

Crafting High Dynamic Range Photographs to Create a Classical Oil Painting Look

By

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Dynamic range

- Dynamic range is the contrast difference between the darkest and the brightest values and is measured in exposure values (Bloch 2013, p. 16).



Brightest value

Darkest value

Exposure value

- An exposure value is the amount of light that goes through the lens and is recorded by the camera lens. Increasing the the exposure value by one unit, doubles the amount of light being recorded by the camera whilst reducing the exposure value by one whole unit decreases the amount of light being recorded by half.



-2 EV



0 EV

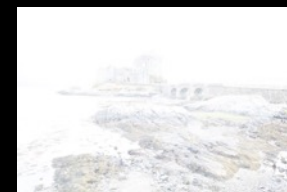


+2 EV

High dynamic range photography

- The dynamic range of an outdoor landscape scene on a sunny day can be over 22 exposure values whereas most digital SLR cameras can only capture around 13 exposure values in a single photographic exposure. One method of capturing the entire dynamic range of the scene is to take multiple different photographic exposures that collectively capture the entire range of scene values.
- These exposures can subsequently be blended together to generate a 32 bit high dynamic range file. This file can subsequently be tonemapped and manipulated to generate the desired visual output by extracting and modifying specific tonal values in the image.

High dynamic range photography



Scene radiance and scene appearance in rendering images

- McCann (2016) describes how painters, given the limited reflectance in the paints gamut had to use their Human Visual System in order to create high dynamic range scene appearances on low dynamic range reflective media. There was no attempt to reproduce scene radiances. “the painter’s ground truth is the appearance of the image” – (McCann 2016)
- Renowned landscape photographer Ansel Adams also never used scene radiances but used his mastery of technical photography to render his aesthetic intent (McCann 2016)
- McCann (2016) suggests that “The same theory applies to many examples of HDR photography. Multiple exposures capture different spatial records of the HDR scene...By combining the highest contrast portion of multiple exposures with desirable LUTs, one can create merged images that conform to the rendering artist’s aesthetic intent. Regardless of the media this first approach is built around the mechanisms of the artist’s HVS. Whether using paint, film, or LUTs, image manipulations based on observer preference are all examples of the Painter’s Technique.”.
- This painter’s technique is what has been used in the production of the images presented here.

HDR photography and painting

- Torcellini (2010) has described the main shared features between works created by the Pre-Raphaelite Brotherhood and high dynamic range photography as coloured shadows, colour in the shadows, low global contrast, high local contrast, high colour saturation, and, well represented reflections of light and colour.
- In order to better match the look to 19th century landscape oil paintings all scene elements need to be in focus and the images need to be free of camera, lens and HDR artifacts such as noise, chromatic aberrations, vignetting, diffraction, localised halos, ghosting and misalignment.





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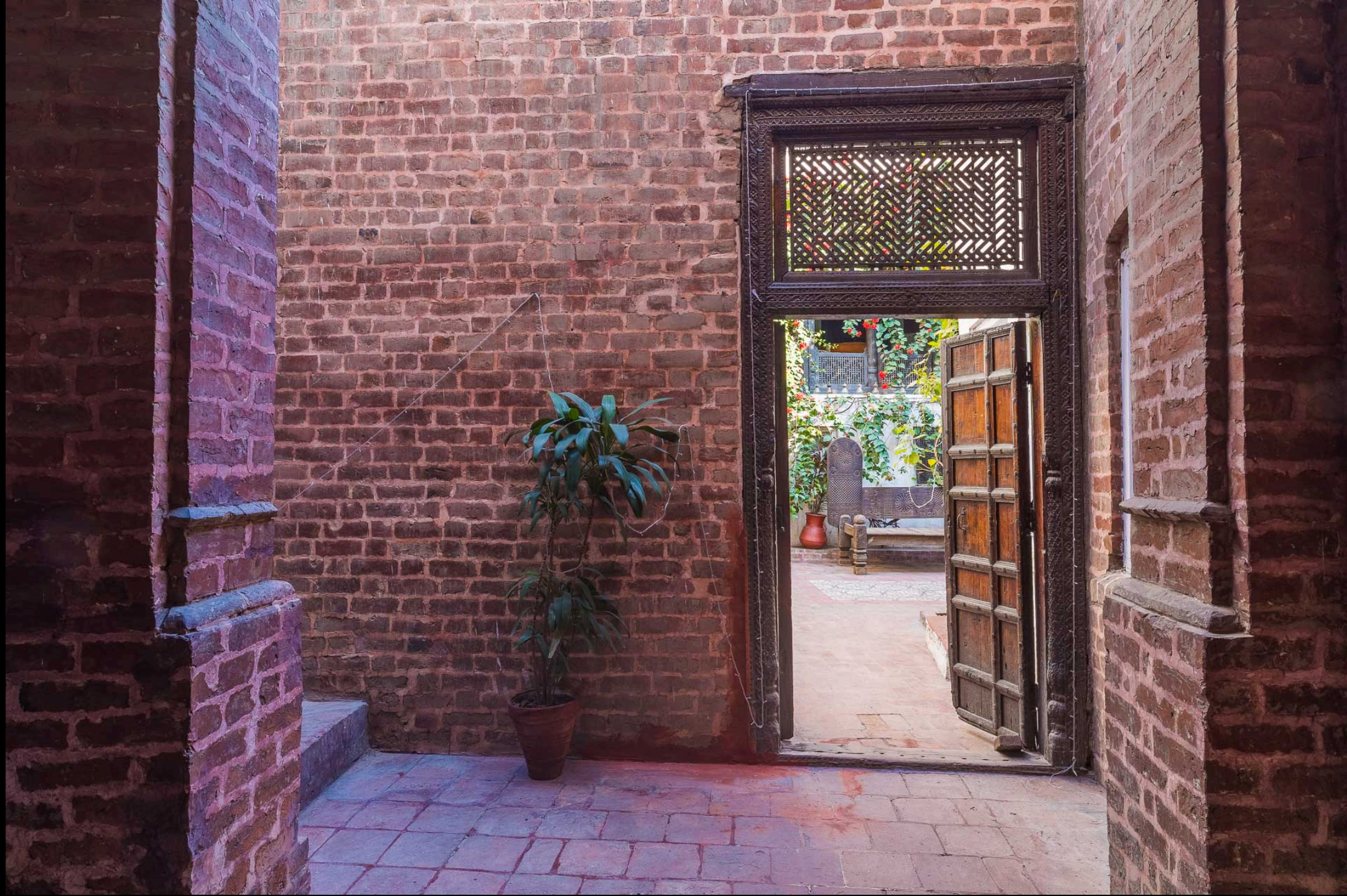
































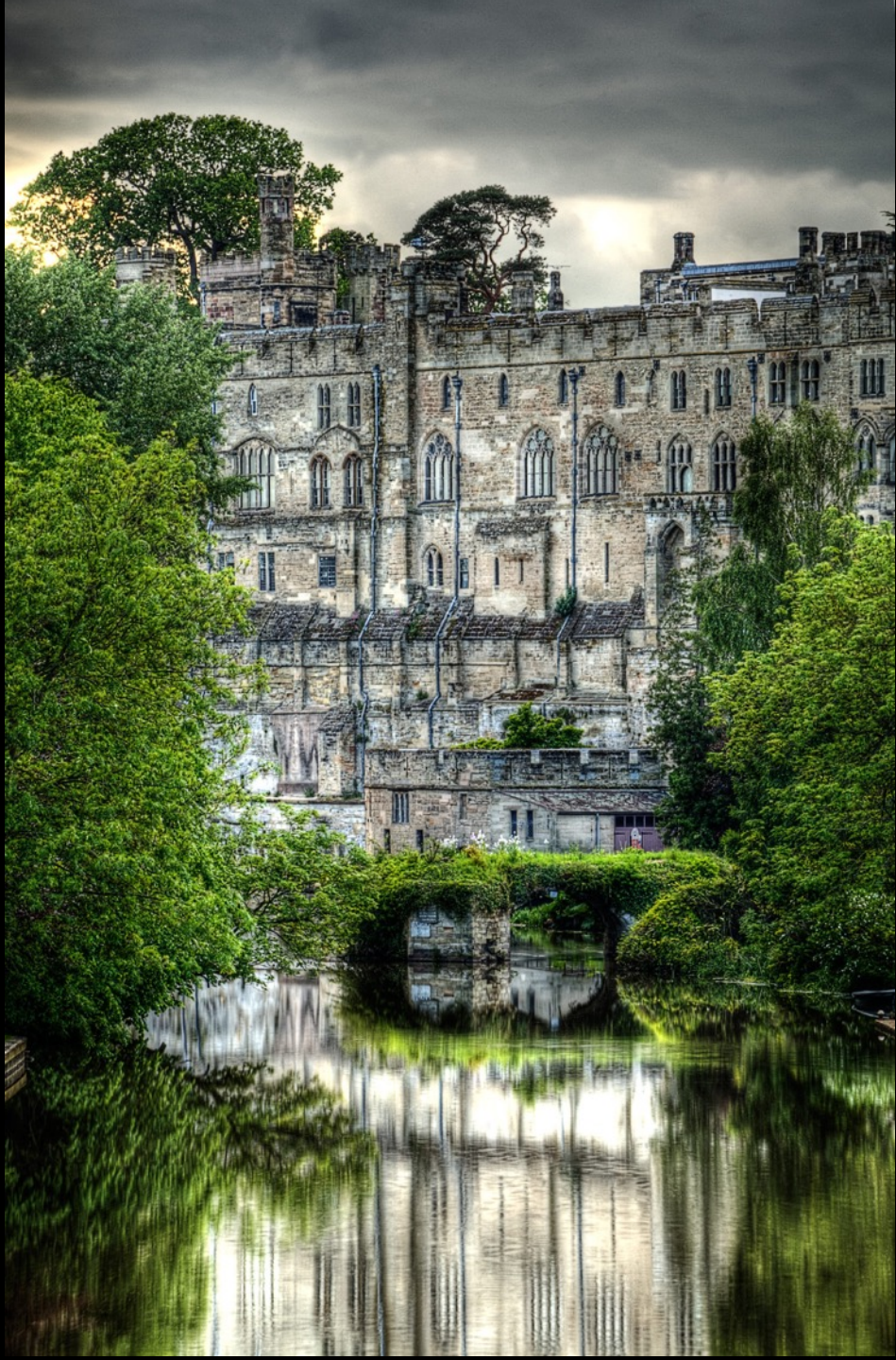




























































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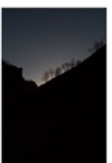
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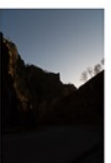
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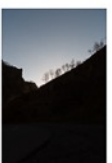
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Overexposed image to capture details in the grass

Normal exposure to capture detail in the sand

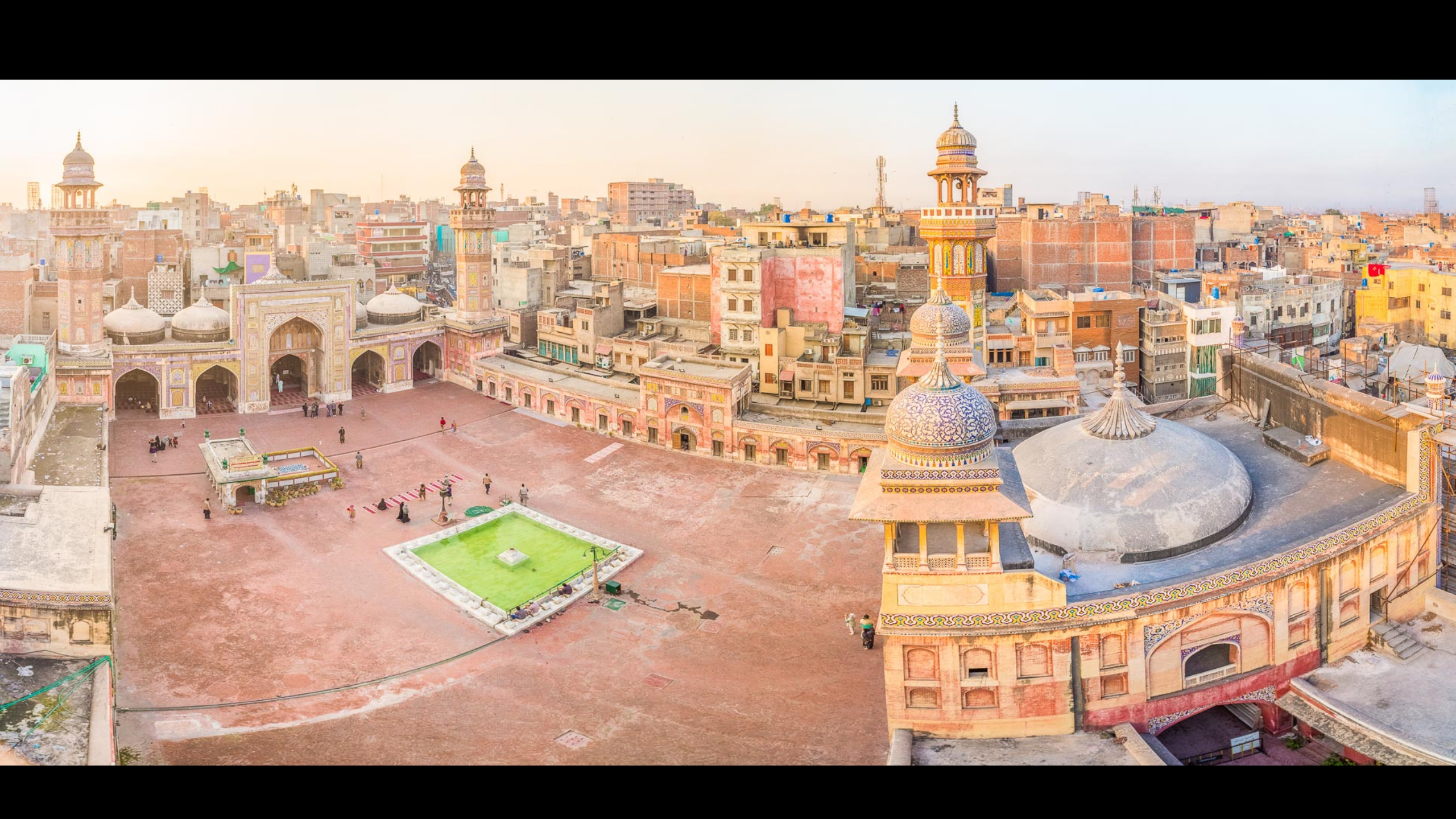
Underexposed image to capture detail in the sky



The final image consists of multiple HDR 'tiles' stiched together to create the panoramic image.















Conclusion

- New tools, same (similar) look
- Too real to be acceptable
- How Art Makes Things Happen: Art driven technology and technology driven art

References

- Bloch, C., 2013. *The HDRI handbook 2.0: high dynamic range imaging for photographers and CG artists*. Rocky Nook, Inc.
- McCann, J. J., 2016. Rendition techniques for HDR scenes in painting, photography, and electronic imaging. *In: Image Processing (ICIP), 2016 IEEE International Conference on*. IEEE. 874–878.
- Torcellini, D., 2010. Painting and photographing the sunlight. A comparison between old-school and avant-garde techniques. *In: CREATE Conference* 353–358.

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