

Why do photographs of buildings sometimes make it look as though they are falling over?

The phenomenon

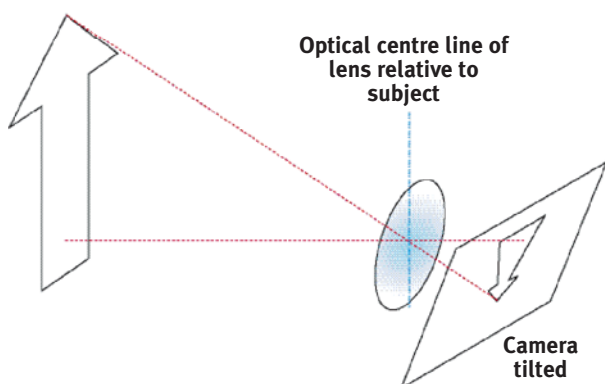
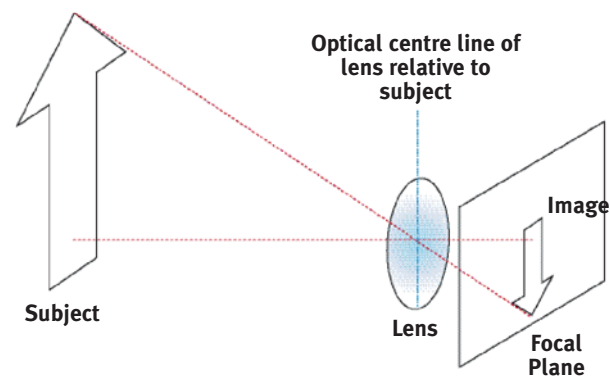
We've all seen pictures of buildings where the top of the building is narrower than the bottom making them look as though they are falling backwards, or a picture of a room where the walls seem to be closing in. These converging vertical lines are caused by perspective distortion, but what causes it and how can you avoid it?

The theory

Perspective distortion is a result of the position of the focal plane (which is where the film or CCD sensor is situated) relative to the subject and is largely influenced by the magnifying effect of the lens.

We all realise that the closer we get to an object the larger it appears, but did you know that conversely the further away from the centre of a lens the image is produced the larger it appears. When the focal plane is parallel to the subject, these two facts cancel each other out and the image appears faithful to the subject.

However, when we tilt a camera upwards to include the top of a building we move the bottom of the focal plane (top of the picture) closer to the optical centre of the lens relative to the subject. This gives less magnification for the top of the picture and



more for the bottom of the picture; the result is the subject appears distorted, having a narrower top and a wider base.

As wide angle lenses give bigger changes in magnification with small movements of the lens relative to the focal plane, tilting a camera with such a lens exaggerates the perspective distortion.

In practice

To minimise the effects of perspective distortion try to keep the camera as parallel to the subject as possible. If this means that you will chop off the top of the subject, try to gain some height, look around for somewhere to stand that will raise your position. When photographing a room pick a point on a far wall that is level with your eyes and place the centre of the viewfinder level with that point, the walls should then appear parallel.

Also, rather than use a wide angle lens standing close to the subject, try to move further away from the subject and zoom the lens to a more telephoto focal length. Alternatively use the extra foreground that a wide angle lens gives to lead into the picture and make it more interesting.

It is possible to correct perspective distortion in photo editing software such as Photoshop, but remember to leave some extra space around your subject to allow for cropping the picture square after you have finished working on it.



Tilting the camera upwards creates perspective distortion



Correct perspective by keeping the back of the camera parallel with the subject