Thus, we have:

$$p = \begin{bmatrix} x_1 \\ y \\ x_2 \end{bmatrix} = \begin{bmatrix} 85 & 139 & 92 & 114 \\ 39 & -37 & -97 & -92 \\ -16 & 45 & -17 & 46 \end{bmatrix}$$

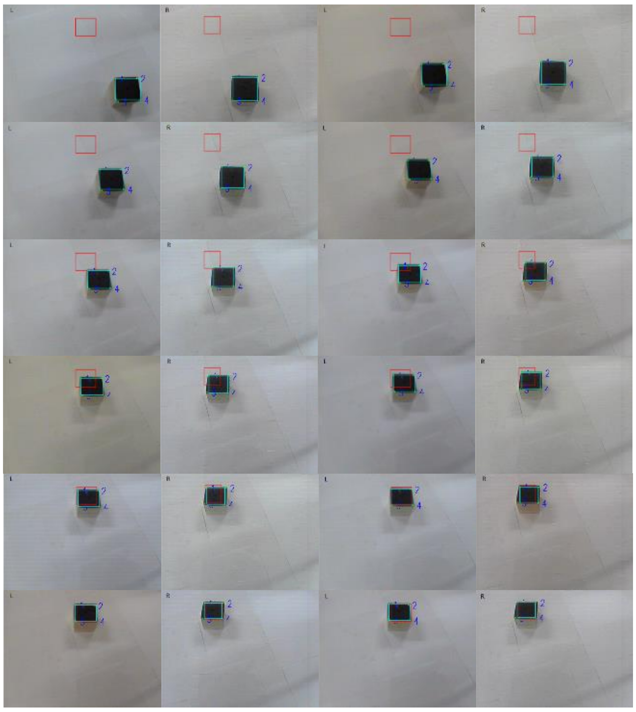

Figure 5. The image sequence captured by the binocular CCD cameras demonstrating the whole process of the visual servoing

The desired target image position (red square frame) and the initial image (green square frame) are shown in Figure 4. In the process of the visual servoing, the successive approximation images for the gradually approaching object are recorded in Figure 5. Obviously, the proposed algorithm can position the servo system.

5. CONCLUSIONS

Unlike monocular vision system, the binocular vision servo system eliminates the need for depth information. In practice, however, the estimation accuracy of image Jacobian matrix is affected by the unknown statistical features of process noise and measurement noise. In this paper, the SVDCKF is adopted to achieve a high filtering accuracy, and the BPNN is taken as a noise compensator to reduce the influence of the statistical features of uncertain noise to the filter. The proposed algorithm was proved as capable of completing servo positioning through an experiment on the Motoman UP6 robot experimental platform.

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