

Where Did My Brother Stand When He Took This Photo?

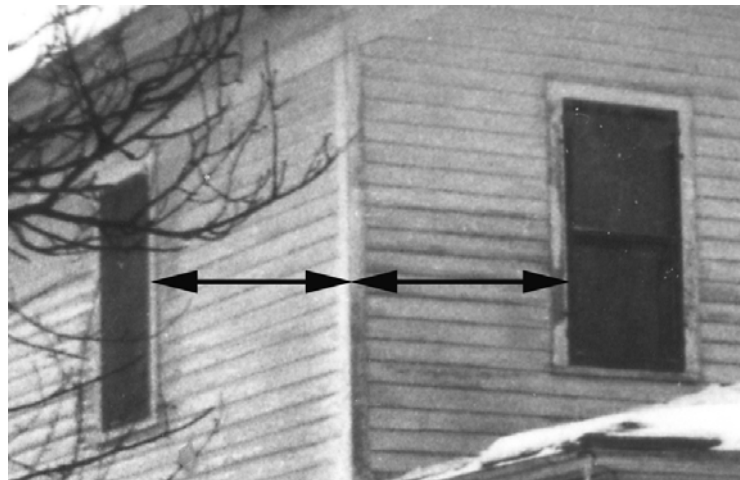
In 1944 my family, including me, lived at 8 East Main St. in Holcomb, NY. I have several photos of the house taken when we lived there. One of them, shown here, was taken by one of my brothers during the winter of 1944/45. Early this year, I decided to take a photo of the house that would match the one taken 70 years ago. The result was similar to the old photo but was not close enough to overlay and fade one to the other. I tried several times from different camera positions, moving left to right and closer and further away, with the same poor results. It would take dozens of trials to stumble on an adequate camera location.



Since my background is in mathematics, I figured that some theoretician somewhere had developed a formula to calculate where to position the camera when trying to match an existing photo. Sure enough, some work has been done in the area, but most of it has little practical application. One interesting article* in a mathematics journal presents formulas to calculate the camera position but the required input to get the solutions are five measurements from the existing photo plus two dimensions of the building. Using a couple of ideas from the article, I came up with a few steps that seem to cut down the trial and error process.

Looking at the photo of our house, one gets the feeling for the depth by perspective. If the new photo is to have the same perspective, I need to stand where my brother stood 70 years ago. First let's consider where to stand left to right before we consider how close to the house we should stand.

Step 1 - On the old photo use a ruler to find equal distances on two different sides of the house. These distances are best done between windows, corners, etc. The distance between the corner and the window hole on the side of the house facing the street is roughly equal to the distance between the corner and the window hole on the side perpendicular to the street. Note these distances are measured across

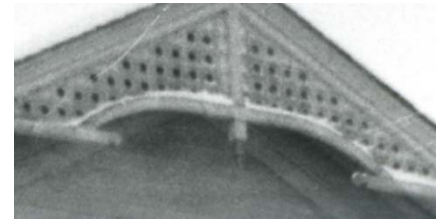


the photo not in the perspective directions. On the scene, we move right to left until these two distances appear equal when we view the actual house. I use a small mm ruler that I hold up to measure one distance and then the other to compare. Staying firmly in this right/left position we will next determine how close to the house to stand.

Step 2 - As we move closer or further away from the house we note that the porch posts positions change relative to the door and window behind them. Stop when you note that one post covers a small portion of the window and the other post does not cover any of the front door. Another check is the trim at the roof peak. Note the position of the three balls relative to the trim.



Step 3 - Make small movements right to left and closer to further away to best match the items in Steps 1 and 2. Then take five photos from that spot, one step closer, one step to the right, one step to the left and one step further away.



It's still trial and error but with a few guidelines. Unfortunately these suggested steps might not work at all. My brother took the photo with an inexpensive Kodak Brownie but if a view camera were used with its capability to alter perspective it's a game changer. Different focal lengths can also muddy the waters but I've found that in most of the situations I've tried, a short focal length of less than 20 mm is needed to encompass the scene in the original photo.

I've tried this on 60 some buildings and have been reasonably successful 80% of the time. There remain a half dozen or so stubborn cases that seem to elude an adequate solution even with the help of Photoshop. I'm still working on them.

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Paul D. Bullock
bullockpd11@verizon.net

*Math. Mag. VOL. 77, NO. 4, OCTOBER 2004, pp 251-259
"Where the Camera Was"; KATHERINE McL. BYERS and JAMES M. HENLE; Smith
College, Northampton, MA 01063
<http://www.math.smith.edu/~jhenle/Files/camera.pdf>

Here's the result compared with the original photo. Not perfect but not bad either.



To see the new photo morph into the old one, check out this YouTube video
http://youtu.be/KfvVbASgq_8