Ryan Po

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PRINCIPAL INTERESTS

Computational imaging, computer graphics, computational photography, signal processing, physics-based rendering, computer vision, 3D sensing, optics.

ACADEMIC BACKGROUND

B.Sc. Computer Science — May 2022 (Expected)
Carnegie Mellon University, Pittsburgh, PA

- Concentration: Computer Graphics
- Research Advisor: Professor Ioannis Gkioulekas
- GPA: 3.90

EMPLOYMENT HISTORY

Research Assistant — Spring 2020 - Present
Carnegie Mellon University, Pittsburgh, PA

- Working with Prof. Ioannis Gkioulekas and Adithya Pediredla on improving accuracy of time-of-flight imaging using Single Photon Avalanche Diodes

Software Engineer Intern — Summer 2020
Riot Games, Santa Monica, CA

- Led back-end development of brand new module for tracking and alerting anomalies in incoming data for 10M+ daily players
- Refactored data storage system to handle previously leaky data streams, centralizing data streams from all of Riot's newly released titles

Software Engineer Intern — Summer 2019
Deloitte

- Led and produced a proof of concept for a Jockey Tracking interface for identifying jockeys during races
- Recognition and tracking algorithm trained based on YOLOv3, achieves $> 95\%$ accuracy with under 1 hour of training footage

PUBLICATIONS /PREPRINTS

- **Ryan Po**, Adithya Pediredla and Ioannis Gkioulekas, *Adaptive Gating for Single-Photon 3D Imaging*. *To appear in CVPR 2022 (Oral)*

PRESENTATIONS

- "Do we need gating for depth sensing with SPADs?", October 2021, NSF Expeditions Group
- "Adaptive gating for SPADs", September 2021, CMU Computational Imaging Reading Group
- "Optical Filtering Techniques for Improving SPAD Acquisition", December 2020, CMU Undergraduate Research Symposium

RESEARCH EXPERIENCE

Adaptive gating for SPADs through Thompson Sampling

- Updating SPAD gating position based on prior information on depth from previous SPAD cycles. Compensating for the pile-up effect under high ambient light conditions. Achieving $> 50\%$ decrease in RMSE and halving effective integration time. Manuscript in preparation for submission to CVPR 2022

– Presented work to NSF Expeditions group, as part of a $10 million grant for research into seeing below the skin

Periodic Attenuation and Gated SPAD with Priors

– Periodic modulation of SPAD attenuation and incorporating sinusoidal modulation into the inverse likelihood model of photon detection to compensate for pile-up.

– Presented work at undergraduate research symposium at CMU. Link to poster found here, write-up found here.

TEACHING EXPERIENCE

15-462 Computer Graphics Teaching Assistant *Spring 2021*

– Teaching assistant for course serving as intro to graphics covering topics such as rendering, animation, geometry, imaging and more

15-151 Mathematical Foundations for CS *Fall 2020*

– Led bi-weekly recitations, grading and creating course content for introductory course to discrete mathematics

HONORS & AWARDS

– HKSES Scholarship for Academic Excellence, USD$130,000 across 4 years for undergraduate studies.

– CMU Dean's List (All Semesters).

SERVICES

ICCP 2021 Student Volunteer

SELECTED COURSES

15-468 Physics-based Rendering	Spring 2021
16-385 Computer Vision	Spring 2020
15-462 Computer Graphics (TA)	Fall 2020 & Spring 2021 (TA)
15-468 Computational Photography	Fall 2020
15-464 Technical Animation	Spring 2021
10-315 Machine Learning	Fall 2020
15-151 Fundamentals of Math in CS (TA)	Fall 2018 & Fall 2019 (TA)
11-485 Deep Learning	Fall 2021
15-418 Parallel Computer Architecture	Fall 2021

SKILLS & LANGUAGES

Technical: Proficient in C/C++, Python, MATLAB, SML
Languages: Fluent in English, Cantonese, Mandarin