "New 3-D video may help patients with facial paralysis," Medical News Today (September 17, 2007)
- "Facial paralysis," ENT News (Vol. 15, No. 5, 2008)
- "Generating 3D models on the fly," VRAC VRTech News (Spring 2009)
- "Lifelike Look," The Magazine of ASME (Vol. 132, No. 10, October 2010)
- "ME professor looks to expand 3D imaging applications," I3A (August 17, 2010)
- "Rock bands use 3D imaging technology developed for medical applications by Song Zhang and Nik Karpinsky," SPIE member news (August 18, 2010)
- "Real-time 3-D medical imaging technique attracts the entertainment world", Congoo (August 16, 2010)
- "Real-time 3D medical imaging technique attracts the entertainment world," SPIE the Scientist for the Electronic Imaging & Signal Processing (August 16, 2010)
- "Eye popping from MTV to the lab, The Scientist," The-Scientist Magazine (August 13, 2010); ISU News (August 13, 2010)
- "New 3-D imaging technology draws attention of rock stars and Hollywood," UIS Techno news (June 27, 2010)
- "3D research drawing interest from doctors, security experts, rock stars," Homeland Security News Wire (June 25, 2010)
- "Meglio del 3D," Ulisse Scienza (June 21, 2010) (In Italian); OggiScienza (June 21, 2010) (In Italian); ?Meglio del 3D," Climatrix (June 22, 2010) (In Italian)
- "ISU 3-D research drawing interest from doctors, security experts, rock stars," Radio Iowa (June 20, 2010)
- "ISU 3-D imaging technology catches eyes of hospitals, Hollywood," The Tribune, Ames (June 19, 2010)
- "New 3-D imaging technology draws attention of rock stars and Hollywood," Photonics online (June 18, 2010)
- "Radiohead video features real-time 3-D," Futurity: Discover and the Future (June 18, 2010)
- "Rock, vedetesi technologie 3D in time real," Ziarul Stiintelor (June 17, 2010) (in Romanian); StiintaAzi (June 17, 2010) (in Romanian)
- "Iowa state 3-D tech goes Hollywood," Photonics (June 17, 2010)
- "3-D tech reach rock star status," Laboratory Equipment (June 17, 2010)
- "Rock stars, Hollywood take a look at researcher's unique 3-D technology," ISU news release (June 15, 2010); Physorg (June 15, 2010); Newswise (June 15, 2010); First Science (June 15, 2010); Eurek Alert! (June 15, 2010); CoE news release (June 15, 2010); News Blaze (June 16, 2010); Laboratory Manager Magazine (June 16, 2010); Communications of the ACM (June 16, 2010)
- "Probes watch your heart skip a beat," Photonics, November, 2012
- "Material Witness: Midwest Forensics Resource Center lends scientific expertise to law enforcement, Inquiry (Ames Lab)," Issue 2, pp. 5-9, 2012
- "3D video calls a step closer," The Sydney Morning Herald (Australia), December 23, 2013; The Age (Australia), December 23, 2013; The Canberra Times (Australia), December 24, 2013; The WA Times, December 24, 2013; Women Citizen, December 26, 2013; ACM TechNews Siggchi Edition, January 2014; International Society for Presence Research, January 2, 2014; Telepresence Options, January 2, 2014
- "Is 3D teleconferencing the future of unified communications?" Industry Buzz, amcom (Australian), December 6, 2013
- "Researchers develop 3-D teleconferencing technology," Iowa State Daily, November 13, 2013

- "Real-time 3D conferencing," Iowa Public Ratio, November 8, 2013
- "3D conferences now a reality," Pune Mirror, November 6, 2013
- "And Now the Good News #57" November 5, 2013
- "Hologram Teleconferences Will Let You Beam in Your Coworkers Like Tupac", Slate, November 5, 2013
- "Teleconferencias en 3-D para smartphones," LA Nacion, November 4, 2013; Amambay Noticias, November 4, 2013
- "Crean un sistema de teleconferencias en 3-D para smartphones," Tendencias21, November 4, 2013; La Universal Radio; November 5, 2013
- "Technology yields real-time 3D teleconferencing," Laboratory Equipment, November 4, 2013
- "Engineerz develop real-time, 3-D teleconferenc' technology (w/ video)," Geek Gawk, November 1, 2013
- "Smartphones soon to get real-time 3-D video conferencing: Researcher," Slashdot, November 1, 2013; The Raw Story, November 2, 2013
- "Engineers develop real-time 3-D teleconferencing technology," Communications of the ACM, November 1, 2013; Tracktec, November 2, 2013
- "Engineers develop real-time 3-D teleconferencing technology (w/ video)," Phys Org, November 1, 2013
- "Real-time, 3-D teleconferencing technology developed," Science Daily, Oct. 31, 2013; Tech in America, November 4, 2013
- "Iowa State, Ames Lab engineers develop real-time, 3-D teleconferencing technology," ISU News Release Oct. 30, 2013; Newswise, Nov. 1, 2013; Innovation Toronto, Nov. 2, 2013 ? ?Superfast 3D optical sensing using fiber interference," SPIE Newsroom, 2014
- "Project to help bring widespread use of micro-robotics," Purdue News Release, August 3, 2016; Nanotechnology, August 3, 2016; Nano Werk, August 3, 2016; Phys Org, August 4, 2016
- "User friendly crime scene forensics for snow and soil," photonics, November 1, 2016
- "New portable forensic tech captures shoe prints instantly in 3-D," Forensic Magazine, November 1, 2016
- "High-resolution 3-D images of shoe prints, tire tracks in snow and soil for crime-scene forensics," Techxplore, November 2, 2016
- "Purdue made a tool to create 3D images from shoe prints," Inverse, November 2, 2016
- "Purdue researchers working on 3-D forensics technology," Indiana 105, November 2, 2016; Wake Radio, November 2, 2016; X-Rock 103, November 2, 2016
- "new portable crime-scene forensics tech makes it easier to image evidence in snow and soil," Lab Manager, November 2, 2016
- "New 3-D crime-scene forensics technology," Homeland Security News Wire, November 3, 2016
- "3D forensics capture shoe prints instantly in three dimensions," all3dp, November 4, 2016; Microfabricator, November 4, 2016
- "3D imaging technology could help forensic examiners make 3D printing model," iFunn (in Chinese), November 7, 2016; 3Dprint (in Chinese), November 8, 2016; 3Dhoo (in Chinese), November 8, 2016; 3Dzhidao (in Chinese), November 8, 2016; itmsc (in Chinese), November 8, 2016
- "3D imaging in forensics, Technology Networks," November 14, 2016
- "Purdue developed tech could play vital role in crime scene forensics," WLFI, November 26, 2016
- "Purdue-developed know-how might play a must have function in crime-scene forensics," Napo Tech News, November 27, 2016
- "Hyperspectral Imaging Reopens Amelia Earhart Search LIGHT MATTERS," Photonics Media (Science & Technology), November 30, 2016
- "Portable 3-D imaging for footprints and tire tread marks at crime scenes," Patrol Log, January 20, 2017
- "'Holostream' allows high-quality wireless 3-D video communications," Purdue News Release, January 9, 2018; Big Ten Academic Alliance Newswire, January 9, 2018; R&D Magazine, January 9, 2018; Purdue Today "In the SpotLight", January 10, 2018

- "Holostream enables high-quality 3D video communication on standard mobile devices," Naudox, January 11, 2018
- "3D "videophone" calls are possible using existing wireless networks," The Engineer, January 10, 2018
- "Purdue professor develops way to transmit 3D images through phones," Indianapolis Business Journal, January 12, 2018
- "3D-Videos drahtlos und in Echtzeit übertragen," Win Verlag, January 12, 2018; link:http://www.win-verlag.de/3d-videos-drahtlos-und-echtzeit-uebertragen
- "Holostream The first platform to record and stream 3D images in real time," Steemit, January 14, 2018
- "High-quality 3-D video communication on mobile devices using existing standard wireless networks," Innovation Toronto, January 15, 2018
- "Purdue professor develops 3D image transmission technology," Biometrics Update, January 16, 2018
- "Bored by Skype and FaceTime? 3D video chat is on its way to a phone near you," Digital Trends, January 16, 2018; Yahoo News, January 16, 2018; CET US News, January 16, 2018
- "New Holostream tech allows high-quality wireless 3-D video communications," International Society of Presence Research, January 23, 2018; Telepresence Options, January 25, 2018
- "Streaming 3D faces data research," fxguide, January 29, 2018
- "This new platform allows video chat with holograms," Mashable, January 29, 2018
- "Holostream permite comunicaciones de video 3D inalambricas de alta calidad," PDM Productos Digitales Moviles, January 31, 2018
- "Holostream tech allows high-quality wireless 3-D videocalls," Spinoff, February 7, 2018
- "Holostream 3-D video chat replacing FACETIME," Meero, February 19, 2018

University and Department Services

Purdue University

- Graduate Committee (2015 fall pres)
- Math Area Exam Committee (2015 fall pres)
- Graduate Student Admission Committee (2016 fall pres)
- Lambert Fellowship Evaluation Committee (SMAC area) (2016 fall, 2018 spring)
- Undergraduate Faculty Mentoring Program (2017 spring pres)
- Undergraduate Research Recourse Team (2017 spring pres)
- Strategic Plan-Work Group 3: Discovery with Innovation (2017 fall)

Iowa State University

- Department Computing (2008-2010)
- Course Development Committee for ME 370 (2008-2014)
- Engineering Fee Task Force (2012-pres)
- Graduate Studies Committee (2010-2014)
- Engineering College Big Data Faculty Search Committee (2013-2014)
- Undergraduate Studies Committee (2013-2014)

Professional Services

- *NSF panelist*: Sensors and Sensing Systems (2009, 2014), Manufacturing Machines and Equipment (2013, 2014); Small Business Innovation Research (2014, 2015, 2016)
- *NIH panelist*: NIBIB K & R13 (2014,2015)
- *Proposal reviewer*: Israel Science Foundation, Israel (2008); The 5th Translational R&D and Innovation Fund Grant, Singapore (2014); Mechanics of Materials (2014)
- Editor of journals: Associate Editor for Optics and Lasers in Engineering (2019-pres.); Technical Editor for IEEE/ASME Transactions on Mechatronics (2019-pres)
- *Editorial board of journals*: Optics and Lasers in Engineering (2013-2019); World Journal of Radiology (2009-2012); Global Journal of Physics Express (2010-2012)
- *Leading guest editor* with Rongguang Liang and Lianxiang Yang: Special section on high-speed 3D optical metrology and applications, Optical Engineering, 2014
- *Co-Guest Editor*: With Xiang Chen (lead editor), J. Geraedts, Focused Section: Sensing and Perception Systems for Intelligent Manufacturing (SPIM), IEEE/ASME Transactions on Mechatronics, 2018
- *Co-Guest Editor*: with Xiang Chen (lead editor), Mathehieu Grossard, Naoyuki Kubota, Dirk Wollherr, and Simon Yang, Focused Section on Sensing and Perception for Autonomous and Networked Robotics, International Journal of Intelligent Robotics and Applications, 2017
- Conference Organizer/Chair
 - Co-chair for the Mini Symposium on 3-D Optical Metrology for series of Modern Experimental Methods in Mechanics, Engineering, and Sciences, ICCES2011, Nanjing, China, April 18-21, 2011
 - Co-chair for Symposium in Honour of Professor Fu-pen Chiang, on the Occasion of his receiving the ICCES Lifetime Achievement Medal, Modern Experimental Methods in Mechanics, Engineering, and the Sciences, ICCES 2012, Crete, Greece, April 30-May 4, 2012
 - Initiator and chair, Symposium of optical metrology and imaging for manufacturing industry, ASME Manufacturing Science and Engineering Conference, Detroit, MI, 2014
 - Co-chair, SPIE Sensing Technology and Applications (Dimensional optical metrology and inspection for practical applications), Baltimore, MD, May 5-9, 2014

- Chair, SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications III), Beijing, China, October 9-11, 2014
- Chair, SPIE Sensing Technology + Applications (Dimensional optical metrology and inspection for practical applications IV), Baltimore, MD, April 20-24, 2015
- Chair, SPIE Defense + Commercial Sensing (Dimensional optical metrology and inspection for practical applications IV), Baltimore, MD, April 17-21, 2016
- Chair, 17th international Conference on Experimental Mechanics (Experimental Mechanics in honor of Professor Fu-pen Chiang), Rhodes, Greece, July 3-7, 2016
- Chair, IEEE International Conference on Advanced Intelligent Mechatronics (Sensing and Perception Methods and Systems for Mechatronics), Banff, Canada, July 12-15, 2016
- Chair, SPIE Photonics Asia (Optical Metrology and Inspection for Industrial Applications IV), Beijing, China, October 12-15, 2016
- Chair, SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VI), Anaheim, CA, April 9-13, 2017
- Chair, SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VII), Orlando, FL, April 15-19, 2018
- Chair, SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications V), Beijing, China, October 11-13, 2018
- Chair, SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VIII), Baltimore, MD, April 15-19, 2019
- Co-Chair, International Conference on Optical and Photonic Engineering (icOPEN), Phuket, Thailand, July 16-20, 2019
- Chair, SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications VI), Hangzhou, China, October 20-23, 2019
- Chair, SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VIV), Baltimore, MD, April 26-30, 2020
- Scientific advisory board
 - International Conference on Experimental Mechanics (ICEM), Rhodes, Greece, 2016
- Conference International Advisory Board
 - International Conference on Optical and Photonic Engineering, Shanghai, China, May 8-11, 2018
 - Asian Conference on Experimental Mechanics, Xian, China, October 11-18, 2018
- Program Committee
 - SPIE Optics & Photonics (Interferometry XIV: Techniques and Analysis), San Diego, CA, August 10-14, 2008
 - SPIE Optics & Photonics (Optical Inspection and Metrology for Non-Optics Industries), San Diego, CA, August 2-6, 2009
 - SPIE Optics & Photonics (Interferometry XV: Techniques and Analysis), San Diego, CA, August 1-5, 2010
 - SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications), Beijing, China, October 18-20, 2010
 - Mini Symposium on 3-D Optical Metrology for series of Modern Experimental Methods in Mechanics, Engineering, and Sciences, ICCES2011, Nanjing, China, April 18-21, 2011
 - SPIE Optics & Photonics (Dimensional Optical Metrology and Inspection for Practical Applications), San Diego, CA, August 28-September 1, 2011
 - Symposium in honour of Professor Fu-pen Chiang, on the Occasion of his receiving the ICCES Lifetime Achievement Medal, Modern Experimental Methods in Mechanics, Engineering, and the Sciences, ICCES 2012, Crete, Greece, April 30-May 4, 2012

- SPIE Optics & Photonics (Interferometry XVI: Techniques and Analysis), San Diego, CA, August 12-16, 2012
- SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications II), Beijing, China, October 12-14, 2012
- SPIE Optics & Photonics (Dimensional Optical Metrology and Inspection for Practical Applications II), San Diego, CA, August 25-29, 2013
- International Symposium on Optomechatronic Technologies (ISOT2013), Jeju, Korea, October 28-30, 2013
- IEEE Int'l Conference on Multimedia and Expo (ICME 2013), San Jose, CA, July 15-19, 2013
- SPIE Sensing Technology + Applications (Dimensional optical metrology and inspection for practical applications III), Baltimore, MD, May 5-9, 2014
- Symposium of optical metrology and imaging for manufacturing industry, ASME Manufacturing Science and Engineering Conference, Detroit, MI, June 9-13, 2014
- IEEE International Conference on Multimedia and Expo (ICME 2014), Chengdu, China, Jul. 14-18, 2014
- SPIE Optics & Photonics (Interferometry XVII: Techniques and Analysis), San Diego, CA, August 17-21, 2014
- SPIE Photonics Asia (Dimensional optical metrology and inspection for industrial applications III), Beijing, China, October 9-11, 2014
- International Symposium on Optomechatronic Technologies (ISOT2014), Seattle, WA, Nov. 4-7, 2014
- SPIE Sensing Technology + Applications (Dimensional optical metrology and inspection for practical applications IV), Baltimore, MD, April 20-24, 2015
- International Conference on Computational & Experimental Engineering and Sciences, Reno, NV, July 20-24, 2015
- International Workshop on 3D Imaging, Metrology, and Security, Shenzhen, China, September 26-29, 2015
- SPIE Defense and Commercial Sensing (Dimensional optical metrology and inspection for practical applications V), Baltimore, MD, April 17-21, 2016
- 17th international Conference on Experimental Mechanics (Experimental Mechanics in honor of Professor Fu-pen Chiang), Rhodes, Greece, July 3-7, 2016
- IEEE International Conference on Advanced Intelligent Mechatronics (Sensing and Perception Methods and Systems for Mechatronics), Banff, Canada, July 12-15, 2016
- SPIE Optics and Photonics (Interferometry XVIII), San Diego, CA, August 28-September 1, 2016
- SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications IV), October 12-14, Beijing, China, 2016
- International Symposium on Optomechatronic Technologies (ISOT), November 7-9, Itabashi, Tokyo, 2016
- SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VI), Anaheim, CA, April 9-13, 2017
- SPIE Photonics West (Emerging Digital Micromirror Device Based Systems and Application X), San Francisco, CA, January 26-February 1, 2018
- SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications V), Orlando, FL, April 15-19, 2018
- SPIE Optics and Photonics (Interferometry XIX), San Diego, CA, August 21-23, 2018
- SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications V), Beijing, China, October 11-13, 2018
- SPIE Photonics West (Emerging Digital Micromirror Device Based Systems and Application XI), San Francisco, CA, February 2-7, 2019
- SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VIII), Baltimore, MD, April 15-19, 2019
- SPIE Optics and Photonics International Congress (Optical Technology and Measurement for Industrial Applications Conference), Yokohama, Japan, April 23-26, 2019

- International Conference on Optical and Photonic Engineering (icOPEN), Phuket, Thailand, July 16-20, 2019
- SPIE/COS Photonics Asia (Optical Metrology and Inspection for Industrial Applications VI), Hangzhou, China, October 20-23, 2019
- SPIE Photonics West (Emerging Digital Micromirror Device Based Systems and Application X), San Francisco, CA, February 1-6, 2020
- SPIE Optics and Photonics International Congress (Optical Technology and Measurement for Industrial Applications Conference), Yokohama, Japan, April 21-24, 2020
- SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VIV), Anaheim, MD, April 26-30, 2020
- SPIE Optics and Photonics (Interferometry XX), San Diego, CA, August 23-27, 2020
- Conference Session Chair
 - SPIE Optics & Photonics (Interferometry XIV: Techniques and Analysis), San Diego, CA, August 10-14, 2008
 - SPIE Optics & Photonics (Optical Inspection and Metrology for Non-Optics Industries), San Diego, CA, August 2-6, 2009
 - SPIE Optics & Photonics (Interferometry XV: Techniques and Analysis), San Diego, CA, August 1-5, 2010
 - Mini Symposium on 3-D Optical Metrology for series of Modern Experimental Methods in Mechanics, Engineering, and Sciences, ICCES2011, Nanjing, China, April 18-21, 2011
 - SPIE Optics & Photonics (Dimensional Optical Metrology and Inspection for Practical Applications), San Diego, CA, August 28-September 1, 2011
 - Symposium in honour of Professor Fu-pen Chiang, on the Occasion of his receiving the ICCES Lifetime Achievement Medal, Modern Experimental Methods in Mechanics, Engineering, and the Sciences, ICCES 2012, Crete, Greece, April 30-May 4, 2012
 - SPIE Optics & Photonics (Interferometry XVI: Techniques and Analysis), San Diego, CA, August 12-16, 2012
 - SPIE Optics & Photonics (Dimensional Optical Metrology and Inspection for Practical Applications II), San Diego, CA, August 25-29, 2013
 - SPIE Sensing Technology + Applications (Dimensional optical metrology and inspection for practical applications III), Baltimore, MD, May 5-9, 2014
 - Symposium of optical metrology and imaging for manufacturing industry, ASME Manufacturing Science and Engineering Conference, Detroit, MI, June 9-13, 2014
 - SPIE Optics & Photonics (Interferometry XVII: Techniques and Analysis), San Diego, CA, August 17-21, 2014
 - SPIE Photonics Asia (Dimensional optical metrology and inspection for industrial applications III), Beijing, China, October 9-11, 2014
 - SPIE Sensing Technology + Applications (Dimensional optical metrology and inspection for practical applications IV), Baltimore, MD, April 20-24, 2015
 - SPIE Defense and Commercial Sensing (Dimensional optical metrology and inspection for practical applications V), Baltimore, MD, April 17-21, 2016
 - International Conference on Processes in Combined Digital Optical and Imaging Methods applied to Mechanical Engineering, Ascona, Switzerland, May 8-13, 2016
 - 17th international Conference on Experimental Mechanics (Experimental Mechanics in honor of Professor Fu-pen Chiang), Rhodes, Greece, July 3-7, 2016
 - IEEE International Conference on Advanced Intelligent Mechatronics (Sensing and Perception Methods and Systems for Mechatronics), Banff, Canada, July 12-15, 2016
 - SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VI), Anaheim, CA, April 9-13, 2017
 - SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications V), Orlando, FL, April 15-19, 2018

 SPIE Commercial + Scientific Sensing and Imaging (Dimensional optical metrology and inspection for practical applications VIV), Baltimore, MD, April 26-30, 2019

- *Conference paper reviewer*: IEEE/RSJ International Conference on Intelligent Robots and Systems, 2009; ASME 2010 World Conference on Innovative Virtual Reality (WinVR), Ames, IA, 2010; The 6th annual IEEE Conference on Automation Science and Engineering (CASE 2010), 2010; ISOT 2010 International Symposium on Optomechatronic Technologies, Toronto, Canada, 2010; 17th International Conference on Methods and Models in Automation and Robotics, Miedzyzdroje, Poland, 2012; IEEE International Conference on Multimedia & Expo, San Jose, CA, 2013; ISOT 2013 International Symposium on Optomechatronic Technologies, Jeju Island, Korea, 2013
- Journal reviewer: Optics Letters; Optics Express; Applied Optics; Optical Engineering; Machine Vision & Applications; Measurement; Computer Vision and Image Understanding; Optics & Laser Technology; Optics & Lasers in Engineering; Modern Optics; Sensors; Optical Society of American A; Journal of Mathematical Imaging and Vision; Computer Vision and Imaging Understanding Special Issue: 3DIM 3D Imaging/Modeling; Metrologia; Optics Communications; Advances in Optics and Photonics; IEEE Transaction on Mechatronics; Measurement Science & Technology; Strain; Chinese Optics Letters; IEEE Journal of Selected Topics in Signal Processing; Composites Part A; Image and Vision Computing; Computers in Industry; IEEE Transactions on Pattern Analysis and Machine Intelligence; SPIE Electronic Imaging; IEEE Transactions on Imaging Processing; CAD/Graphics; Machining Science and Technology; European Journal of Optical Society: Rapid publication; IEEE Transactions on Circuits and Systems for Video Technology; Scientific Reports; Bioinspiration & Biomimetics
- *Book reviewer*: Depth Map and 3D Imaging Applications: Algorithms and Technologies, Measurement and Instrumentation: Theory and Application
- Public service: Numerous demonstrations to K-12 students and teachers, visitors, and the general public.

Consulting Experiences

- 3DDigital Corporation, Sandy Hook, Connecticut (2006)
- Geometric Informatics Inc, Somerville, Massachusetts (2008-2014)
- Orbbec3D, Troy, Michigan (2019-present)

Memberships

International Society for Optical Engineering (SPIE fellow member); American Society of Mechanical Engineers (ASME); Optical Society of America (OSA fellow member); American Society of Engineering Education (ASEE); Sigma Xi (full member).