Stock color negative image with grain

Grain reduction applied to image

GRAIN Reduction Techniques

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AS STUDENTS WHO attended Brooks Institute of Photography in Santa Barbara, we fondly remember some of the jokes students played. The advanced students teased incoming students, promising them good grades by offering bottles of film-grain reducer and jars of image-sharpening fluid. Of course, we never fell for the trick, or at least not more than once.

With all the digital technology available today, solutions to these problems are no longer a joke. Most image-editing software programs on the market today offer image sharpening and grain reduction. You can now sharpen any image with a simple mouse click.

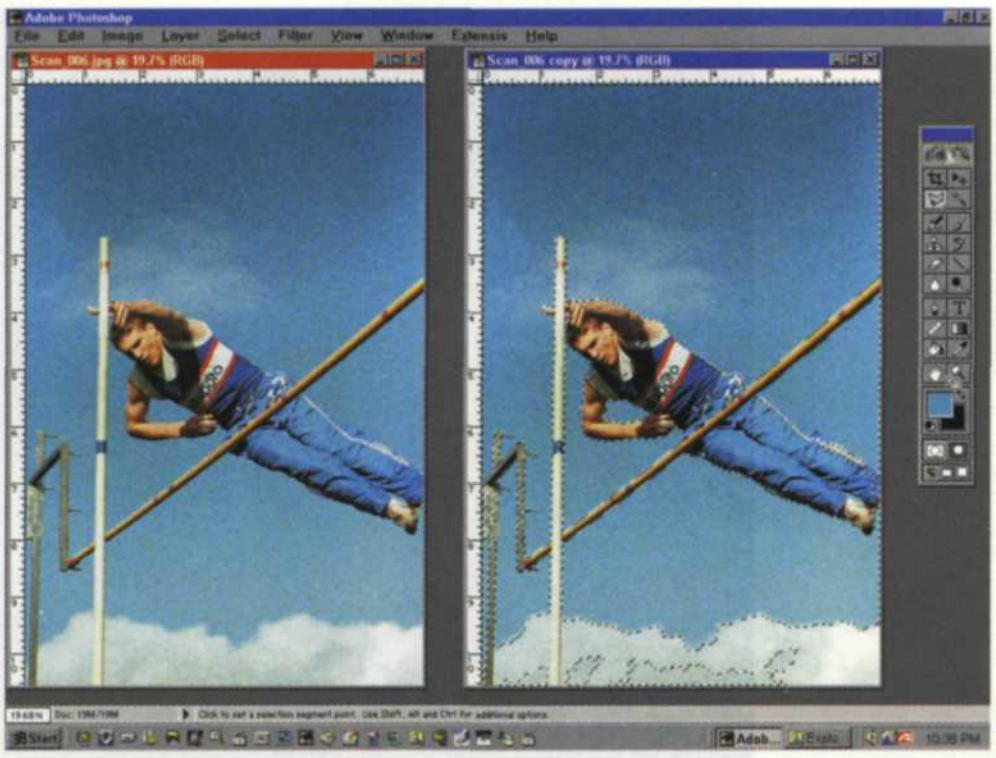
Grain reduction is not quite as easy, but at least it is now possible. In order to help you solve grain problem, we need to look at the different types of images that may be a problem.

The most obvious grain problem occurs from using high speed films. In a nutshell, in order for the emulsion to capture low light, the silver halide crystals have to be larger, resulting in very large grain. You often get the same grain result when you push-process a medium speed film.

There are several other cases when using normal speed films result in larger appearing grain. If you have an image with blue skies, you may find that the grain structure in the sky looks larger than in other image colors. This is due to a problem in film design. Landscape photographers prefer very slow ISO, fine grain films, in order to minimize the grain effect in blue skies.

Nature photographers also have grain problems when they photograph close-up images. The sharp subject hides the grain structure in the subject's fine detail, but the out-of-focus background becomes grain city. Before digital, traditional photographers just lived with grain and made the best of it, but now there are opportunities galore.

The first step in grain reduction is to analyze your image and decide exactly which areas need help. You need to look for out-of-focus areas, skies or large areas of the photo with lacking



Selecting area in right image for grain reduction

Visual selection of grain reduction tools

Grain reduction applied to selected areas in right image

image detail. You must then determine whether you want to reduce the grain in a specific area, or the entire image. If you treat the whole image at once, the process is fast and easy. Selected areas require much more time, but may provide a better end result.

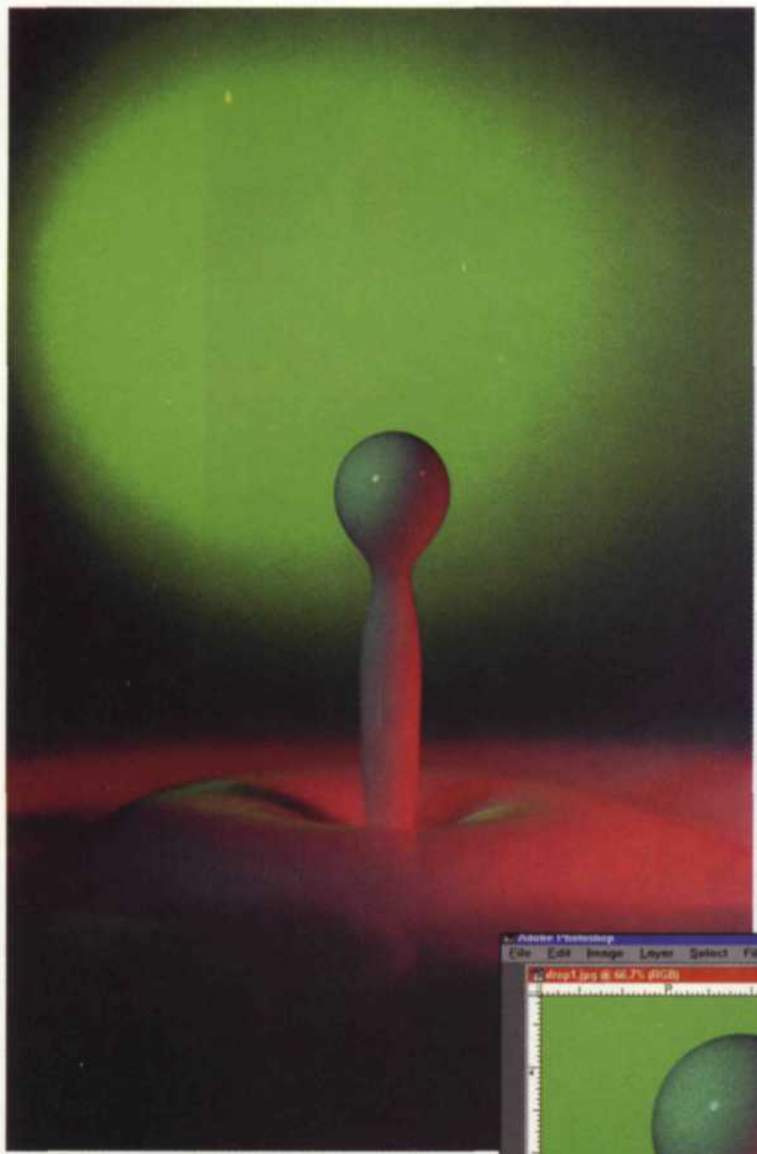
Despeckle, Dust and Scratches, and Smart Blur Filters

If you decide to reduce grain to the whole image, you have several tools that can do the job. In the Photoshop pull-down menu, the best filters are the despeckle, dust and scratches, and smart blur filters. Photoshop offers excellent help for each filter which can save a lot of time. The despeckle filter looks for image edges and protects them while it slightly blurs the small particles that make up an image. The other two filters have radius and threshold controls that determine the extent the filter examines, and how much variation is necessary to blur the data. These two controls may seem complicated at first, but each has a preview function so you can see the results of each change before you make it final.

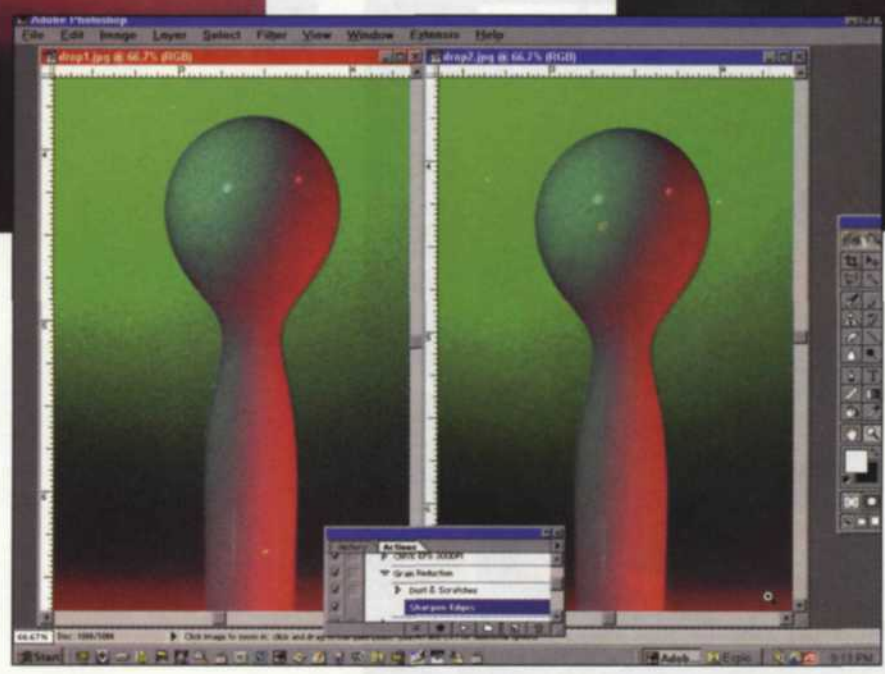
The blurring of the grain does have an effect on sharpness, but you can gain most of it back by using the sharpen filters. The unsharp mask filter also gives you excellent control over reshaping the image without getting the grain back. This is a complex filter, so be sure to read the help function on its usage.

Selection Techniques

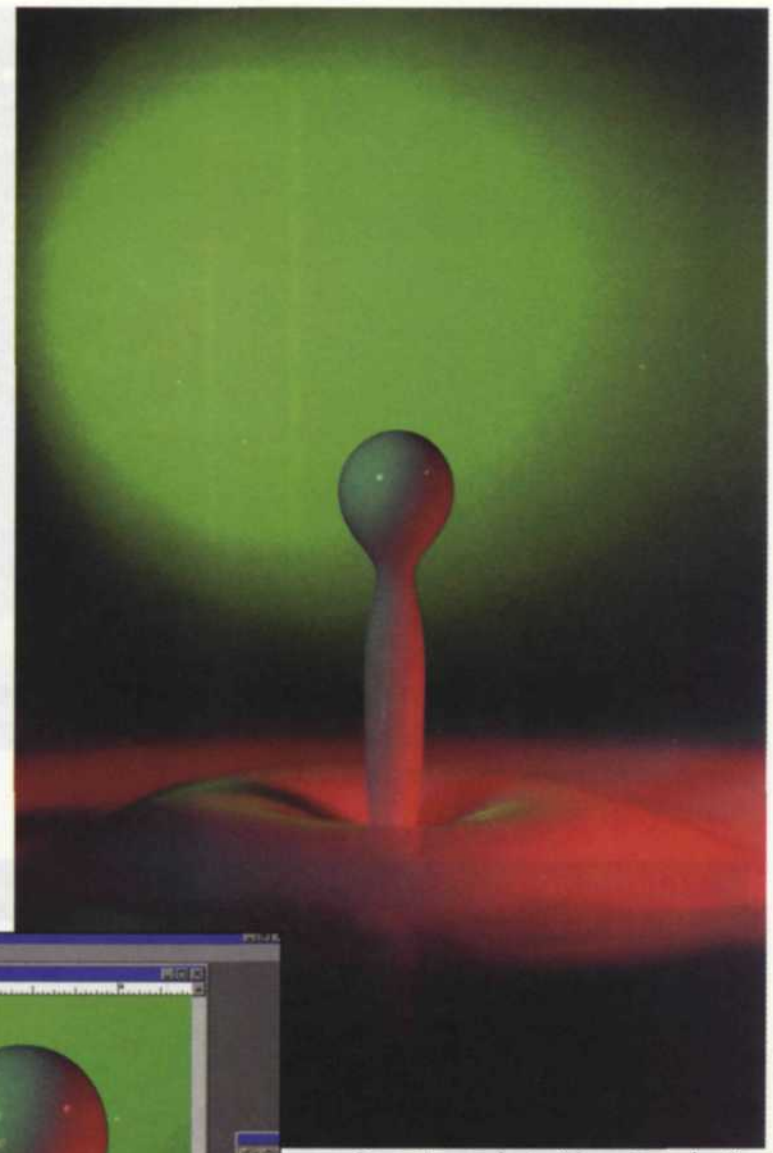
Reducing the grain in just a section of an image requires that you select the affected area. The fastest selection tool to make your selection is called the magic wand. You can control just how much area your magic wand selects by varying the setting control from 5–50. This setting tells the magic wand how many different shade pixels it should select. A setting of 5 will select the color you touched and a couple of shades on either side of the selection. A setting of 50 will select a wide variety of shades.



Original high-speed image with lots of grain in background



Using dust and scratches filter, and sharpen, in combination as an action to reduce grain.
Left: Before correction
Right: After correction



Same image but with grain reduction applied

If you use the magic wand to select the sky in any image and it also selects other parts of the scene, then you need to lower you selection setting. Reduce the setting until it selects about 50–70% percent of the sky. Using the "add selection," you can then select a slightly lighter or darker area to add to your selection. Eventually all the sky will be selected.

You may find some subjects in an image that have the same color and tone as the sky. If the magic wand accidentally selects these, don't worry because you can easily de-select that portion without starting over. Simply set the manual "irregular select" tool to subtraction, and manually de-select the area that is not sky. If the area to be selected has many tones similar to those unwanted areas, you may have to use the manual select tool for the entire process.

Another effective selection tool is the color range tool. It works very much like the magic wand tool but selects all colors in the image that are similar to the one you select.

There are also some third party masking programs that do excellent jobs of selecting specific areas in brightness and color. The Mask-Pro program is a plug-in filter for Photoshop that marks certain colors to keep and others to throw away when creating the mask. Corel KnockOut uses a similar approach selecting colors inside and outside the desired selection area.

The next step is to "feather" your selection away from the area you don't want to apply grain reduction. This step is absolutely necessary or there will be a obvious line between the treated and non-treated sections. You should be able to find the feather tool in the selection pull-down menu or in the masking section of your software. If you are given the option of feathering inside, center, or outside—select the inside function. This will feather the selection away from the main subject and protect its sharpness from the effect you are applying. The width of the feather will depend on the resolution of the scanned image. The higher the resolution the wider the feather. Generally we set the feather to 2 for 2k scans and 4 for 4k scans. (2k refers to an image that has 2000 pixels on the longest side. 4k refers to an image that is 4000 pixels on the longest side.) Every one has different tastes, so this one will take some experimenting.

Once you have a specific grainy area selected, and feathered, you can use any of the blur, dust and scratches, despeckle, or the median tools to smooth the grain pattern. You don't necessary have to re-sharpen the affect-

High-speed color negative image with grain in background

Same image but with grain reduction in background

Grain reduction (right) using dust and scratches and sharpen edges filters

Using median filter to soften selected area in background

ed area as you did when you reduced the grain in the whole image.

After you have a combination of filters that reduce grain to your specifications, you can simplify the process by creating an action that stores your filter combination. The next time you have an image with a grain problem, you can simply apply this action, and it will duplicate the same steps you performed on the earlier image.

When you first attempt grain reduction, there is a tendency to completely remove the grain from the selected area. The results may look great in the selected area, but the difference between the treated and untreated areas may look too noticeable. It will require some experimenting until you discover the right balance.

If you have performed grain reduction properly, it will not be noticeable. That *is* the idea, right? So, put away your bottles of grain reducer and jars of image sharpening fluid, and put your computer to work making short work of unwanted grain.

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