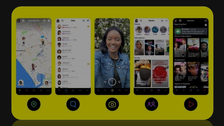
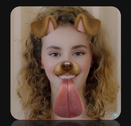




Please encourage your students to apply to our internship program!

Towards A Better Camera

Jian Wang

Snap Research

JUNE 18-22, 2023 CVPR VANCOUVER, CANADA

A Higher-Quality Camera

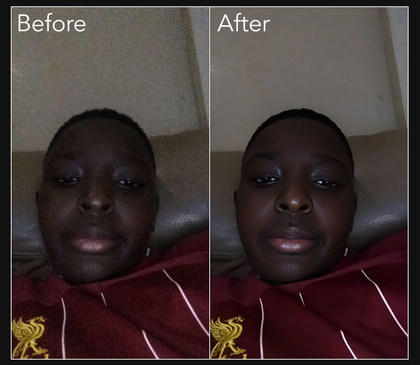
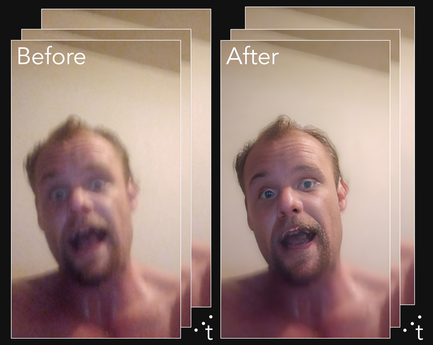


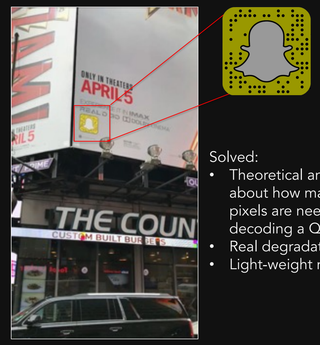
Image / Video Restoration

Challenges:

- Image/video quality assessment
- sRGB domain (not RAW)
- Real complicated degradations
- Fast (on low-end devices)
- Restoration vs. generation
- Inclusive
- Natural output



A Better SnapCode / QR code Scanner



Solved:

- Theoretical analysis about how many pixels are needed for decoding a QR code
- Real degradations
- Light-weight network

Image to 3D

Input

Outputs

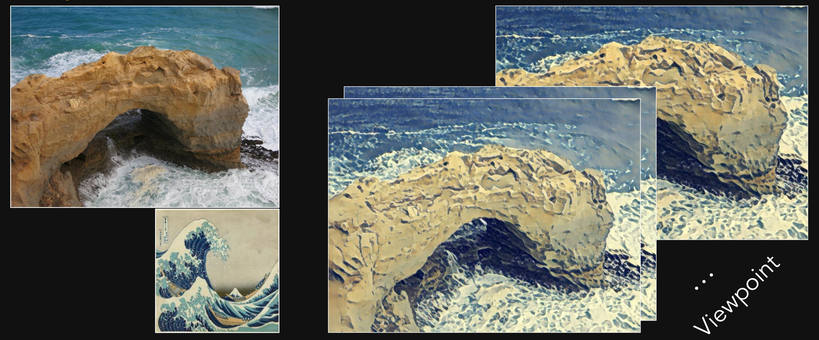
Serendipitous Scanning

Long Distance QR Code Decoding, US patent 22

QfaR: Location-Guided Scanning of Visual Codes from Long Distances, MobiCom 23

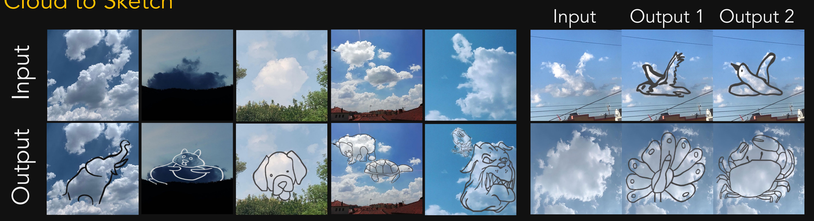
A More Interesting Camera

3D Stylized Photo



3D Photo Stylization: Learning to Generate Stylized Novel Views from a Single Image, CVPR 22 (oral)

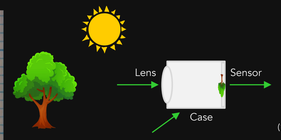
Cloud to Sketch

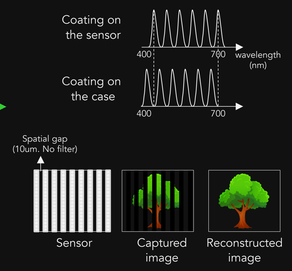


Cloud2Sketch: Augmenting Clouds with Imaginary Sketches, ACM MM 22

"Sci-fi" Research

Transparent Camera





Output (rendered)

Transparent fish

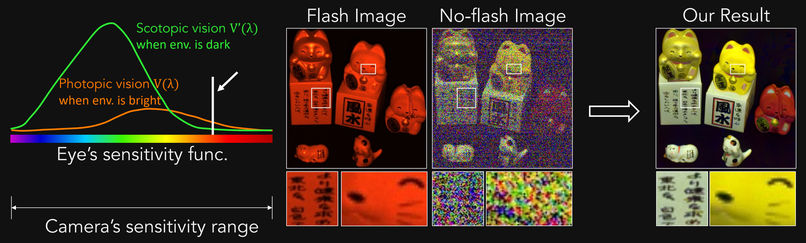
has evolved for 140 million years…

Transparent Camera, ICCP 22 Poster (best poster award)

New Hardware

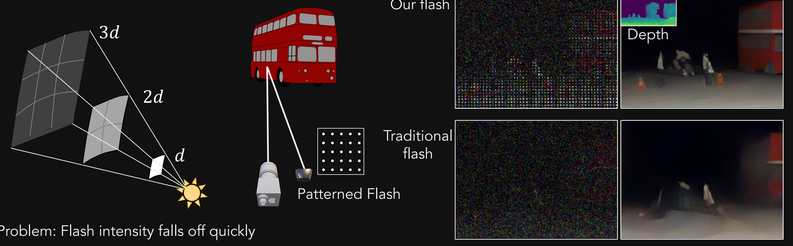
Low-light Imaging with A Flash

- Flash that is more comfortable to human eyes



Seeing in Extra Darkness Using a Deep-red Flash, CVPR 21 (oral)

- Flash that can see further



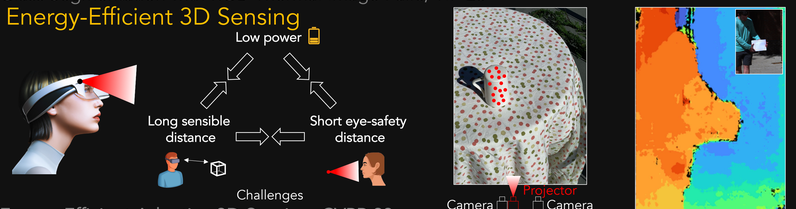
Problem: Flash intensity falls off quickly

Seeing Far in the Dark with Patterned Flash, ECCV 22

Glass Segmentation

Glass Segmentation with RGB-Thermal Image Pairs, TIP 23

Energy-Efficient 3D Sensing



Energy-Efficient Adaptive 3D Sensing, CVPR 23