Shuochen Su

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

SPECIALIZATION, SKILLS, AND IMPACT	*Specialization* - 3D vision and graphics, depth estimation, scene reconstruction, view synthesis - Low-level vision, image and video processing, computational photography and imaging - Machine learning and optimization *Skills* - Design, build, and operate large SW/HW systems - Product direction, metrics design, business tradeoffs, prioritization - Communication, conflict resolution, high stake escalation, team building and coaching *Impact* - Proven track record of defining and shipping 0-to-1 products and features in the domains of Augmented & Mixed Reality, Wearables, 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 at Cameras and Depth Group.
- Research and development of CV and ML algorithms for machine perception, photographic imaging, and contextual AI.
- Grow, manage, and lead a team of researchers, engineers, and prototypers to conduct pathfinding, rapid prototyping, downselection, and productization of 3D sensing solutions. Drive the definition and iteration of camera and depth system architecture and roadmaps across MR, AR, and Wearables through theoretical modeling, SW/HW co-design, end-to-end simulation, and experiential prototyping.
- Shipped multiple 0-to-1 MR and AR features on Quest Pro, Quest 3/3S, and Orion. Define, incubate, and prototype experiences and algorithms 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.
- 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.
- 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.
- 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.

- 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.
- Devised and implemented a nonlinear feature quantization model based on sparse coding.
- Evaluated against image classification tasks on various datasets.

Microsoft Research, Beijing, China   Feb. 2012 - Nov. 2012

Visiting Student at Internet Graphics Group.
- Developed techniques for robust shape-from-shading in the presence of textures.
- Designed an iterative 3D reconstruction framework leveraging defocus and shading cues.
- Presented research outcome at CVPR 2013 and TIP 2016.

Software Engineering Intern at Innovation Engineering Group.
- Developed image blending and color calibration algorithms for Image Composite Editor.
- Shipped the image processing pipeline for Microsoft's Gigapixel Camera.
- Delivered technology to Dunhuang Academy for cultural heritage digitization.

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

Tsinghua University, Beijing, China   Sept. 2009 - July 2013
B.Eng. in Computer Science. Advisor: Prof. Xiaolin Hu
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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