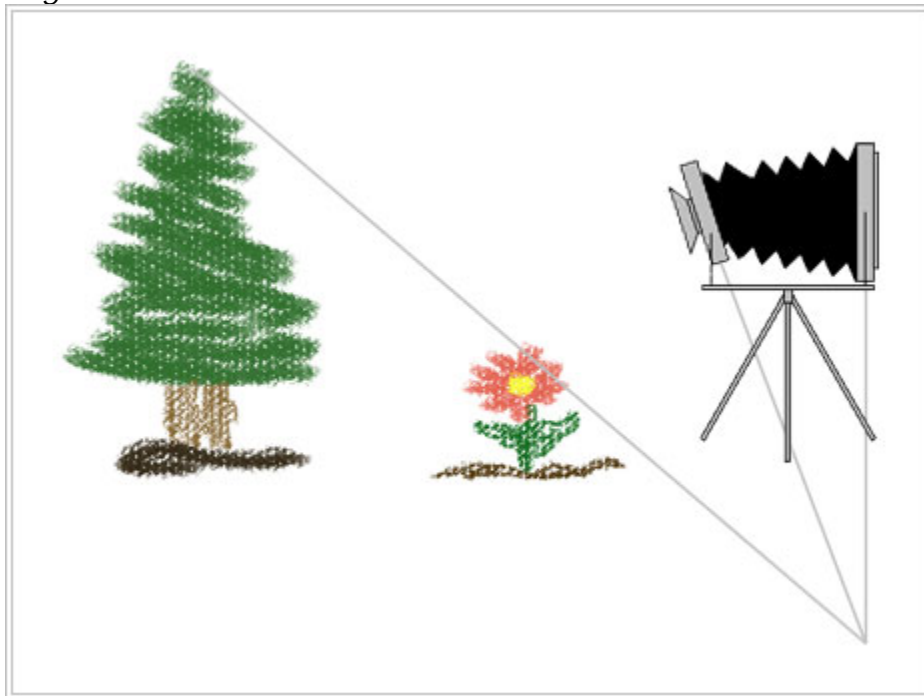


## Introduction

The Scheimpflug principle is used in photography to provide sharp focus where the subject plane, the lens plane, and the film plane are not parallel to one another. Roughly worded, the principle states that if the subject, lens, and film planes can be oriented so that they meet at a single point in space, then sharp focus can be achieved (*Figure 1*). Since the subject plane is essentially fixed for most photographs, the Scheimpflug principle is applied by changing the lens or film planes via tilts and swings. The view camera is particularly adept at these movements, and tilt-shift lenses are available for 35-mm cameras. Using the Scheimpflug principle, impressive image sharpness is possible even in scenes with significant depth-of-field.

*Figure 1*



In most SLR systems, however, the film and lens planes are fixed, so there is little opportunity to use the Scheimpflug principle. Depth-of-focus is generally accomplished with the f-stop (smaller aperture yields greater depth-of-focus) and knowledge of hyperfocal distance. Unfortunately, small f-stops also cause diffraction, which in turn leads to loss of image detail. Image sharpness for scenes with significant depth-of-field, therefore, can be a compromise in aperture size. An aperture too large leads to out-of-focus elements while an aperture too small causes the image to be less sharp and detailed.

Digital cameras seem to make the compromise even more evident. The super-clean, grainless pixels of digital capture emphasize the lack of focus produced from both inadequate depth-of-focus and diffraction. Because in-focus areas of digitally captured images are incredibly sharp, they make

areas of less-than-optimum focus more obvious by comparison. In images destined only for presentation on the Internet, the compromise is usually not an issue, but for prints with any degree of enlargement, the sharpness concessions from using a fixed lens and film plane can be quite noticeable.

"Digital Scheimpflug" is a term that describes using digital technology, Photoshop CS3 in this case, to achieve the ultra depth-of-focus possible when employing the Scheimpflug principle. While it has nothing to with changing the subject, lens, or film planes, it does take into account the different planes of focus of the subject and actually goes beyond what the mechanics of traditionally applying the Scheimpflug principle using tilts and swings can offer.

There are five steps to successfully exploit what digital Scheimpflug can do:

1. Take pictures
2. Bring images into Photoshop
3. Match pixels
4. Create masks
5. Trim edges

Each step is described on the following pages. While the techniques can be used with both digitally- and film-captured images, the discussion will focus on a digital work flow. Film-users simply have to scan their images and open them in Photoshop as the second step.