Wavelet Sharpen T22 – Documentation

DRAFT 4

Version guide

Versions starting with a T are considered Testing versions, and you're the one invited for testing.

When a version is considered stable and usable by the community, it will be rereleased as R version, meaning Release

Basic Usage

Always judge sharpening at 100% view

If your output files look different than the previews, check if you enabled

Output Sharpening in the queue settings.

You might want to experiment a bit until you find some options that match your desired camera/output combination, and then store it as a preset.

Gradient

The Gradient filter works by looking for gradients and then tries to make that gradients steeper. It doesn't create any overshoots or halos.

It works best at low intensities to get reduce the slight unsharpness that the sensors AA filter introduces. Extreme settings can cause posterization/water color like effects, as it will sharpen broad gradients, too.

After the Gradient Sharpen filter, there's a microcontrast enhancement stage, which tries to boost texture sharpness. Again, its best used at low intensity levels (5-10)

Controls:

- Strength — Steepness of the edges
- Width/Iter — Number of iterations to perform, this roughtly translates into the width of the gradients to be considered. Increasing this value has a huge impact on the filter speed
- Microcontrast — Boosts microcontrast in non edge Zones, Low values (5-10) should give best results, higher values mostly boost noise and demosaicing artifacts to much

USM

USM was incorporated into WS as a way to do local contrast enhancements (LCE) aka. „Clarity“. Of course it can also be used as a sharpening Tool, but using the Wavelet Filters usually gives a much better Result.

USM works by adding back a high pass filtered version of the image. See

http://en.wikipedia.org/wiki/Unsharp_mask

Controls:

- Amount — Intensity of the Filter
- Radius — Radius of the filter in arbitrary units. Controls how wide the effect is
- Threshold — Threshold in arbitrary units, Changes lower than threshold won't be applied, use this to reduce impact on noise
- Clarity Mode — Make the Blend Behavior dependent on the originals luminosity. This is very similar to the Clarity Control found in a well known raw developer.

Wavelet Sharpen

Wavelet Sharpen is the general purpose sharpening algorithm in the Plugin. Its provided twice to enable two pass sharpening. It works like a slightly smarter version of the classical USM Filter

Controls:

- Amount — Intensity of the filter, Higher values give sharper edges, but also more halos
- Radius — Radius in arbitrary units, controls which spatial frequency gets sharpened
- Edge — Controls the Edge awareness of the filter. A value of 0 means that the edge awareness is disabled, a value of 100 means full edge awareness. Everything in between is a linear blend.
- S+P Reduction — On some images WS boosts some noise patterns, resulting in Salt and Pepper Style noise. If you notice it, enable this option

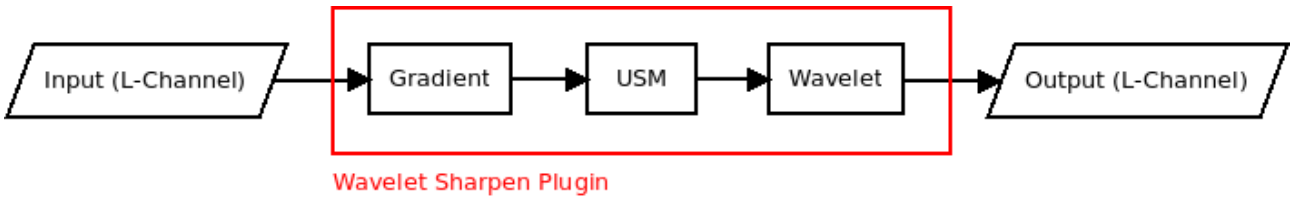
- If you see lots of noise/halos after enabling it, set Bibble sharpening to 0

Technical Notes

My famous flow charts :)

Basic Flow

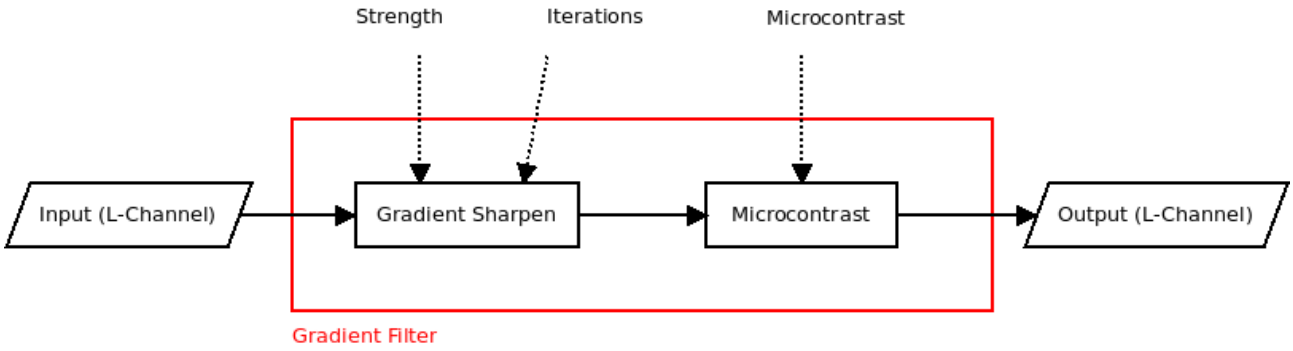
The Wavelet Sharpen plugin consists of 3 Pipeline Stages.



The plugin only operates on the L (Luminance) Channel.

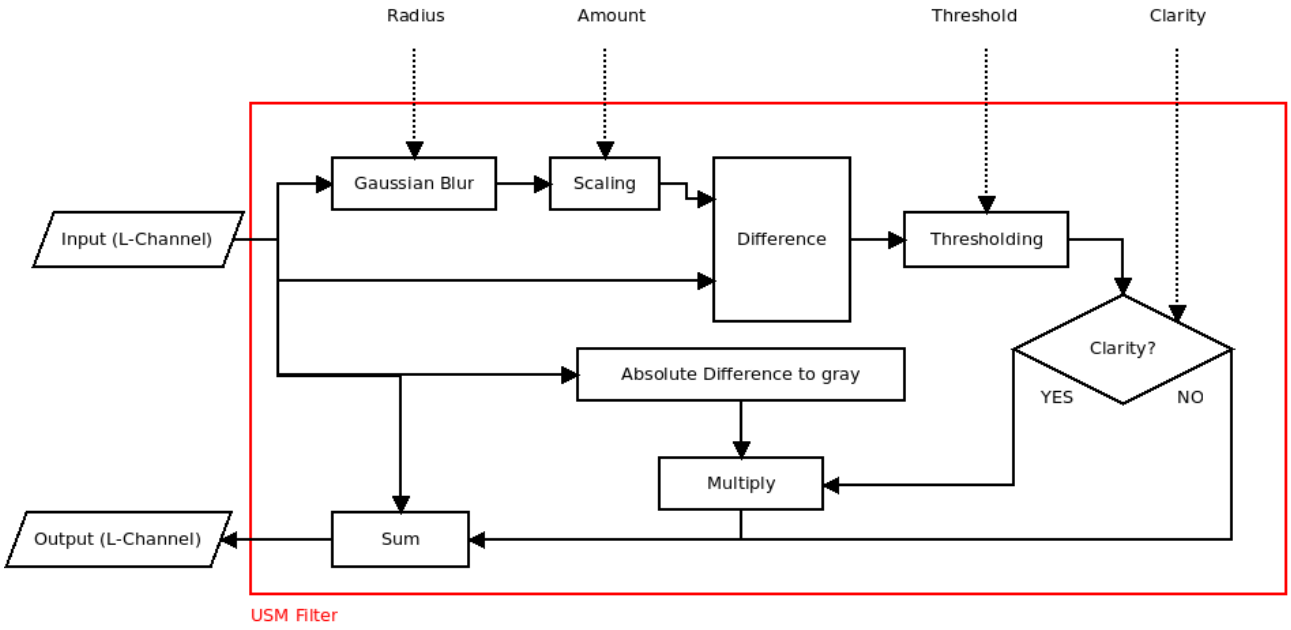
Gradient Filter

See http://www.rawness.es/sharpening/?lang=en for a full explaination of the algorithm (Original author). WS uses an adapted and optimized Version of the code.



USM Filter

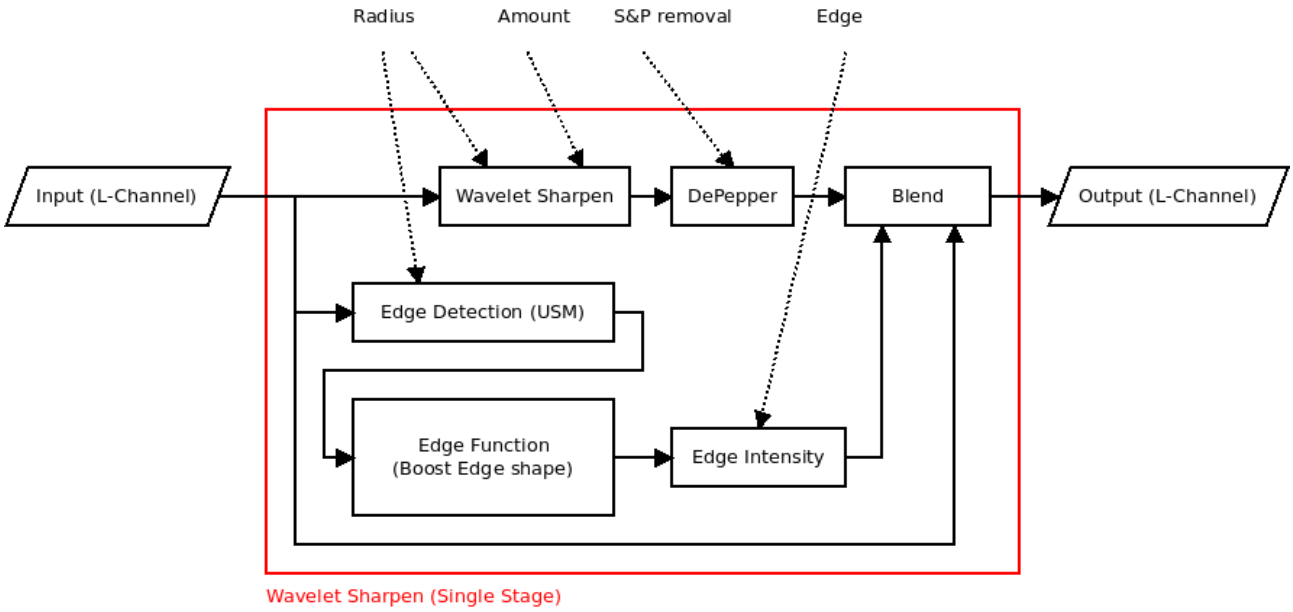
A basic gaussian core, combined with Luminance based blending



Wavelet Filter

The Wavelet Filter doesn't really use wavelets, despite its name. The original code comes from the marcors gimp plugin http://registry.gimp.org/node/9836 . It works very similar to a pyramid sharpening approach. I kept the name, as the filter itself got well known as a gimp plugin with the same name. The original core was modified to work on L*A*B space, and extended with S+P supression, and Edge based masking.

Shown is only a single stage, the second stage is identical



The original Filter was enhanced with an edge based blend and a Salt and Pepper Style Noise Reducer

About

WS originaly started as a port over of my favorite Gimp plugin, to replace the IMHO inadequate sharpening algorithm of Bibble with a more sofisticated method. WS gets developed entirely in my spare time as a hobby project. I'm neighter a large scale company nor do i make a living out of it. Still, if you enjoy the Plugin, I kindly ask you to send me a small donation at http://web.student.tuwien.ac.at/~e0326004/bibble/

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