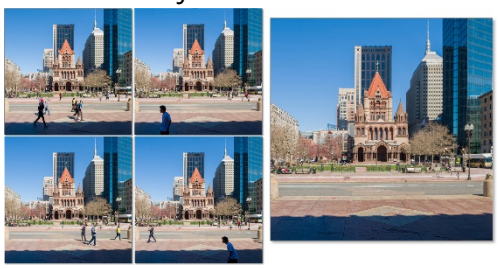
Smart Object - Stack Modes

With Photoshop, you can combine a number of layers into a single *stack* as a Smart Object. With a *Smart Object Stack*, you can determine how the pixels in each layer interact with the pixel in other layers within the stack.



The images in the stack are usually a series of photos using a tripod and the same exposure settings. Take a number of photos of a static object with moving objects (people or cars, for example) over a reasonably short period of time (minutes, not hours, so the lighting doesn't change much).

Select several related or contrasting images and add them as layers to a single PS file, select all layers:

1. Create a Smart Object by choosing Layer→Smart Objects→Convert to Smart Object.
   Note: If the photos were not shot on a tripod, "Align Layers" before creating Smart Object Stack.
2. Return to the Layer→Smart Object submenu and select the Stack Modes submenu that's now available.

Below are the options that determine how the content on the layers within the Smart Object interact to produce the appearance of the Smart Object itself.

- **Entropy**
  - The binary entropy (or zero order entropy "randomness") defines a lower bound on how many bits would be necessary to losslessly encode the information in a set.
  - entropy = – sum((probability of value) * log2(probability of value))
  - Probability of value = (number of occurrences of value) / (total number of non-transparent pixels)

- **Kurtosis**
  - A measure of peakedness or flatness compared to a normal distribution. The kurtosis for a standard normal distribution is 3.0. Kurtosis greater than 3 indicates a peaked distribution, and kurtosis less than 3 indicates a flat distribution (compared to a normal distribution).
  - kurtosis = (sum((value – mean)4) over non-transparent pixels) / ((number of non-transparent pixels – 1) * (standard deviation)4).
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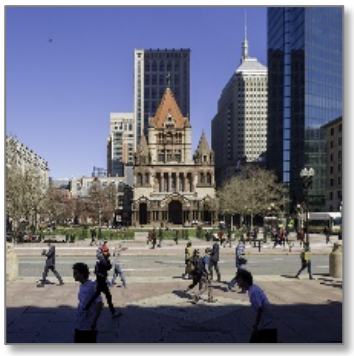
- **Maximum**
  - The maximum channel values for all non-transparent pixels

- **Mean** [Effective for noise reduction]
  - The mean channel values for all non-transparent pixels

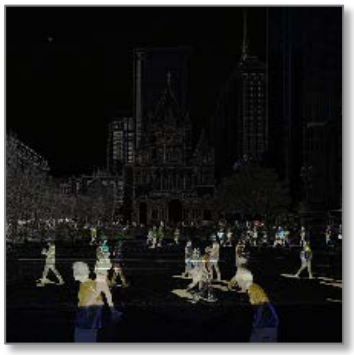
    What will this do our Smart Object? It will take the mean value of each pixel. As a result, our images will look cleaner, you will see an improvement in the noise and will obtain more details.

- **Median** [Effective for removal of unwanted content from the image]
  - The median channel values for all non-transparent pixels

- **Minimum**
  - The minimum channel values for all non-transparent pixels

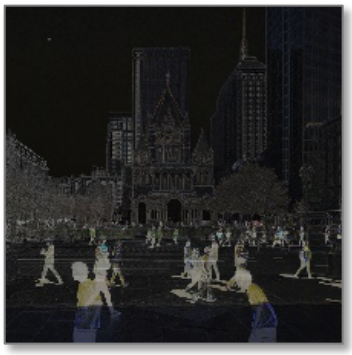


- **Range**
  - Maximum minus the minimum of the non-transparent pixel values



- **Skewness**
  - This is a measure of symmetry or asymmetry around the statistical mean
  - skewness = (sum((value – mean)3) over non-transparent pixels) / ((number of non-transparent pixels – 1) * (standard deviation)3)

- **Standard Deviation**
  - standard deviation = Square Root(variance)



- **Summation**
  - The sum channel values for all non-transparent pixels

- **Variance**
  - variance = (sum((value-mean)2) over non-transparent pixels) / (number of non-transparent pixels – 1)