

# Computational Photography

- \* Study the basics of computation and its impact on the entire workflow of photography, from capturing, manipulating and collaborating on, and sharing photographs.



© 2014 Irfan Essa, Georgia Tech, All Rights Reserved

# What is Computational Photography? (Part 3 of 3)

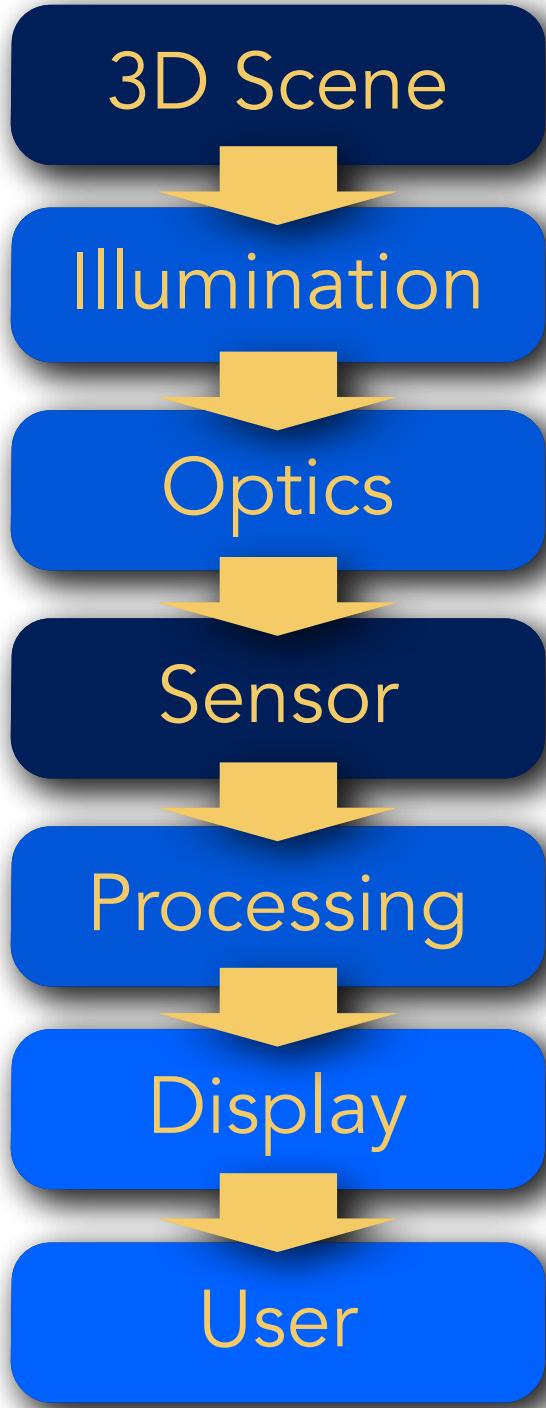
\* Panorama: Another Example  
of Computational Photography



## Lesson Objectives

1. Steps required to make a panoramic image
2. Identify the five elements of computational photography that are used in making a Panorama

# Dual Photography



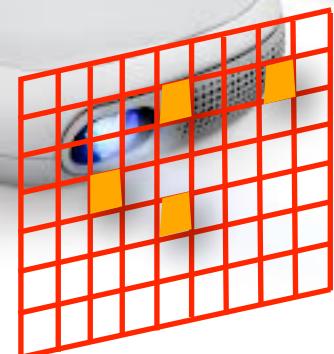
Projector

(Controllable  
Light Source)



Modulator

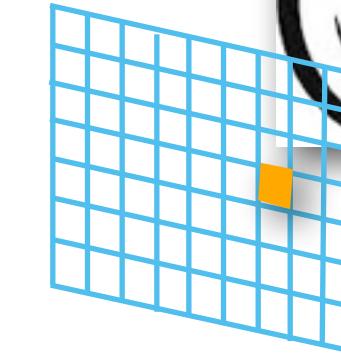
(Controllable  
Aperture)



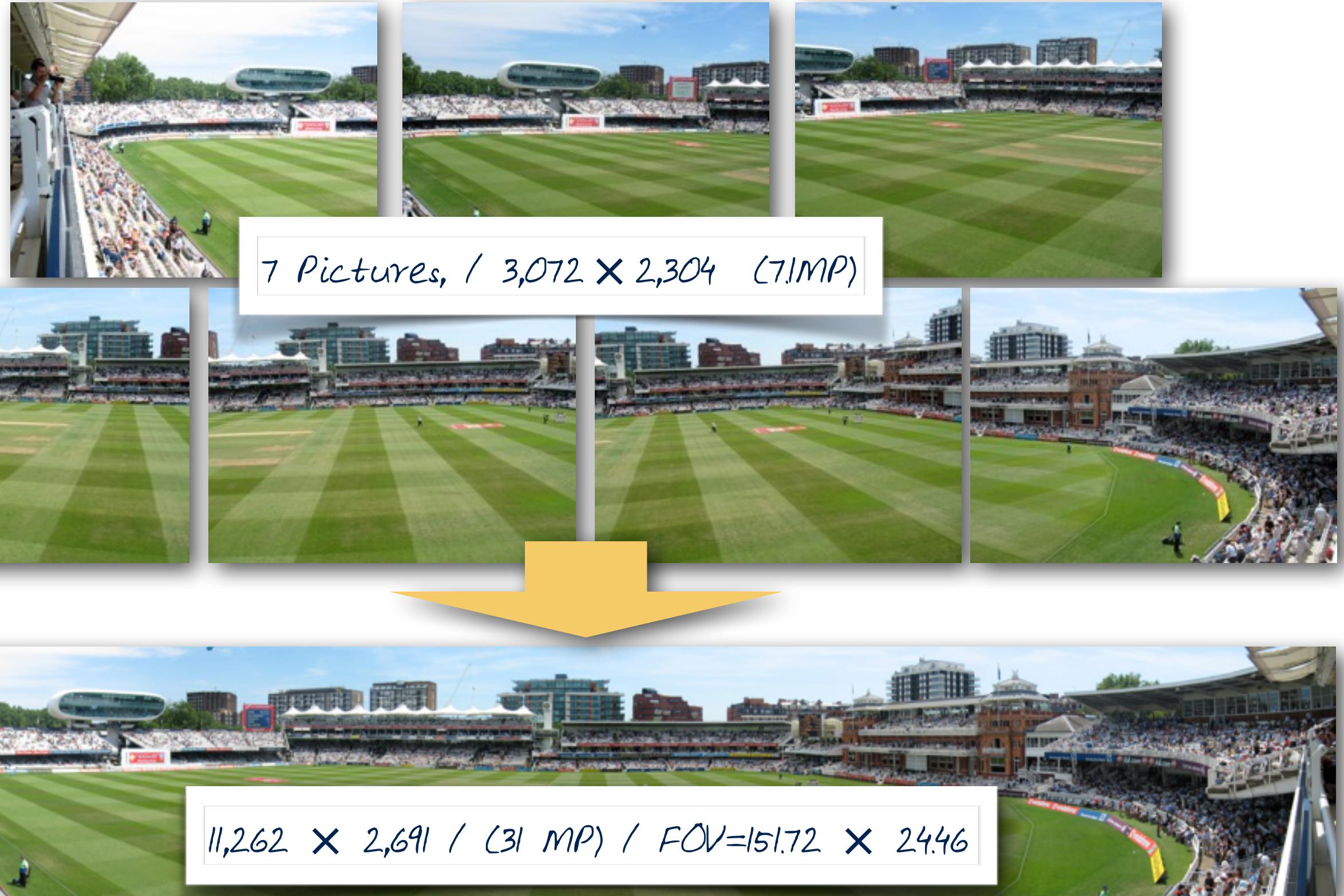
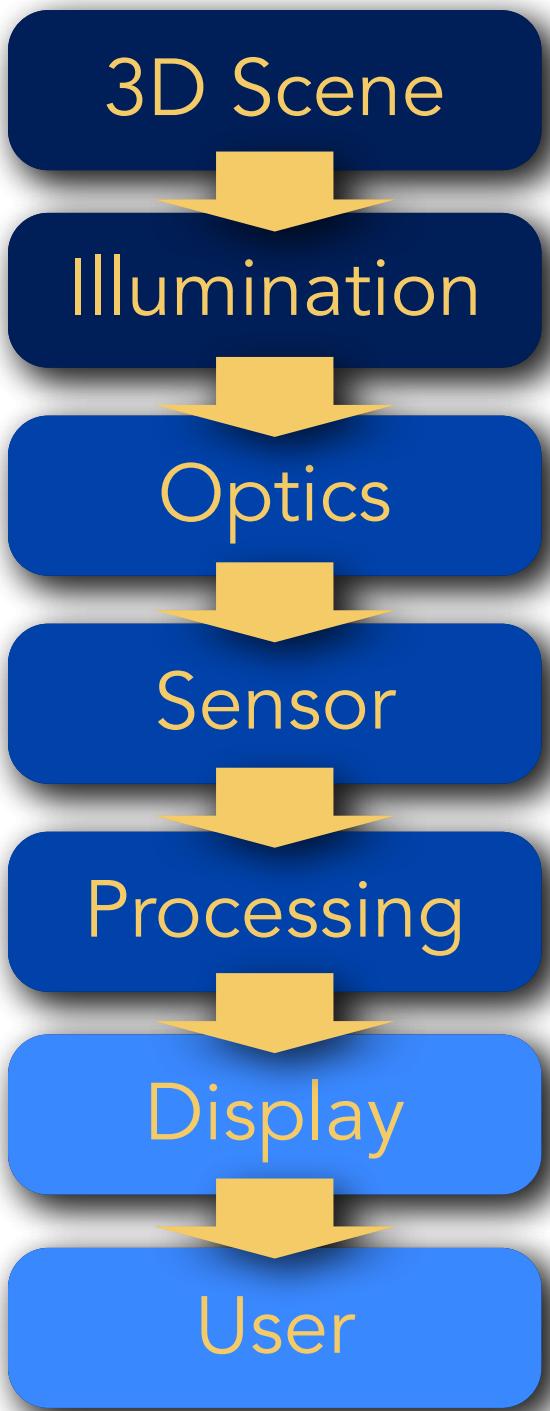
3D SCENE



Camera



Modulator  
(Controllable  
Aperture)

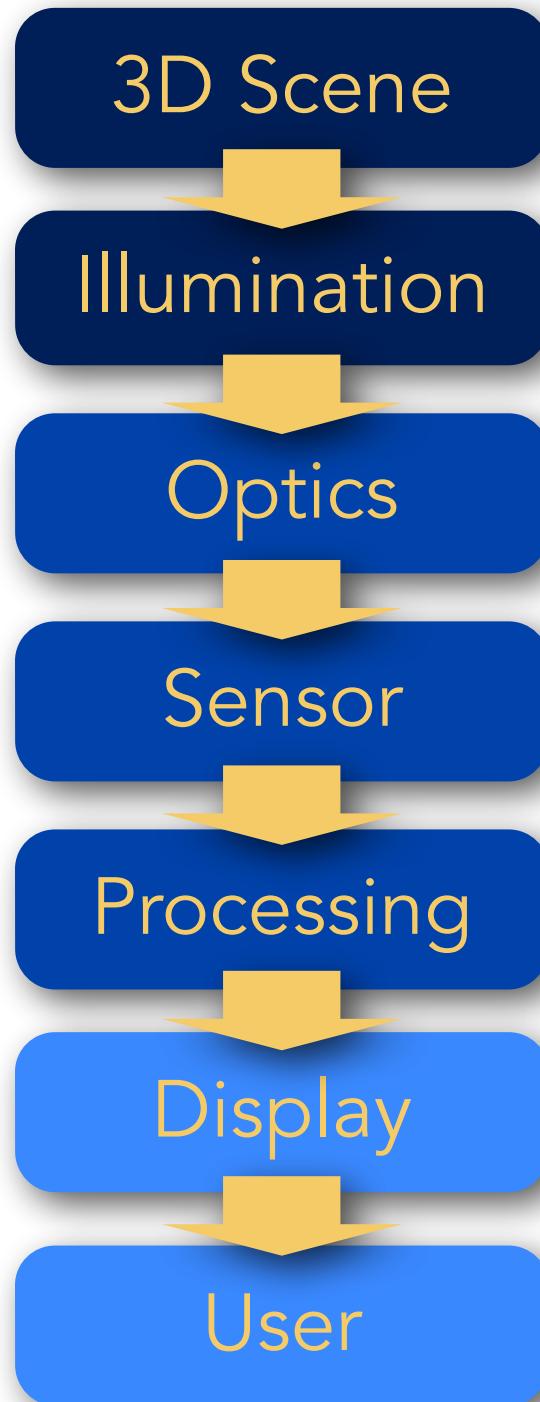


# Step 1: Taking Pictures

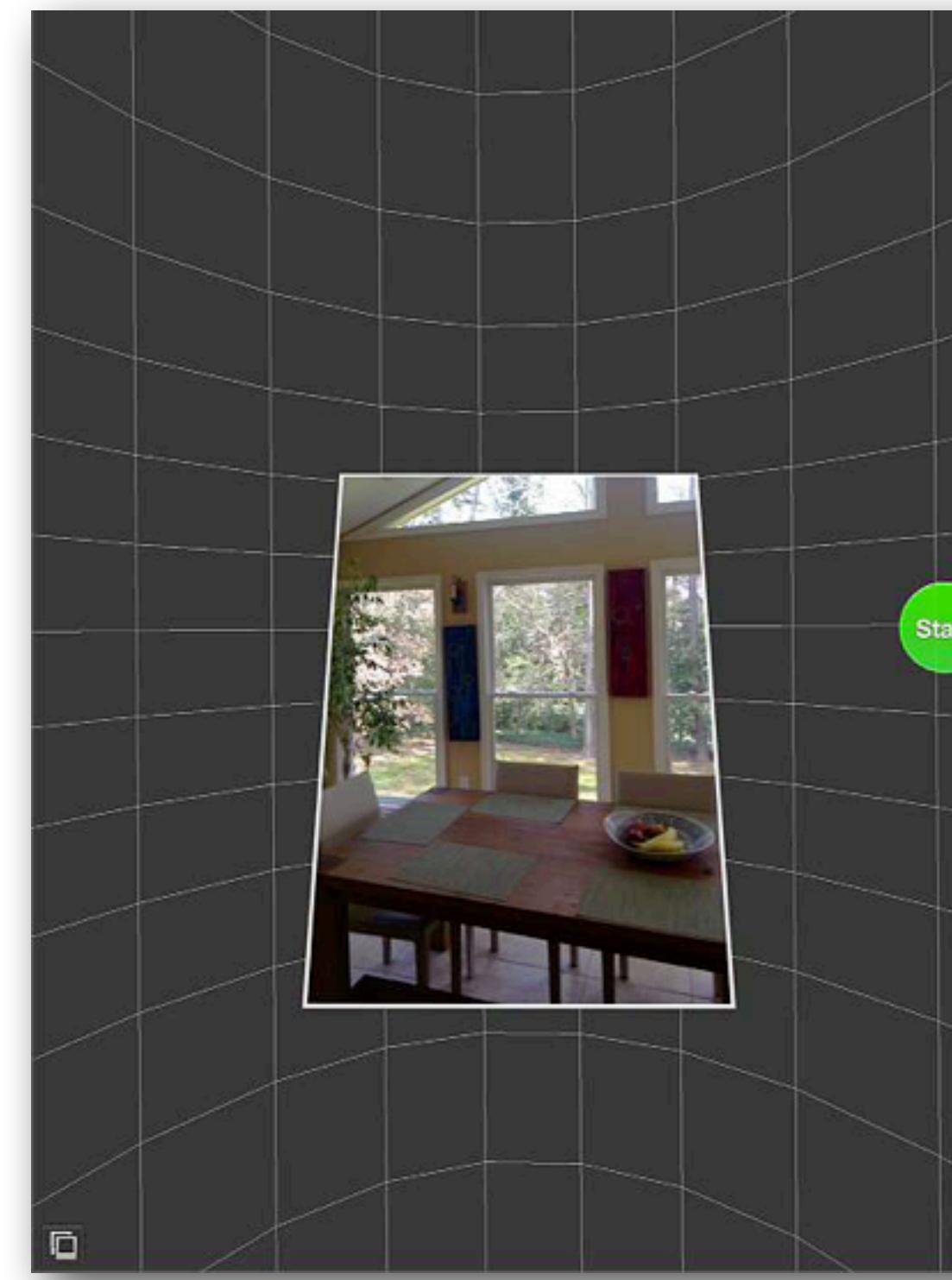
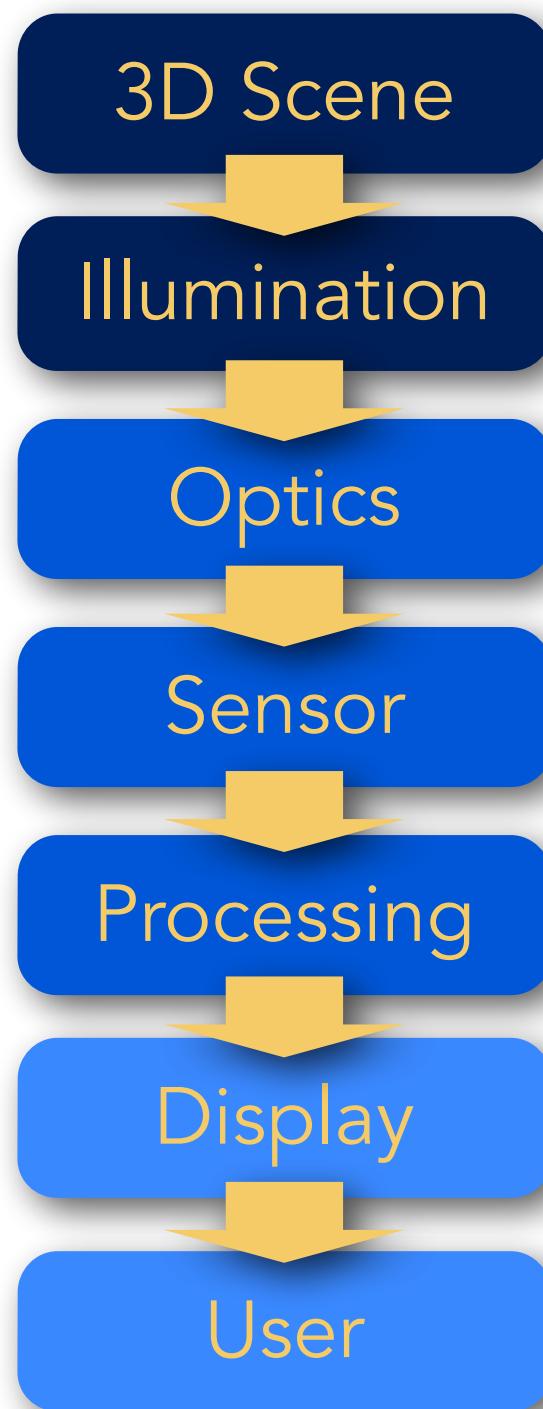


[gigapan.com](http://gigapan.com)

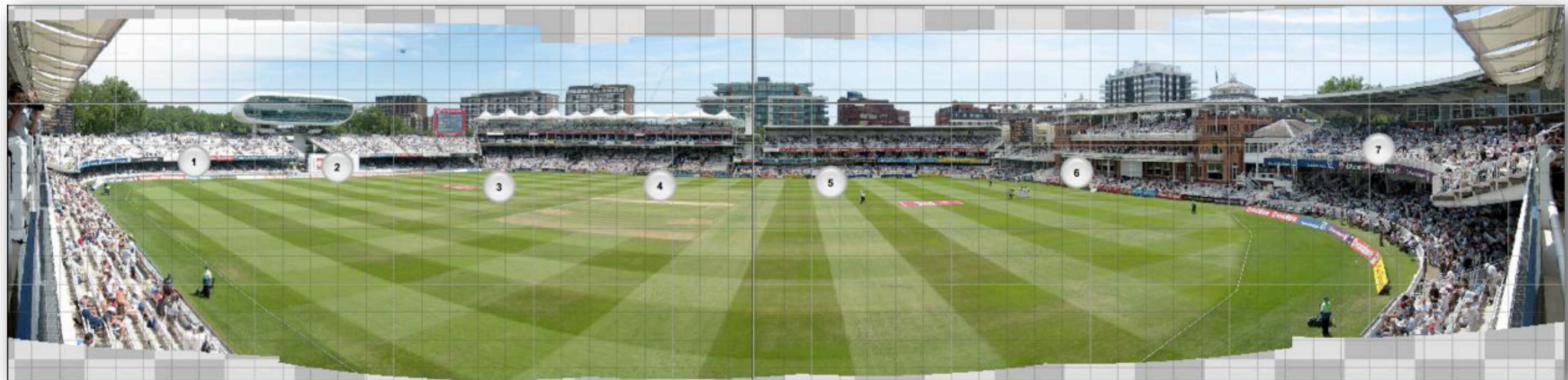
# Step 1: Taking Pictures



# Step 1: Taking Pictures



Consider the steps following Capture: Matching to Warping

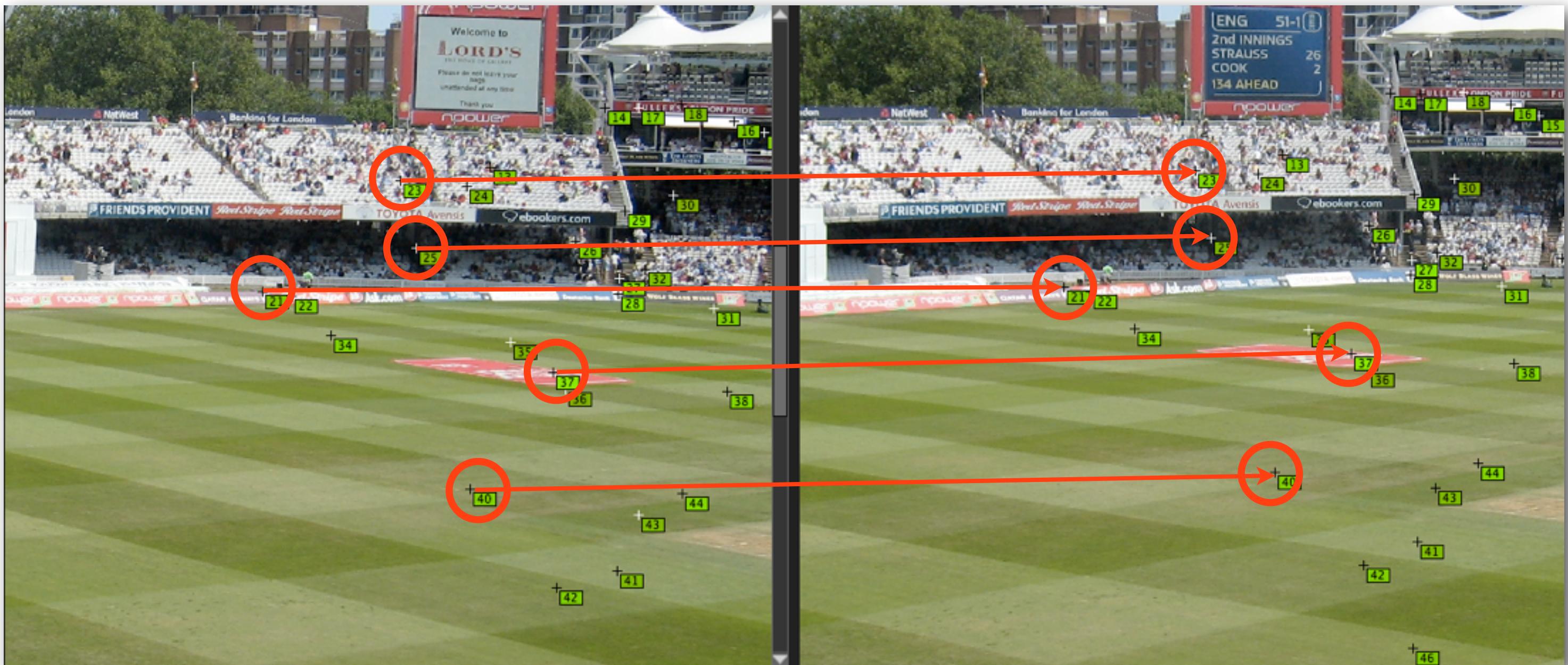


Using kolor autopano giga v3

## Step 2: Detection and Matching



## Step 2: Detection and Matching



# Step 3: Warping



Step 3:  
Warping



# Step 4: Fade, Blend, or Cut



Now we need to choose which pixels from which of  
the images should be visible

# Step 5: Crop (Optional)



# 5 Steps to Make a Panorama



1. Capture Images

2. Detection and matching

3. Warping

4. Blending, Fading, Cutting

5. Cropping (Optional)

(Lords Cricket Ground, London, UK, by I. Essa)

# Summary



- \* Introduced the concept of a Panorama
- \* Presented the steps required to make a Panorama
- \* Related the steps of building a Panorama to the basic elements of Computational Photography

# Neat Class

- \* Why study Computational Photography?
- \* Overview of Computational Photography
- \* How it relates to other disciplines?
- \* How it extends traditional and digital photography?



# Credits



- \* Softwares used
- \* Autopano Giga 3.0 by kolor for macOS
- \* Autostitch by Cloudburst Research for iOS
- \* 360 Panorama by Occipital for iOS

# Computational Photography

- \* Study the basics of computation and its impact on the entire workflow of photography, from capturing, manipulating and collaborating on, and sharing photographs.



© 2014 Irfan Essa, Georgia Tech, All Rights Reserved