Shuochen Su shuochsu.github.io | shuochen.su@gmail.com | (206) 887-3346

Specialization, Skills, and Impact

Specialization
- 3D vision and graphics, depth estimation, sensor fusion, scene reconstruction, view synthesis
- Low-level vision, image and video processing, computational photography and imaging

Skills
- Machine learning, numerical optimization
- C++, Python, MATLAB

Impact
- Proven track record of defining and shipping 0-to-1 products and features in the domains of Augmented & Mixed Reality, Wearable & Contextual AI, Digital Visual Effects, and Giga-Pixel Panoramic Photography.
- 10+ first and senior-authored publications in top-tier CV and ML conferences with 1,000+ total citations and multiple tech transfers.
- 10+ U.S. patents.

Work Experience

Meta Reality Labs, Redmond, WA — Sept. 2018 - Present

Tech Lead and Manager at Cameras and Depth Group.
- Research and development of CV and ML algorithms for machine perception, photographic imaging, and contextual AI.
- Lead a team of researchers, engineers, and prototypers to conduct pathfinding, prototyping, and productization of 3D sensing solutions. Drive the definition and iteration of camera and depth system architecture and roadmap through theoretical modeling, end-to-end simulation, and experiential prototyping.
- Shipped or contributed to multiple 0-to-1 MR features on Quest Pro and Quest 3/3S. Incubate and prototype algorithms and features on Meta's Wearable line of products including Ray-Ban Meta and undisclosed future devices.

University of British Columbia, Vancouver, BC — Sept. 2013 - May 2018

Research Assistant at Imager Lab. Advisor: Prof. Wolfgang Heidrich
- Designed optimization methods for solving inverse problems in vision and graphics.
- Derived image formation models for consumer and scientific imagers and optics.
- Presented research publications at CVPR 2015-2018.

Stanford University, Stanford, CA — Feb. 2017 - Mar. 2017

Visiting Researcher at Computational Imaging Lab. Advisor: Prof. Gordon Wetzstein
- Initiated project on learning depth and material from time-of-flight measurements.
- Devised adversarial and depth-tailored deep learning architectures.
- Presented research outcome at Stanford SCIEN affiliated workshops.

Adobe Research, Seattle, WA — Mar. 2016 - July 2016

Research Intern at Creative Technologies Lab. Advisors: Dr. Oliver Wang, Dr. Jue Wang
- Developed deep learning frameworks for video deblurring.
- Shipped the Camera Shake Deblur effect to Adobe After Effects.
- Presented spotlight oral at CVPR 2017 and poster at ICCP 2017.

KAUST, Thuwal, Saudi Arabia — Oct. 2014 - Jan. 2015

Visiting Researcher at Visual Computing Center. Advisor: Prof. Wolfgang Heidrich
- Developed deconvolution algorithms utilizing sparse and cross-channel image priors.
- Applied the method to aberration correction in imaging through diffractive optical elements.

Tsinghua University, Beijing, China Feb. 2013 - June 2013
Research Assistant at State Key Lab of Intelligent Tech. & Sys. Advisor: Prof. Xiaolin Hu
- Devised and implemented a nonlinear feature quantization model based on sparse coding.
- Evaluated against image classification tasks on various datasets.

Microsoft Research, Beijing, China Sept. 2012 - Nov. 2012
Visiting Student at Internet Graphics Group. Advisor: Dr. Stephen Lin
- Developed techniques for robust shape-from-shading in the presence of textures.
- Designed an iterative 3D reconstruction framework leveraging defocus and shading cues.
- Presented at CVPR 2013 and TIP 2016.

Microsoft Research, Beijing, China Feb. 2012 - Sept. 2012
Software Engineering Intern at Innovation Engineering Group. Mentor: Mr. Xiao Liang
- Developed image blending and color calibration algorithms for Image Composite Editor.
- Shipped the image processing pipeline for Microsoft's Gigapixel Camera.
- Provided technology to Dunhuang Academy for cultural heritage digitization.

Education

University of British Columbia, Vancouver, BC Sept. 2013 - May 2018
Ph.D. in Computer Science
Thesis: Exploiting Temporal Structures in Computational Photography

Tsinghua University, Beijing, China Sept. 2009 - July 2013
B.Eng. in Computer Science
Thesis: Image Classification with Outer Product Features

Publications

Consistent Direct Time-of-Flight Video Depth Super-Resolution
Zhanghao Sun, Wei Ye, Jinhui Xiong, Gyeongmin Choe, Jialiang Wang, **Shuochen Su**, and Rakesh Ranjan
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023

Toward Practical Monocular Indoor Depth Estimation
Cho-Ying Wu, Jialiang Wang, Michael Hall, Ulrich Neumann, and **Shuochen Su**
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022

Deep End-to-End Time-of-Flight Depth Imaging
Shuochen Su, Felix Heide, Gordon Wetzstein, and Wolfgang Heidrich
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018

Deep Video Deblurring for Hand-held Cameras
Shuochen Su, Mauricio Delbracio, Jue Wang, Guillermo Sapiro, Wolfgang Heidrich, and Oliver Wang
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017
(Spotlight presentation, acceptance rate 5.5%)

Material Classification Using Raw Time-of-Flight Measurements
Shuochen Su, Felix Heide, Robin Swanson, Jonathan Klein, Clara Callenberg, Matthias Hullin, and Wolfgang Heidrich
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016

Rolling Shutter Motion Deblurring
Shuochen Su and Wolfgang Heidrich
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015

Bayesian Depth-from-Defocus with Shading Constraints
Chen Li, **Shuochen Su**, Yasuyuki Matsushita, Kun Zhou, and Stephen Lin
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2013

Bayesian Depth-from-Defocus with Shading Constraints
Chen Li, **Shuochen Su**, Yasuyuki Matsushita, Kun Zhou, and Stephen Lin
IEEE Transactions on Image Processing (TIP), 2016

Computational Imaging Using Lightweight Diffractive-refractive Optics
Yifan Peng, Qiang Fu, Hadi Amata, **Shuochen Su**, Felix Heide, and Wolfgang Heidrich
Optics Express, 2015

Modeling Outer Products of Features for Image Classification
Peng Qi, **Shuochen Su**, and Xiaolin Hu
IEEE International Conference on Advanced Computational Intelligence, 2013

PATENTS

12 U.S. patents granted: 11,195,291, 11,182,914, 11,010,911, 10,972,715, 10,929,997, 10,755,173, 10,534,998, 10,289,951
4 U.S. patents pending: 17/504,004, 17/074,495, 17/069,709, 17/230,109, 17/138,537, 17/329,888

PROFESSIONAL ACTIVITIES

Program Committee, CVPR, ICCV, ECCV, ACCV, 3DV
Reviewer, WACV, ICLR, NeurIPS, SIGGRAPH Asia, EG, TOG, TPAMI, TIP, TCI, SPL, PR, CGF, OE, NEUCOM, SPIC etc.
Membership, IEEE, ACM SIGGRAPH

AWARDS

SCIEN 2017 Distinguished Poster Award, Stanford University, 2017
CVPR 2017 Outstanding Reviewer Award, IEEE, 2017
Graduate Student Travel Award, UBC, 2017
Faculty of Science Graduate Award, UBC, 2014-17
Award of Excellence, Microsoft Research Asia, 2013

REFERENCES

Available upon request.

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