

2.2.1 Rectification

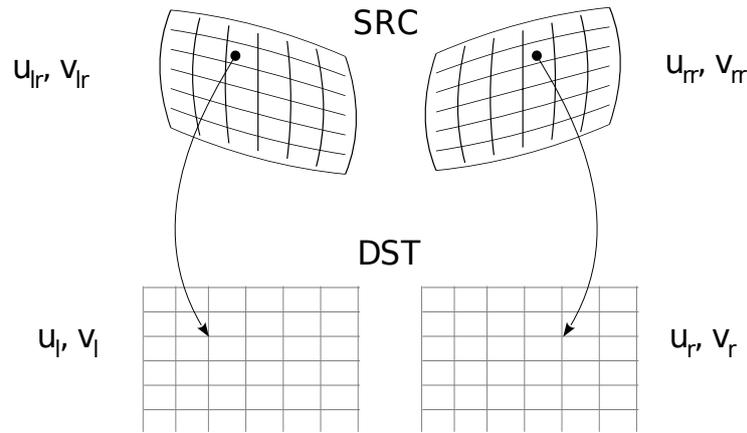


Figure 2.4: Rectification aligns epipolar lines co-linear to one of the image axis, allowing for more efficient matching. By applying a combined transform, rectification can also be used to remove lens distortion in a single transform operation.

Image acquisition and rectification are the first steps to be performed. Rectification results in all epipolar lines to become co-linear and parallel to one of the image axis (usually the horizontal one) [10], as illustrated in Figure 2.4. Therefore, corresponding pixels have the same v coordinate. This allows for matching candidates to be searched in the corresponding lines of the left and the right image, without complex traversal or transformation during the matching process, as shown in Figure 2.5. Furthermore, rectification allows for correction of distortions generated by the camera lenses. This can be achieved by combining the transformation maps of lens distortion correction and rectification into a single transform of an image.

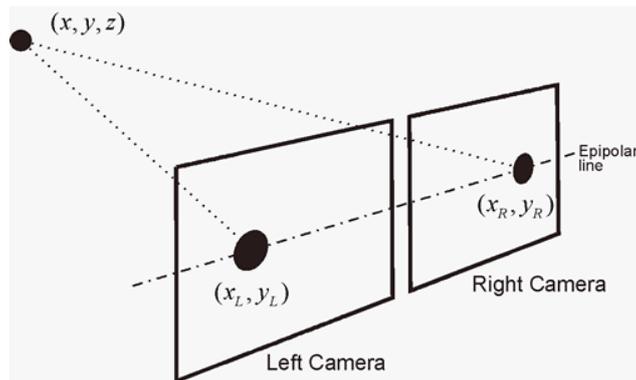


Figure 2.5: After rectification, all epipolar lines are co-linear and parallel the horizontal axis. Therefore, the search for corresponding pixels can be limited to a single dimension.

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