Lecture 3 - Image Exposure
IN THIS LECTURE

• Exposure
• Camera Exposure Modes
Camera

A camera’s main functions when you take a picture (or more precisely, make exposure) are to help you view the scene so you can select what you want to photograph, focus to get the scene sharp where you want it to be.

• **The view finder**
  Shows the picture that will print on the film.

• **The film**
  Records the image viewed by the lens.

• **The lens**
  Rotate forward and back to bring objects at different distances into sharp focus.

• **The aperture**
  The aperture adjusts the amount of light reaching the film. A large opening allows the most light to pass through the lens to the film. The smallest opening lets in the least amount of light.

  1/ 1.4/ 2/ 2.8/ 4/ 5.6/ 8/ 11/ 16/ 22/ 32.
• **The shutter**
  It opens and closes to control the length of time that light strikes the film.
  1/1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/500, 1/1000

• **Focus**
  Focus on the most important part of your scene to make sure it will be sharp in the photograph. When photographing a person, this is usually the eye, practice focusing on objects at different distances as you look through the viewfinder so that you become familiar with the way the camera focuses.

• **Manual focus**
  While looking through the viewfinder, rotate the focusing ring on the lens until the scene appears sharp.

• **Factors that control Exposure**
  To get a correctly exposed picture, so that it is not too bright (overexposed) or too dark (underexposed), you—or the camera must set the lens opening (aperture) and shutter speed depending on the sensitivity of the film (its speed) and on how light or dark your subject is.

  The aperture determines how much light passes through the lens; the shutter speed determines the length of time that the light strikes the film.
**Shutter speeds to freeze/capture the action**

<table>
<thead>
<tr>
<th>Type of motion</th>
<th>Speed</th>
<th>Camera-to-subject-distance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>25ft</td>
</tr>
<tr>
<td>Very fast walker (5 mph)</td>
<td>1/125</td>
<td>1/60</td>
</tr>
<tr>
<td>Child running (10 mph)</td>
<td>1/250</td>
<td>1/125</td>
</tr>
<tr>
<td>Good sprinter (20 mph)</td>
<td>1/500</td>
<td>1/250</td>
</tr>
<tr>
<td>Speeding car (50 mph)</td>
<td>1/1000</td>
<td>1/500</td>
</tr>
<tr>
<td>Airplane</td>
<td>----</td>
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</tr>
</tbody>
</table>
Using Shutter and aperture together

- **Small aperture** (deep depth of field) f/16, **slow shutter speed** (motion blurred) 1/8 sec.

- **Medium aperture** (moderate depth of field) f/4, **medium shutter speed** (some motion sharp) 1/125 sec.

- **Large aperture** (shallow depth of field), **fast shutter speed** (motion sharp) 1/500 sec.

  Note: the wide aperture f/2 needed gives so little depth of field that the background is now out of focus.
Figure 2-2: This image was created using a very high **ISO** setting (1600).

The camera produced a very noisy image, as you can tell by the color degradation in the dark background.
Camera Exposure Modes

• Most digital cameras have one of the following standardized exposure modes: **Auto**, **Program** (P), **Aperture Priority** (Av), **Shutter Priority** (Tv), **Manual** (M) and **Bulb** (B) mode. Av, Tv, and M are often called "creative modes" or "auto exposure (AE) modes."

- Each of these modes influences how aperture, ISO and shutter speed are chosen for a given exposure. Some modes attempt to pick all three values for you, whereas others let you specify one setting and the camera picks the other two (if possible). The following charts describe how each mode pertains to exposure:
• Camera Exposure Modes:

✦ Auto (□): Camera automatically selects all exposure settings.

✦ Manual mode: You control both shutter speed and aperture. This mode gives you complete control over the image-making process, but you have to keep a close eye on changing light conditions.
Program mode: The camera makes all the choices for you. Most cameras follow an algorithm designed to create the best chance of an acceptable image.

Shutter Priority mode: This mode lets the user pick the shutter speed and then the camera chooses the appropriate lens opening for proper exposure. There are a couple of ways to use this mode. One way is to use it to set a minimum shutter speed necessary to freeze action. The other is to set the camera to the slowest shutter speed necessary to prevent camera shake so that the camera stops the lens down to the smallest opening possible.
Aperture Priority mode (AV): This mode is the reverse of the previous mode. Here the user chooses the lens setting and the camera sets the shutter speed. Aperture Priority is useful for stopping action because the user can set the lens wide open so the camera chooses the fastest possible shutter speed.
You may be able to view exposure settings in the **viewfinder** or on the **monitor display**
A slow shutter speed blurs motion, giving the water a softer, mistier look.
In addition, the camera may also have several pre-set modes; the most common include landscape, portrait, sports and night mode.

The symbols used for each mode vary slightly from camera to camera, but will likely appear similar to those below:
Sports mode: Represented by the icon of a person running. When you press this button, the camera chooses a shutter speed and aperture combination designed to freeze the motion of fast-moving athletes.

Landscape mode: Represented by the mountain icon. Press this button when you’re shooting scenic photos, and the camera picks settings that allow for the maximum depth of field. It also produces a sharp overall image without worrying about fast shutter speeds because there is little motion to worry about stopping.
✧ **Portrait mode:** Represented by the head-and-shoulders icon. Press this button to activate the camera’s auto mode for portrait photography. This program opens the camera lens to create shallow depth of field and throws distracting backgrounds out of focus.

✧ **Macro mode:** Represented by the flower icon. For close-up photography, press this button to activate the camera’s close focusing settings and to close the lens down to create the greatest possible depth of field. This mode should also turn on the camera’s LCD screen for use as an electronic viewfinder.