Budmonde Duinkharjav

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Education

New York University, Brooklyn, NY   *Spring 2021 - present*
  PhD Candidate in Computer Science
    Advisor: Qi Sun

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

Work Experience

Adobe Research, San Jose, CA - *Research Intern*   *Summer 2023*
  Currently working on a project to be submitted to SIGGRAPH 2024.

NVIDIA Research, Santa Clara, CA - *Research Intern*   *Summer 2022*
  Developed a perceptually-based image quality assessment metric for video game applications.

Facebook, Seattle, WA - *Software Engineer*   *Fall 2019 - Spring 2021*
  Researched and maintained profile-guided optimizations for Facebook's mobile apps.
  Contributed to Redex, the java byte-code optimizer for Android apps.

MIT, CSAIL, Cambridge, MA - *Research Assistant*   *Fall 2017 - Spring 2019*
  Developed a deep learning system for inferring surface textures using differentiable rendering.
  Worked on a system for procedural generation of large-scale city landscape 3D models.

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*
  Worked on super-resolution techniques applied on LIDAR scan images.

MIT, Civil&Environ. Eng. Dept., Cambridge, MA - *Research Assistant*   *Fall 2014 - Spring 2015*
  Analyzed the fluid behavior of water droplet collisions on flat surfaces.

Journal and Conference Publications

Numerically Lossy Perceptually Lossless Image Encoding For Memory-   *ASPLOS 2024*
and Energy-Efficient Mobile Virtual Reality   *(to appear)*
  N. Ujjainkar, E. Shahan, K. Chen, **B. Duinkharjav**, Q. Sun, Y. Zhu

The Shortest Route Is Not Always the Fastest: *SIGGRAPH Asia 2023*
Probability-Modeled Stereoscopic Eye Movement Completion Time in VR
  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: **Best Paper at** *SIGGRAPH 2022*
A Learned Probabilistic Perceptual Model for Saccade Latency
  ***B. Duinkharjav**, R. Brown, P. Chakravarthula, A. Patney, Q. Sun*

Instant Reality: Gaze-Contingent Perceptual Optimization   *IEEE VR 2022*
for 3D Virtual Reality Streaming
  *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   *SID Display Week 2022*
Using Immersive Displays: A Review
  *Q. Sun, **B. Duinkharjav**, A. Patney*

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

Teaching Experience

Virtual and Augmented Reality (CS-GY 9223), NYU, Brooklyn, NY - *Guest Lecturer*   *Fall 2023*
  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.

Professional Services

Reviewer for ACM { SIGGRAPH | SIGGRAPH Asia }, IEEE { ISMAR | VR }, Eurographics, IET

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, 1$^{\text{st}}$ Place   *Winter 2015*

45$^{\text{th}}$ International Physics Olympiad, Silver Medal   *Summer 2014*

14$^{\text{th}}$ Asian Physics Olympiad, Bronze Medal   *Spring 2014*

44$^{\text{th}}$ International Physics Olympiad, Bronze Medal   *Summer 2013*