CSCI 1290: Comp Photo

Fall 2018 @ Brown University
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Many slides thanks to James Hays’ old CS 129 course, along with all of its acknowledgements.
Final project class!
Procedure

• Teams allowed up to four
• Work *must* be commensurate with team size
• Each team gets a TA
• Proposal due soon
• Check in midway
• Presentation + report
• Do anything / use anything / go wild
Schedule

• 15\textsuperscript{th} Nov: Kick-off
• 21st Nov: Proposal (team + one page)
• 4\textsuperscript{th} Dec: Check in
• 11\textsuperscript{th} Dec \textit{or} 18\textsuperscript{th} Dec: Presentations
• 19\textsuperscript{th} Dec: Handin (four page(+) report; LaTeX)
Equipment (check out via me)

5x Canon t7i DSLR
   2x 18-55mm lenses
   2x 18-135mm lenses
   2x 55-250mm lenses
   1x 6.5mm fish-eye lens

2x 360 cameras
1x Lytro Illum light field camera
1x BigShot camera
3x Kinect v2 depth camera
2x AndroidThings platforms with cameras

   + polarizing filters, neutral density filters, gradient filters
   + smartphone lenses + filters

5x Manfrotto tripods
5x cheapo monopods
10x smartphone tripods
1x self-stabilizing smartphone mount

1x i1 Display Pro monitor colour calibrator
1x x-rite colour checker chart
Green screen + experiment space
Final Project: Your Choice

Valay Shah (2012): Natural Image Matting
Final Project: Your Choice

Ian Strickman (2012): Separation of Global and Direct Illumination using a Structure Light Projector
Final Project: Your Choice

Yan Li (2012): Non-photorealistic Rendering
Interactive Multi-perspective Imagery
Warp and composite
Final Project: your choice

You (2018): Probably some deep learning thing

[He et al. 2018]
Final Project: your choice

You (2018): Probably some deep learning thing

(a) Input image with detected face
(b) Person segmentation mask
(c) Mask + disparity from DP
(d) Our output synthetic shallow depth-of-field image

[Wadhwa et al. 2018]
Final Project: your choice
Take inspiration from research!
CompPhoto design challenge

• Split into groups

• Discuss current state of the art applications
  • 20 minutes
  • Do a little research!
  • ‘Back of the envelope’ calculations
    • what can you do on a smartphone? On a desktop? On the cloud?
  • 2 min presentation to class of your solution

• After that: We will generate ideas for final projects / discuss
1. Google Night Sight

Your smartphone photos are totally fake – and you love it

Night Sight on Google’s Pixel, which shoots pictures in the dark, shows how phone cameras have become faketastic.
2. Facebook’s 3D photos
3. Dynamic HDR

Bracketed exposures

Ghost-free HDR reconstruction
4. Superresolution

Right: Document-specific super-resolution; 2x and 3x magnification.
5. Colorization
Recap

1. Google Night Sight
2. Facebook 3D Photos
3. HDR in dynamic scenes
4. Superresolution (enhance!)
5. Colorization

2 min presentation (slides allowed!)