Qi Sun

November 2, 2024

http://www.qisun.me

qisun@nyu.edu

EDUCATION	
Doctor of Philosophy Computer Science, Stony Brook University, Stony Brook, NY Advisor: Distinguished Professor Arie Kaufman Dissertation: Computational Methods for Immersive Perception Q IEEE VR 2019 Best Dissertation Award	08/2013 - 05/2018
Bachelor of Science Mathematics, Taishan Honors College, Shandong University, China Computer Science, Shandong University, China	08/2013 10/2010 - 08/2013 09/2009 - 10/2010
EMPLOYMENT	
Assistant Professor Tandon School of Engineering, New York University	01/2021 -
Research Scientist Adobe Research, San Jose, CA	06/2018 - 01/2021
Research Intern Adobe Research, Procedural Imaging Group, San Jose, CA	07/2017 - 09/2017
Research Intern NVIDIA Research, New Experiences Group, Redmond, WA	04/2017 - 07/2017
Research Intern NVIDIA Research, New Experiences Group, Santa Clara, CA	06/2016 - 08/2016
Research Intern Microsoft Research Asia, Hardware Computing Group, Beijing, China	11/2012 - 02/2013
AWARDS AND HONORS	
ACM SAP 2024 Best Paper Award ACM SAP 2024 Best Presentation Award SIGGRAPH 2024 Best Paper Honorable Mention Award NYU Tandon Junior Faculty Research Award NYU Goddard Junior Faculty Fellowship Award SONY Focused Faculty Research Award IEEE VR 2024 Best Paper Honorable Mention Award IEEE VIS 2023 Best Paper Honorable Mention Award SIGGRAPH 2022 Best Paper Award SIGGRAPH 2022 Best Paper Honorable Mention Award ISMAR 2022 Best Journal Paper Award NVIDIA Applied Research Accelerator Award IEEE VR Best Dissertation Award Stony Brook Computer Science Special Chair Fellowship	2024 2024 2024 2024 2024 2024 2024 2023 2022 2022

STUDENT AWARDS

Budmonde Duinkharjav 1. Deborah Rosenthal, MD Award: NYU Outstanding Performance on PhD Qualification 2022 2. Snap Research Fellowship Honorable Mention 2022 Yunxiang Zhang 1. Deborah Rosenthal, MD Award: NYU Outstanding Performance on PhD Qualification 2024

FULL PUBLICATIONS

Refereed Journal

- 24. Evaluating Visual Perception of Object Motion in Dynamic Environments Budmonde Duinkharjav, Jenna Kang, Gavin Miller, Chang Xiao, Qi Sun ACM Transactions on Graphics (SIGGRAPH Asia 2024)
- 23. PEA-PODs: Perceptual Evaluation Of Algorithms For Power Optimization In XR Displays

[Best Paper Honorable Mention Award] Kenneth Chen, Thomas Wan, Nathan Matsuda, Ajit Ninan, Alexandre Chapiro*, Qi Sun*

ACM Transactions on Graphics (SIGGRAPH 2024)

- 21. Measuring and Predicting Multisensory Reaction Latency: A Probabilistic Model for Visual-Auditory Integration

Xi Peng, Yunxiang Zhang, Daniel Jiménez-Navarro, Ana Serrano, Karol Myszkowski, Qi Sun IEEE Transactions on Visualization and Computer Graphics (IEEE ISMAR) 2024

20. **Q** Modeling The Impact Of Head-Body Rotations On Audio-Visual Spatial Perception For Virtual Reality Applications

[Best Paper Honorable Mention Award] Edurne Bernal-Berdun, Mateo Vallejo, Qi Sun, Ana Serrano, Diego Gutierrez

IEEE Transactions on Visualization and Computer Graphics (IEEE VR) 2024

19. A Visual Analytics Tool to Explore Human Behaviour based on fNIRS in AR guidance systems

Sonia Castelo, Joao Rulff, Parikshit Solunke, Erin McGowan, Guande Wu, Iran Roman, Roque Lopez, Bea Steers, **Qi Sun**, Juan Bello, Bradley Feest, Michael Middleton, Ryan Mckendrick, Claudio Silva

IEEE Transactions on Visualization and Computer Graphics (IEEE VIS) 2024

18. The Shortest Route Is Not Always the Fastest: Probability-Modeled Stereoscopic Eye Movement Completion Time in VR

Budmonde Duinkharjav, **Benjamin Liang**, Rachel Brown, Anjul Patney, **Qi Sun** ACM Transactions on Graphics (SIGGRPAH Asia 2023)

17. **Q** ARGUS: Visualization Of Al-Assisted Task Guidance In AR S.C. Quispe, J. Rulff, E. McGowan, B. Steers, G. Wu, S. Chen, I. Roman, R. Lopez, E. Brewer,

^{**}marked my students and myself in bold

- C. Zhao, J. Qian, K. Cho, H. He, **Q. Sun**, H. Vo, J.P. Bello, M. Krone, C. Silva **[Best Paper Honorable Mention Award]** IEEE Transactions on Visualization and Computer Graphics (VIS 2023)
- Reconstructing Room Scales with a Single Sound for Augmented Reality Displays Benjamin Liang, Andrew Liang, Iran Roman, Tomer Weiss, Budmonde Duinkharjav, JP Bello, Qi Sun Journal of Information Display 24.1 (2023)
- 15. Color-Perception-Guided Display Power Reduction For Virtual Reality
 Budmonde Duinkharjav*, Kenneth Chen*, Abhishek Tyagi, Jiayi He, Yuhao Zhu, Qi Sun
 ACM Transactions on Graphics (TOG) 41.6 (2022): 1-16. (SIGGRPAH Asia 2022)
- 14. Force-Aware Interface Via Electromyography For Natural VR/AR Interaction Yunxiang Zhang, Benjamin Liang, Boyuan Chen, Paul Torrens, S. Farokh Atashzar, Dahua Lin, Qi Sun

ACM Transactions on Graphics (TOG) 41.6 (2022): 1-18. (SIGGRPAH Asia 2022)

- 13. **Q** FoV-NeRF: Foveated Neural Radiance Fields For Virtual Reality
 Nianchen Deng, Zhenyi He, Jiannan Ye, Budmonde Duinkharjav, Praneeth Chakravarthula,
 Xubo Yang, Qi Sun
 [Best Journal Paper Award] IEEE Transactions on Visualization and Computer Graphics 28.11
 (2022): 3854-3864 (Proceedings of ISMAR) 2022
- Image Features Influence Reaction Time: A Learned Probabilistic Perceptual Model For Saccade Latency Budmonde Duinkharjav, Praneeth Chakravarthula, Rachel Brown, Anjul Patney, Qi Sun [Best Paper Award] ACM Transactions on Graphics (TOG) 41.4 (2022): 1-15. (SIGGRPAH 2022)
- 11. **Q** Joint Neural Phase Retrieval And Compression For Energy- And Computation-Efficient Holography On The Edge

Yujie Wang, Praneeth Chakravarthula, **Qi Sun**, Baoquan Chen **[Best Paper Honorable Mention Award]** ACM Transactions on Graphics (TOG) 41.4 (2022): 1-16. (SIGGRPAH 2022)

10. Larger Visual Changes Compress Time: The Inverted Effect of Asemantic Visual Features on Interval Time Perception

Sandra Malpica, Belen Masia, Laura Herman, Gordon Wetzstein, David Eagleman, Diego Gutierrez, Zoya Bylinskii, **Qi Sun** PloS one 17, no. 3 (2022)

9. Instant Reality: Gaze-Contingent Perceptual Optimization For 3D Virtual Reality Streaming

Shaoyu Chen, **Budmonde Duinkharjav**, Xin Sun, Li-Yi Wei, Stefano Petrangeli, Jose Echevarria, Claudio Silva, **Qi Sun**

IEEE Transactions on Visualization and Computer Graphics 28.5 (2022)

8. Leveraging Human Visual Perception For An Optimized Virtual Reality Experience Qi Sun

IEEE Computer Graphics and Applications 41.6 (2021): 164-170.

7. Gaze-Contingent Retinal Speckle Suppression For Holographic Displays

Praneeth Chakravarthula, Zhan Zhang, Okan Tarhan Tursun, Piotr Didyk, **Q. Sun**, Henry Fuchs IEEE Transactions on Visualization and Computer Graphics 27.11 (2021): 4194-4203. (Proceedings of ISMAR)

6. **Tailored Reality: Perception-Aware Scene Restructuring For Adaptive VR Navigation** Zhi-Chao Dong, Wenming Wu, Zenghao Xu, **Q. Sun**, Guanjie Yuan, Ligang Liu, Xiao-Ming Fu

Pre-NYU

5. Eccentricity Effects on Blur and Depth Perception

Qi Sun, Fu-Chung Huang, Li-Yi Wei, David Luebke, Arie Kaufman, Joohwan Kim Optics Express Vol. 28 No. 5, 2020

4. Reducing Simulator Sickness with Perceptual Camera Control

Ping Hu, **Qi Sun**, Piotr Didyk, Li-Yi Wei, Arie Kaufman ACM Transactions on Graphics (SIGGRAPH Asia 2019)

3. Towards Virtual Reality Infinite Walking: Dynamic Saccadic Redirection

Qi Sun, Anjul Patney, Li-Yi Wei, Omer Shapira, Jingwan Lu, Paul Asente, Suwen Zhu, Morgan McGuire, David Luebke, Arie Kaufman

ACM Transactions on Graphics (SIGGRAPH 2018) [BBC interview]

2. Perceptually-Guided Foveation for Light Field Displays

Qi Sun, Fu-Chung Huang, Joohwan Kim, Li-Yi Wei, David Luebke, Arie Kaufman ACM Transactions on Graphics (SIGGRAPH Asia 2017)

1. Mapping Virtual and Physical Reality

Qi Sun, Li-Yi Wei, Arie Kaufman

ACM Transactions on Graphics (SIGGRAPH 2016)

Refereed Conference

18. Accelerating Saccadic Response Through Spatial And Temporal Cross-Modal Misalignments

Daniel Jiménez Navarro, **Xi Peng**, **Yunxiang Zhang**, Karol Myszkowski, Hans-Peter Seidel, **Qi Sun**, Ana Serrano

ACM SIGGRAPH 2024 Conference Proceedings

17. May the Force Be with You: Dexterous Finger Force-Aware XR Interface Fengze Zhang*, Yunxiang Zhang*, Xi Peng, Sky Achitoff, Paul Torrens, Qi Sun IEEE ISMAR 2024

16. Toward User-Aware Interactive Virtual Agents: Generative Multi-Modal Avatar Behaviors in VR

Bhasura Gunawardhana, **Yunxiang Zhang**, **Qi Sun**, Zhigang Deng IEEE ISMAR 2024

15. Exploiting Human Color Discrimination For Memory- And Energy-Efficient Image Encoding In Virtual Reality

Nisarg Ujjainkar, Ethan Shahan, **Budmonde Duinkharjav**, **Kenneth Chen**, **Qi Sun**, Yuhao Zhu ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2024)

14. Imperceptible Color Modulation For Power Saving In VR/AR

Kenneth Chen, **Budmonde Duinkharjav**, Nisarg Ujjainkar, Ethan Shahan, Abhishek Tyagi, Jiayi He, Yuhao Zhu, **Qi Sun** ACM SIGGRAPH 2023 Emerging Technologies (SIGGRAPH '23). Article 8, 1–2.

13. Toward Optimized VR/AR Ergonomics: Modeling And Predicting User Neck Muscle Contraction

Yunxiang Zhang, Kenneth Chen, Qi Sun

ACM SIGGRAPH 2023 Conference Proceedings (pp. 1-12)

12. Dually Noted: Layout-Aware Annotations With Smartphone Augmented Reality

Jing Qian, Qi Sun, Curtis Wigington, Han Han, Tong Sun, Jennifer Healey, James Tompkin, Jeff Huang

Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems, pp. 1-15. 2022

11. Modeling And Optimizing Human-In-The-Loop Visual Perception Using Immersive Displays: A Review

Qi Sun, Budmonde Duinkharjav, Anjul Patney

SID Symposium Digest of Technical Papers (Vol. 53, No. 1, pp. 190-193)

Pre-NYU

10. Has Half the Time Passed? Investigating Time Perception at Long Scales

Sandra Malpica, Belen Masia, Laura Herman, Gordon Wetzstein, David Eagleman, Diego Gutierrez, Zoya Bylinskii, **Qi Sun**

Vision Science Society 2020

9. Deep Multi Depth Panoramas for View Synthesis

K. Lin, Z. Xu, B., P. Srinivasan, Y. Hold-Geoffroy, S. DiVerdi, **Q. Sun**, K. Sunkavalli, R. Ramamoorthi

European Conference on Computer Vision (ECCV) 2020

8. DiffTaichi: Differentiable Programming for Physical Simulation

Yuanming Hu, Luke Anderson, Tzu-Mao Li, **Qi Sun**, Nathan Carr, Jonathan Ragan-Kelley, Frédo Durand

International Conference on Learning Representations (ICLR) 2020

7. Learning to Reconstruct 3D Manhattan Wireframes from a Single Image

Yichao Zhou, Haozhi Qi, Simon Zhai, **Qi Sun**, Zhili Chen, Li-Yi Wei, Yi Ma International Conference on Computer Vision (ICCV) 2019 (Oral Presentation)

6. A Transparent Display with Per-Pixel Color and Opacity Control

TJ Rhodes, Gavin Miller, **Qi Sun**, Daichi Ito, Li-Yi Wei SIGGRAPH 2019 Emerging Technologies

5. Benefits of 3D Immersion for Virtual Colonoscopy

Koosha Mirhosseini, **Qi Sun**, Krishna Gurijala, Bireswar Laha, Arie Kaufman IEEE Visualization Workshop on 3DVis 2014

4. Data-Driven Human Motion Synthesis Based on Angular Momentum Analysis

Ping Hu, **Qi Sun**, Xiangxu Meng, and Jingliang Peng

IEEE International Symposium on Circuits and Systems, ISCAS 2013

3. Modeling 3D Faces from Samplings via Compressive Sensing

Qi Sun, Yanlong Tang, and Ping Hu

International Conference on Digital Image Processing, 2013

2. Kinect-Based Automatic 3D High-Resolution Face Modeling

Qi Sun, Yanlong Tang, Ping Hu, and Jingliang Peng International Conference on Image Analysis and Signal Processing 2012

1. Buyers Satisfaction in A Virtual Fitting Room Scenario Based on Realism of Avatar

Qi Sun, Seyedkoosha Mirhosseini, levgeniia Gutenko, Ji Hwan Park, Charilaos Papadopoulos, Bireswar Laha, Arie Kaufman

IEEE Symposium on 3D User Interfaces, 3DUI 2015

Book Chapters

1 Real VR: Digital Immersive Reality

Springer Lecture Notes in Computer Science 2020 (Dagstuhl Book Chapter)

SOFTWARE CREDITS

Adobe Dimension

GRANTED PATENTS

Sharing of user markings between printed and digital documents

Tong Sun, Qi Sun, Jing Qian, CM Wigington US11520974B2, granted 2022-12-06

Classifying panoramic images

Qi Sun, Li-Yi Wei, Joon-Young Lee, Jonathan Eisenmann, Jinwoong Jung, Byungmoon Kim US10991085B2, granted 2021-04-27

Dynamic mapping of virtual and physical interactions

Qi Sun, Paul John Asente, Li-Yi Wei, Jingwan Lu US10957103B2, granted 2021-03-23

Controlling an augmented reality display with transparency control using multiple sets of video buffers

Tenell Glen Rhodes Jr, Gavin Stuart Peter Miller, Li-Yi Wei, Qi Sun US10847117, granted 2020-11-24

Saccadic redirection for virtual reality locomotion

Qi Sun, Anjul Patney, Omer Shapira, Morgan McGuire, Aaron Lefohn, David Luebke US10573061B2, granted 2020-02-25

Path planning for virtual reality locomotion

Qi Sun, Anjul Patney, Omer Shapira, Morgan McGuire, Aaron Lefohn, David Luebke US10573071B2, granted 2020-02-25

Adjusting an Angular Sampling Rate during Rendering Utilizing Gaze Information

Qi Sun, Fu-Chung Huang, Joohwan Kim and David Luebke US10395624B2, granted 2019-08-27

System and Method for Generating a Progressive Representation Associated with Surjectively Mapped Virtual and Physical Reality Image Data

KEYNOTE AND DISTINGUISHED TALKS

Voice of XR	
University of Rochester	2024
Toward Human-Centered XR: Bridging Cognition and Computation	
ACM Symposium on Applied Perception	2024
CMU VACS	2024
Human-Centric Optical Designs and Architectures	
Plenary Panel: SPIE Photonics West	2024
Co-Optimizing Human-System Performance in XR	
36th Conference on Graphics, Patterns and Images (SIBGRAPI)	2023
University of Houston	2022
Digital Twins: New Frontiers Today	
MIT Horizon Podcast	2022

SELECTED PRESS/MEDIA

Image Features Influence Reaction Time.

ACM SIGGRAPH, EurekAlert!, NVIDIA Developer Blog, etc.

Adobe Glasswing Transparent Display.

The Verge, CNET, Axios, Next Reality, Printed Electronics World, TechHQ etc.

Towards Virtual Reality Infinite Walking.

BBC News (personal interview), SIGGRAPH blog, IEEE, Adobe News, NVIDIA Blog, Two Minute Papers, Stony Brook News, Road to VR, Hackaday, VR Focus, VR World, Inverse, ScienceDaily, eurekAlert, newsAtlas, Sohu.com (Chinese), RedShark News, VR Soldier, Stylus, InAVate, 4gamer (Japanese) Virtual Reality Magazine (German), Microsiervos (Spanish) etc.

Mapping Virtual and Physical Reality.

SIGGRAPH Technical Papers Preview, Business Wire, Seamless Virtual Reality News (Japanese), leiphone.com/sina.cn etc. (Chinese), Tencent gameinstitute, Game II DOOSAN Gallery New York.

Perceptually-Guided Foveation for Light Field Displays.

Road to VR, Seamless Virtual Reality News (Japanese).

PUBLIC EDUCATION

- 2. Effective User Studies in Computer Graphics Eurographics 2023
- Visual Computing for Computer Architect ASPLOS 2023

NYU COURSES

- 2. Fall 2021 & Spring 2022 & Spring 2023 CS-GY 6313 Information Visualization
- 1. Fall 2022 & Fall 2023 CS-GY 9223 Virtual and Augmented Reality

POSTDOCTORAL RESEARCHERS

Niall Williams, CSE Faculty Fellow, 2024 Fall-Zhaoxi Zhang, CUSP Faculty Fellow, 2023 Fall-

GRADUATE ADVISEES

Budmonde Duinkharjav, PhD student at NYU, 2021 Spring-

Yunxiang Zhang, PhD student at NYU, 2022 Fall-

Kenneth Chen, PhD student (previously MSc) at NYU, 2023 Fall-

Jenna Kang, PhD student at NYU, 2024 Fall-

Bingxuan Li, PhD student at NYU, 2024 Fall-

Brian Wu, current MSc Student at NYU, 2022 Fall-

Luigia Than, current MSc Student at NYU, 2022 Fall-

Benjamin Liang, MSc student at NYU, 2022 Fall-

Qinchan Li, graduated MSc Thesis Student at NYU, 2021 Fall-2023 Spring

Xi Peng, graduated MSc Thesis Student at NYU, 2021 Fall-2023 Spring

Qin Ying Chen, graduated MSc Thesis Student at NYU, 2021 Spring-2023 Spring

Erica Chou, graduated MSc Thesis Student at NYU, 2021 Spring-2023 Spring

Edurne Bernal-Berdun, visiting PhD student from University of Zaragoza Rebeka Bojboi, Rabi visiting Scholar from Columbia University

PHD THESIS COMMITTEE

Zhenyi He, NYU Courant Karl Rosenberg, NYU Courant Ho-Hsiang Wu, NYU Steinhardt Shaoyu Chen, NYU Tandon Daniel Martin, University of Zaragoza Luca Surace, Università della Svizzera italiana

SERVICE

Editor	
Associate Editor, IEEE Transactions on Visualization and Computer Graphics (TVCG)	2023-
Associate Editor, ACM Transactions on Applied Perception	2023-
MDPI Applied Sciences Special Issue on "New Frontiers in Virtual Reality (VR) Systems"	2021
Frontiers in Virtual Reality on 'Virtual Reality for Telepresence'	2021
Chairing	
ACM Symposium on Applied Perception, Conference Chair	2023
IEEE VR, Publicity Chair	2023
IEEE ISMAR, Video and Registration Chair	2022
Conference Program Committee	
<u> </u>	24 - 2025
SIGGRAPH Asia	2023
ACM Annual Symposium on Computer Animation (SCA)	2023

Computer Graphics International (CGI)	2023 - 2024
IEEE VR	2023
IEEE VGTC VR Best Dissertation Award	2022-2023
ACM/SIGGRAPH conference on Motion, Interaction, and Games (MIG)	2022
Pacific Graphics	2022-2024
ACM Symposium on Applied Perception (SAP)	2022
Eurographics Symposium on Rendering	2022
IEEE ISMAR	2021-2024
ACM SIGGRAPH Asia XR and VR Theater	2020-2021
Grace Hopper Celebration (GHC)	2020,2023
ACM ETRA	2020-2021, 2023
ACM CHI Late-Breaking Works	2020-2021
ACM SIGGRAPH Asia Technical Briefs and Posters	2019
ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (i3D)	2019-2022, 2024
National Science Foundation (NSF) panelist	2020, 2021

Reviewer

ACM SIGGRAPH (Asia), Nature Scientific Reports, Optics Express, ACM CHI, IEEE Visualization, IEEE Transactions on Visualization and Computer Graphics, Computer Graphics Forum (CGF), ACM Transaction on Graphics (TOG), ACM User Interface Software and Technology (UIST), ACM VRST, ACM i3D, IEEE 3D User Interfaces (3DUI), IEEE VR [both Conference and Journal tracks], IEEE ISMAR, ACM Symposium on Applied Perception (SAP), ACM ETRA, IEEE Access, Wiley Computer Animation and Virtual Worlds, IEEE Consumer Electronics Magazine, IEEE Transactions on Emerging Topics in Computing, Virtual Reality Software and Technology (VRST), Springer Virtual Reality, MDPI Applied Sciences, The Visual Computer, Computer & Graphics.

Internal

NIVII ()raanizar K AIS I_NIVII Warkshan an Matavarsa	
NYU Organizer, KAIST-NYU workshop on Metaverse	2023
Faculty Search Committee, NYU Shanghai, Urban \times CS position	2023
Seminar Organizer, NYU CUSP Seminar Series	2023-2024
Committee Member, NYU CSE PhD Admission	2023-2024
Chair/Committee Member, NYU CUSP Fellowship program	2022-2023
Committee Member, NYU CUSP C-Faculty Committee	2023
Committee Member, NYU CSE Visiting Faculty	2023-2024
Committee Member, NYU CSE PhD Program	2021-
Co-Organizer, NYU CSE New PhD Student Welcome	2021
Mentor, NYU GLASS Program	2021
Mentor, NYU CUSP Capstone Project	2021-2022
NYU Center for Urban Science and Progress Faculty Fellowship search committee	2021-2022
Adobe Research PhD fellowship committee 20	2018 - 2019
Adobe Research Women-in-Technology Scholarship committee	2019