

HIGH DYNAMIC RANGE IMAGING

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First - What Is Dynamic Range?

- Dynamic range is essentially about Luminance – the range of brightness levels in a scene
 - From the darkest levels to the brightest levels
 - Dynamic Range is Measured in F Stops
 - Each F Stop is a doubling or halving of the amount of light being received by the image sensor
 - Typically a Digital Sensor is able to capture about 5 to 6 F Stops of Dynamic Range
 - The total range of brightness values encountered in the real world is about 10 stops — from the dimmest light that you can read in to the brightest beach or snow scene in which you might find yourself.

What is HDR Photography

- HDR photography is an exercise in capturing more luminance (light) than your camera wants to, capturing more than 5 or 6 stops of Dynamic Range.
 - Digital Cameras have a problem with dark darks and bright brights in the same scene.
- An HDR (High Dynamic Range) image stores pixel values that span the whole tonal range of real-world

When Should You Use HDR?

- Simple Example
 - Digital Cameras can't capture a bright sky with a dark foreground the way we can see it.
 - So we have to choose:
 - ♣ Do we expose for the sky and have no detail in the dark foreground.
 - ♣ Or do we expose for the foreground and have no detail in the sky
 - With HDR Photography we can have both:
 - ♣ Close to the way we see it in real life.

What Is The Workflow of HDR Photography?

- HDR starts out with 2 or more photos each with different exposure settings.
 - One or more to capture details in Highlights
 - One or more to capture details in Shadows
- Software is used to Combine the photos to bring out the maximum amount of detail in the Final Image

What Equipment Do You Need For HDR Photography?

- A Camera: preferably a Digital SLR but pro-consumer point and shoots will work (more on this later).
- A sturdy Tripod (Although not necessary)

- A Remote Release switch. This is possibly the least important as you can always set the timer or the camera.
- A computer with HDR Software and photo editing software.
 - For the Purpose of this Tutorial we will cover:
 - Photoshop Merge To HDR Pro
 - Photomatrix Pro (Stand alone)
 - Nik HDR Efex Pro Plugin (Lightroom and PS)

How Do You Shoot Photos for HDR?

Auto:

- Most of today's digital SLR's have build in auto-exposure bracketing (AEB) feature
 - Turn this on and your camera will take several shots with different exposures
 - ♣ First shot is usually a middle exposure using settings you deemed correct for the scene
 - ♣ The following frames will capture details in the highlight and shadow areas

Manual:

- If your camera does not have an Auto Exposure Bracket Feature you can do it manually
 - Take a photo with middle/correct exposure - one that is the best the camera can do with one shot
 - Take one or more underexposed shots to get detail in the highlights
 - Take one or more overexposed shots to get detail in the shadows.

Tip 1 – Constant Aperture

- This is the most important step in Shooting HDR
 - Only vary the shutter speed not the aperture when taking your underexposed and overexposed shots
 - If taking Auto (AEB) make sure camera is set on Aperture Priority
 - If manual – set camera on manual mode, select the aperture you want then just vary the shutter speed
 - ♣ Shorter shutter speeds will capture details in the highlights
 - ♣ Longer Shutter speeds will bring in more light and provide detail in shadows.

Tip 2 – Use a Tripod

- You can hand hold if you have fast shutter speeds and your camera is capable of shooting high burst rates but
- For Tack Sharp Images Use a Tripod

Tip 3 – Separate your HDR images

- Before taking your series of shots, take a shot with hand in front of the camera
- This will allow you to know which photos go together and ones that you will have to process

Tip 4 – Turn off Auto Settings

- Usually good to turn off Cameras auto settings such as Auto White Balance and Auto Focus
 - This will give you Predictable Results
 - You don't want these features to change during the series of shots

Tip 5 - Exposures (Auto Bracketing or Manual Bracketing)

- Expose your primary shot for the part of the scene that is most important, and bracket other exposures from there.
- Try to capture fewer exposures at first, and study your final products to figure out what you need to do better.

Will HDR Only Work With Raw Images?

Nope – Will also work with JPEG but for best results shoot in RAW, BUT:

- You will get the most dynamic range if you use the software to combine RAW files.
- It is worth repeating the point—if you try to merge to HDR with anything other than RAW data you are not getting the maximum possible dynamic range.

How Many Shots and How Many Stops Apart Should They Be?

- At Least 3 Shots:
- On Middle Exposed
- One Overexposed
- One Underexposed
- Start With Increments of + and – 2 F Stops

Once You Have Taken your Shots and loaded in computer – What Next?

- First there is the process of generating (or merging) the photos into the HDR file
 - Yep – this is a file format and it is ugly (image.hdr)
- This file has all the tones you have captured and merged, but your computer screen and printer can display this – so you have to reduce it to a lower dynamic range image

Once You Have Have Your HDR File – What Next?

- Next You will Tone Map the image.
 - This is where you will tell the software how to go from a HDR image to a Lower Dynamic Range Photo
 - Tone mapping is the process in which the colors of an HDR image are mapped to a normal image (LDR). In other words the dynamic range of an HDR image is reduced to fit into a normal image (LDR)
 - ♣ This is where the magic occurs
 - You can Create a Natural, Real – World – Look
 - Or a Surreal, Grungy, Painterly Look

What Generates HDR Files and Tone Maps?

- Specialized HDR Software , either stand alone software or plugins for PS, LR or Aperture.
- For the Purpose of this Tutorial we will cover:
 - Photoshop Merge To HDR Pro
 - Photomatix Pro (Stand alone)
 - Nik HDR Efex Pro Plugin (Lightroom and PS)

Choosing the Mode:

- The Mode drop-down list provides three possibilities:
 - You should leave this set to 16-bit because you get better image quality at 16-bit than 8-bit. On the other hand, 32-bit doesn't gain you anything over 16-bit since photos start life as 14-bit maximum.
- With 16-bit selected, you can choose Local Adaptation, Equalize Histogram, Exposure and Gamma, or Highlight Compression from the drop-down list to the right of the bit-depth drop-down. Choose Local Adaption.
- Assuming you've chosen Local Adaptation (as is usually recommended), you can begin adjusting the tone curve in earnest.
- **Recommend Using Presets**
 - Will allow you to see how the sliders change with Realistic Presets compared to Surreal Presets

Summary

- Producing high quality HDR images is primarily in the exposures you make of the scene.
 - Expose your primary shot for the part of the scene that is most important, and bracket other exposures from there.
 - Try to capture fewer exposures at first, and study your final products to figure out what you need to do better.
 - Experiment with exposure bracketing. Try different spacing, and with time you will find what works best for you.
- Whatever Software you use – Learn from the presets
- Start with the Presets and see how the sliders change the image

HDR software reviews, prices websites

Good HDR website: <http://www.stuckincustoms.com/hdr-software/>

HDR review website: <http://captainkimo.com/hdr-software-review-comparison>

Photomatix is the most popular HDR program in the industry and it's the program That a lot of professional photographers use.

OS: Windows & MAC Price: \$99.99

Photomatix Coupon Code: CaptainKimo

<http://www.hdrsoft.com>

Adobe Photoshop CS5 is an advance photo editing program with an HDR tool that creates very realistic HDR image.

OS: Windows & MAC Price: \$699.99, but if you already have CS5 - it's free.

<http://www.adobe.com>

NIK HDR EFEX Pro

HDR Efex Pro is the new standard for creating realistic to artistic HDR images with a revolutionary new all-in-one workflow. HDR Efex Pro includes many one-click visual presets, advanced tone mapping algorithms, powerful HDR controls, and patented U Point® technology.

OS: Windows & MAC Price: \$160

<http://www.niksoftware.com>

Photomatix Pro - Key Sliders:

Strength - You can start with 100%. think of this as the opacity control for the overall adjustment. You can always reduce it.

Color Saturation - Controls how colorful your image will be. Some start with this at 100% and then back off if too saturated. Watch out when there is slot of green grass - this will make it florescent.

Luminosity - Controls how bright the shadows will be, like a fill light.

For illustrative effect, turn way up.

Realistic - don't overdue this

Light smoothing - Lightening the shadows will will produce halos around objects and light smoothing will determine how big these halos will be. Lower settings will produce smaller but more obvious halos while larger numbers will produce larger halos but they will be blended into the image.

Illustrative effect, lower numbers.

Realistic, higher numbers.

Micro contrast - Will exaggerate the textures and fine details.

Illustrative effect, high numbers

Realistic, lower numbers