Budmonde Duinkharjav

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Education

New York University, Brooklyn, NY — *Spring 2021 - Spring 2025*
PhD in Computer Science
Advisor: Qi Sun
Thesis: Psychophysical Methods for Enhancing Immersive Graphics Systems

Massachusetts Institute of Technology, Cambridge, MA — *Fall 2014 - Spring 2019*
MEng in Computer Science and Engineering (Computer Graphics concentration)
Advisor: Frédo Durand
Thesis: Learning non-stationary SVBRDFs using GANs and Differentiable Rendering
BS in Computer Science and Engineering

Work Experience

NVIDIA, New York, NY - *Machine Learning Engineer* — *Fall 2025 - present*
AI for Gaming and Graphics, DLSS, Image/Video Quality

NVIDIA, New York, NY - *Machine Learning Engineering Intern* — *Summer 2024*
Human Performance and Experience, Video Quality Assessment

Adobe Research, San Jose, CA - *Research Intern* — *Summer 2023*
Human Motion Perception and Estimation (see SIGGRAPH Asia 2024 paper)

NVIDIA Research, New York, NY - *Research Intern* — *Summer 2022*
Human Performance and Experience, Image Feature Statistics, Image Quality Assessment

Facebook, Seattle, WA - *Software Engineer* — *Fall 2019 - Spring 2021*
Java Byte-code Optimization for Android (see Redex), Performance Guided Optimization

MIT, CSAIL, Cambridge, MA - *Research Assistant* — *Fall 2017 - Spring 2019*
Differentiable Rendering, Generative Adversarial Models, Learning Surface Textures from Images
Large Scale Procedural 3D Scene Generation

Facebook, Menlo Park, CA - *Software Engineering Intern* — *Summer 2018*

Instagram, Menlo Park, CA - *Software Engineering Intern* — *Summer 2017*

Omron R&D, Kyoto, Japan - *Research Intern* — *Summer 2016*
Computer Vision, LIDAR Imaging Spatial Upsampling

MIT, Civil&Environ. Eng. Dept., Cambridge, MA - *Research Assistant* — *Fall 2014 - Spring 2015*
Fluid Mechanics, Fluid Droplet Collisions on Flat Surfaces,

Journal and Conference Publications

FovealNet: Advancing AI-Driven Gaze Tracking Solutions for Efficient Foveated Rendering in Virtual Reality — *IEEE VR 2025*
*W. Liu, **B. Duinkharjav**, Q. Sun, S. Q. Zhang*

Evaluating Visual Perception of Object Motion in Dynamic Environments — *SIGGRAPH Asia 2024*
***B. Duinkharjav**, J. Kang, G. S. P. Miller, C. Xiao, Q. Sun*

Exploiting Human Color Discrimination for Memory- and Energy-Efficient Image Encoding in Virtual Reality *ASPLOS 2024*
*N. Ujjainkar, E. Shahan, K. Chen, **B. Duinkharjav**, Q. Sun, Y. Zhu*

The Shortest Route Is Not Always the Fastest: Probability-Modeled Stereoscopic Eye Movement Completion Time in VR *SIGGRAPH Asia 2023*
***B. Duinkharjav**, B. Liang, A. Patney, R. Brown, Q. Sun*

Color-Perception-Guided Display Power Reduction for Virtual Reality *SIGGRAPH Asia 2022*
B. Duinkharjav, *K. Chen*, *A. Tyagi, J. He, Y. Zhu, Q. Sun (* co-authors)*

Reconstructing Room Scales With a Single Sound for Augmented Reality Displays *JID 2022*
*B. Liang, A. Liang, I. Roman, T. Weiss, **B. Duinkharjav**, J. P. Bello, Q. Sun*

FoV-NeRF: Foveated Neural Radiance Fields for Virtual Reality **Best Journal Paper at** *ISMAR 2022*
*N. Deng, Z. He, J. Ye, **B. Duinkharjav**, P. Chakravarthula, X. Yang, Q. Sun*

Image Features Influence Reaction Time: A Learned Probabilistic Perceptual Model for Saccade Latency **Best Paper at** *SIGGRAPH 2022*
***B. Duinkharjav**, R. Brown, P. Chakravarthula, A. Patney, Q. Sun*

Instant Reality: Gaze-Contingent Perceptual Optimization for 3D Virtual Reality Streaming *IEEE VR 2022*
*S. Chen, **B. Duinkharjav**, X. Sun, L. Wei, S. Petrangeli, J. Echevarria, C. Silva, Q. Sun*

Other Publications

Imperceptible Color Modulation for Power Saving in VR/AR *E-Tech at SIGGRAPH 2023*
*K. Chen, **B. Duinkharjav**, N. Ujjainkar, E. Shahan, A. Tyagi, J. He, Y. Zhu, Q. Sun*

Modeling And Optimizing Human-In-The-Loop Visual Perception Using Immersive Displays: A Review *SID Display Week 2022*
*Q. Sun, **B. Duinkharjav**, A. Patney*

Learning Non-stationary SVBRDFs using GANs and Differentiable Rendering *MIT M.Eng Thesis 2019*
B. Duinkharjav

Professional Services

Program Committee for ACM SAP
Reviewer for ACM { SIGGRAPH | SIGGRAPH Asia | SIGCHI }, IEEE { TVCG | ISMAR | VR }, Eurographics, Journal of Real-time Image Processing, IET, Displays

Awards

NYU Outstanding Performance on PhD QE, *Deborah Rosenthal, MD* Award *Spring 2023*

Snap Research Fellowship, 2022, Honorable Mention *Fall 2022*

ACM SIGGRAPH 2022, Best Paper Award *Summer 2022*

MIT Intro to Computer Graphics Final Project, Best Project Honorable Mention *Fall 2017*

MIT Web Programming Competition, 1st Place *Winter 2015*

45th International Physics Olympiad, Silver Medal *Summer 2014*

14th Asian Physics Olympiad, Bronze Medal *Spring 2014*

44th International Physics Olympiad, Bronze Medal *Summer 2013*

Teaching Experience

Virtual and Augmented Reality (CS-GY 9223), NYU, Brooklyn, NY - *Guest Lecturer* *Fall 2023, '24*
I taught an introduction to using the *Unity Engine* for game development and led a workshop.

Digital and Computational Photography (6.815), MIT, Cambridge, MA - *Teaching Assistant* *Spring 2019*
Graduate course popular for students focusing in computer graphics, computer vision, and HCI.
Topics: Image denoising, demosaicing, stitching, and blending. HDR and panorama photography.
Introduces the *HALIDE* language for high-performance image processing.
I helped develop some homework assignments, held office hours, and graded assignments.

Computer Systems Security (6.858), MIT, Cambridge, MA - *Teaching Assistant* *Spring 2018*
Graduate course popular for students focusing in computer systems.
Topics: OS security, capabilities, language security, security in web applications and more.
I held office hours, and graded assignments and final projects.

WebLab: Intro to Web Programming (6.148), MIT, Cambridge, MA - *Co-Instructor* *Winter 2016, '17, '18*
Introduces undergraduate students on how to build a dynamic web application with a server backend.
Course culminates in a competition for the best final project. Course website: `weblab.mit.edu`
I organized the course content and provided technical and creative feedback for student projects.