**Sources**

Image Sharpness Measure (using Fourier Transforms)

<http://www.sciencedirect.com/science/article/pii/S1877705813016007>

Single Number Method (using the variance of the Laplacian)

<http://www.pyimagesearch.com/2015/09/07/blur-detection-with-opencv/>

Overview of Blurriness Measurement Techniques

<http://www.sciencedirect.com/science/article/pii/S0031320312004736>

Python PIL Library

<http://effbot.org/imagingbook/image.htm>

Variance of Laplace Method

<http://optica.csic.es/papers/icpr2k.pdf>

**Notes**

Apparently LAPD (Laplace Diagonal) operator gives the best results. It has the best ability to recover the 3-D image… According to:

<https://arxiv.org/pdf/1604.00546.pdf>

“Estimating depth is an involved problem in computer vision since a dimension is lost during the projection from the 3D real world to a 2D image.”

<https://pdfs.semanticscholar.org/8c67/5bf5b542b98bf81dcf70bd869ab52ab8aae9.pdf>

The goal of Laplacian-based operators is to measure the amount of edges in the image. This is a fairly easy thing for me to determine experimentally, so I went with this technique (as opposed to various other techniques). This technique is often used to simply sharpen an image.

<http://www.idlcoyote.com/ip_tips/sharpen.html>

The Laplacian operator is an example of a second order or second derivative method of enhancement. It is particularly good at finding the fine detail in an image. Any feature with a sharp discontinuity (like noise, unfortunately) will be enhanced by a Laplacian operator. This is important because a well-focused image is expected to have edges and fine detail. Thus, one application of a Laplacian operator is to restore fine detail to an image, which has been smoothed to remove noise. (The median operator is often used to remove noise in an image.)