

Qi Sun

✉ qisun@nyu.edu

🌐 <http://www.qisun.me>

📅 November 2, 2024

EDUCATION

Doctor of Philosophy Computer Science, Stony Brook University, <i>Stony Brook, NY</i> Advisor: Distinguished Professor Arie Kaufman Dissertation: Computational Methods for Immersive Perception 🏆 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, <i>San Jose, CA</i>	07/2017 - 09/2017
Research Intern NVIDIA Research , New Experiences Group, <i>Redmond, WA</i>	04/2017 - 07/2017
Research Intern NVIDIA Research , New Experiences Group, <i>Santa Clara, CA</i>	06/2016 - 08/2016
Research Intern Microsoft Research Asia , Hardware Computing Group, <i>Beijing, China</i>	11/2012 - 02/2013

AWARDS AND HONORS

ACM SAP 2024 Best Paper Award	2024
ACM SAP 2024 Best Presentation Award	2024
SIGGRAPH 2024 Best Paper Honorable Mention Award	2024
NYU Tandon Junior Faculty Research Award	2024
NYU Goddard Junior Faculty Fellowship Award	2024
SONY Focused Faculty Research Award	2024
IEEE VR 2024 Best Paper Honorable Mention Award	2024
IEEE VIS 2023 Best Paper Honorable Mention Award	2023
SIGGRAPH 2022 Best Paper Award	2022
SIGGRAPH 2022 Best Paper Honorable Mention Award	2022
ISMAR 2022 Best Journal Paper Award	2022
NVIDIA Applied Research Accelerator Award	2022
IEEE VR Best Dissertation Award	2020
Stony Brook Computer Science Special Chair Fellowship	2013 - 2014

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

marked **my students and **myself** in bold

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)
22.  **GazeFusion: Saliency-guided Image Generation**
[Best Paper Award] **Yunxiang Zhang**, Nan Wu, Connor Lin, Gordon Wetzstein, **Qi Sun**
ACM Transactions on Applied Perception (Proceedings of ACM SAP 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.  **Modeling The Impact Of Head-Body Rotations On Audio-Visual Spatial Perception For Virtual Reality Applications**
[Best Paper Honorable Mention Award] Eurne Bernal-Berdun, Mateo Vallejo, **Qi Sun**, Ana Serrano, Diego Gutierrez
IEEE Transactions on Visualization and Computer Graphics (IEEE VR) 2024
19.  **HuBar: 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 (SIGGRAPH Asia 2023)
17.  **ARGUS: Visualization Of AI-Assisted Task Guidance In AR**
S.C. Quispe, J. Rulff, E. McGowan, B. Steers, G. Wu, S. Chen, I. Roman, R. Lopez, E. Brewer,

- 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)
16. **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.  **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
 12.  **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.  **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)
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- 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, Ievgeniia 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 Subjectively Mapped Virtual and Physical Reality Image Data

Arie Kaufman, **Qi Sun** and Li-Yi Wei
US10403043B2, granted 2019-09-03

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, eurekaAlert, 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

1. 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-
Qinchuan 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

Eduarne Bernal-Berdun, visiting PhD student from University of Zaragoza
Rebeka Bojboi, Rabi visitng 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

SIGGRAPH	2024 - 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

NYU Organizer, KAIST-NYU workshop on Metaverse	2023
Faculty Search Committee, NYU Shanghai, Urban x 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	2018 - 2019
Adobe Research Women-in-Technology Scholarship committee	2019