Calibration of the Microlens Array of a Plenoptic Camera

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The plenoptic camera is one of the most recent advancements in imaging technology today, capable of capturing the four-dimensional light field with just a single camera by using a microlens array. One of the important variables in the reconstruction of a plenoptic image is the distance between the main lens and the microlens array of the camera. While this value can be estimated by using the principle of magnification, the value given is only accurate to a certain degree. As seen in the above two images, even a slight error in the calibration phase can lead to a noticeable effect on the image quality. A calibration method is needed that will provide an accurate estimate for this distance and well as determine the precise orientation of the microlens array with respect to the image sensor.