Tips for better photos

Lunchbite series
Difference between Digital and Film Camera

- **Image Sensor**
  - DC: Image Sensor (CCD, CMOS)
  - FC: Negative Film, Slide, etc...

- **Storage**
  - DC: Memory Card (CF, SD, Memory Stick)
  - FC: Film roll

- **Instant Display**
  - DC: Can view the photo from the LCD immediately
  - FC: You should develop the film first
Difference between Digital and Film Camera (cont’)

Sensor Size
- DC: usually smaller (e.g. 7.2mm * 5.3 mm)
- FC: 35mm film (35mm * 26mm)

Film (Sensor) Speed (i.e. ISO 100, 200, 400, …)
- DC: can change ISO anytime
- FC: depends on the film used
Difference between Digital and Film Camera (cont’)

- **Lens**
  - DC: smaller focal length (e.g. 7mm – 21 mm)
  - FC: larger focal length (e.g. 34mm – 102mm)
**Shutter / Aperture**

- **Shutter Speed**
  - is the amount of time that light is allowed to pass through the aperture (e.g. 15s, 1s, 1/30s, 1/60s, 1/1000s, etc…)

- **Aperture**
  - controls the amount of light that reaches the sensor
  - Diameter of an aperture is measured in f-stops (i.e. smaller the f-stop, larger the diameter)
Depth of Field

- Depth of field (DOF)
  - The amount of distance between the *nearest* and *farthest* objects that appear in acceptably sharp focus in a photo
  - Aperture, focal length, sensor size and subject distance also affect the DOF
    - Smaller the aperture (i.e. larger f-number, e.g. f/8, f/16) gives a larger DOF
    - Shorter focal length of lens gives larger DOF
Depth of Field (Aperture Size)

Example 1 (fixed focal length - 50mm):
Depth of Field (Focal Length)

Example 2 (fixed aperture size)

You can see that shorter the focal length of the lens, larger the DOF.
Depth of Field (cont’)

However, the DOF of compact digital camera is significantly greater than 35mm film camera
– if the field of view of DC lens focal length of 21mm is equivalence to lens with focal length of 102mm in 35mm film camera, then
  \[ N = \frac{102}{21} \approx 5 \]
is the focal length equivalence factor
– The DOF of a DC with focal length equivalence factor N at a given F-number is the same as that of a 35mm film camera with aperture number of F * N
(i.e. the DOF of DC at f/2 \( \approx \) DOF of FC at f/11) !!!
Depth of Field (cont’)

Example

DC with focal length equivalence factor ≈ 5
Angle of View

- Angle of View depends on the focal length of the lens
  - Focal length 50mm gives wider angle of view
    - Also expand distance
  - Focal length 300mm gives narrower angle of view
    - Also compress distance

20mm f/2.8
(Buildings look far away)
Distance Expanded!

50mm f/2.8
(Similar to what human see)

300mm f/2.8
(Buildings look very close!)
Distance Compressed
Let’s shoot!

- **Outdoor (sunny day)**
  - No problem, even AUTO mode works fine

- **Outdoor portrait (at night) / Indoor (dim light)**
  - Shutter speed becomes slower
  - Can use flash to get a faster shutter speed 1/60 second (Be aware that flash will make cool atmosphere)
  - However, the background usually becomes very dark
    - **Solution:** use slower shutter speed (i.e. 1/20 s shutter speed + fill flash)
    - **Result:** the background becomes brighter and color is more natural
Examples (At night)

Shutter: 1/60 seconds  
Aperture: f/4  
Flash Light: ON

Shutter: 1/15 seconds  
Aperture: f/4  
Flash Light: ON (-1/3 flash power)
Examples (Indoor)

Shutter: 1/60 seconds
Aperture: f/2.8
Flash Light: ON

Shutter: 1/15 seconds
Aperture: f/2.8
Flash Light: ON
Be aware~~!

Hand-holding rule of thumb
- The slowest shutter speed that you can still hand-holding your camera and still achieve a sharp image is:

\[ \text{Minimum shutter speed} = \frac{1}{\text{lens focal length}} \]

e.g. if using your wide-end (7mm), the minimum shutter speed = 1/7 second
if using your tele-end (21mm), the minimum shutter speed = 1/21 second
- Slower shutter speed will result in blurred image due to hand shake…
Let’s shoot (cont’)

- Portrait + Far away scenery

How to make the building behind looks closer?

**Solution:** use larger focal length (Zoom) to compress the distance! (e.g. 300mm)

**Result:** The building looks closer! But blurred?! Why? (Tips: DOF)

**Solution2:** use larger focal length as well as smaller aperture! (i.e. 300mm, f/22)

**Result:** The building looks closer and sharp!

To make everything in focus, you should know what is **hyperfocal distance**!
Hyperfocal distance

- If the lens focuses at infinity, the depth of field starts at somewhere in front of the lens and extends to infinity.
- Focuses at infinity to take the scene far away can make the scene appears sharp.
- However, the subjects near to the lens are out of focus.
- The distance from the lens to the points that make out-of-focus image is referred to as the **hyperfocal distance**.
Hyperfocal Distance

To make the subjects near the lens and the scene far away both in focus, the lens should focus at the hyperfocal distance (H)! Then subjects located inside the H/2 to infinity will look sharp.

How to find it?
Hyperfocal Distance

Hyperfocal distance \( (H) = \frac{f^2}{(N \cdot c)} + f \)

where:
- \( f \) – the lens focal length, mm
- \( N \) – the f-number (aperture)
- \( c \) – the circle of confusion, mm

The circle of confusion \( (c) \) depends on the size of the sensor (e.g. compact digital camera have \( c = 0.005 \) to \( 0.007 \))
Hyperfocal Distance

- Digital Camera: Canon G2
- Lens: 7mm-21mm
- Aperture: f/2 – f/8
- Circle of Confusion = 0.006mm

You can go to http://www.dofmaster.com to get the chart for your camera
General tips to good photos

Shoot at the eye level of your model

Good...

Much Better...
General tips to good photos

Focus on model’s eye

Bad…

Much Better…
General tips to good photos

- **Rule of Third**
  - Instead of placing the main focus of interest in the centre of the frame, which gets a little boring, that you look to position it on an intersection of the thirds.

- This is a principle taught in graphic design and photography and is based on the theory that the eye goes naturally to a point about two-thirds up the page.

![Good Image](image1.png)

![Much Better Image](image2.png)
General tips to good photos

- Using Diagonals
General tips to good photos

- Open up a path
  - Anything that moves needs a path to continue its action
  - Anything with eyes needs some open space to look at
Panorama

- Sometimes, your lens is not wide enough to capture the whole scenery within a photo.
- Or you want to make a 360 degree view, you can use some software tools to help to combine multiple photos into one.
Panorama (cont’)

Panorama Factory
  – http://www.panoramafactory.com/

Tips
  – Capture the photos vertically (allow more space up and down)
  – Allow 1/3 overlapping between images
  – Lock the exposure (make consistent exposure in all images)
  – Use focus on hyperfocal distance (avoid inconsistency sharpness between images)
  – Use Tripod!