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New Scheme of Image Matching for The
Power Transmission Line Icing
Nalini Rizkyta Nusantara, Jin Xiao, Xiaoguang Hu
State Key Laboratory of Virtual Reality Technology and
Systems, Beihang University, Beijing, P.R China

THE PROPOSED ALGORITHM FOR IMAGE MATCHING

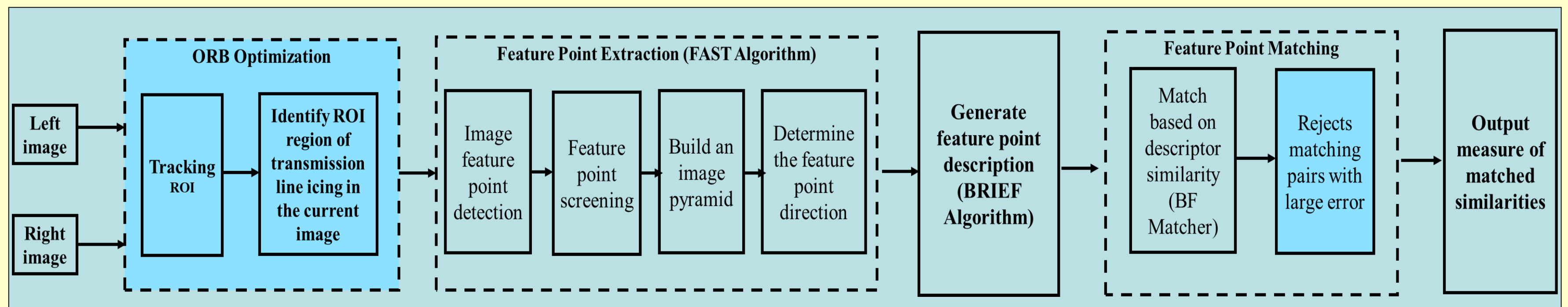


Fig. 1 The proposed scheme for image matching

The proposed method is a modification of the conventional ORB, which is added with the ROI algorithm to speed up computing and reduce noise from other things, and then a combination of BF matcher and KNN for error matching rejection. As shown in Fig.1, our proposed scheme for image matching is illustrated. Tracking ROI based on semantic segmentation results using deep learning, then identifying the ROI region of transmission line icing in the current image and eliminating the foreground and background. The image results proceeded through the ROI tracking stage for feature point detection input. BF matches are then combined with the k-Nearest Neighbors algorithm in case $k = 2$ conducted by experiment, which means that two nearest neighbors in the train image are found for each descriptor in the query image. It helps eliminate outliers, also as the ratio test by its simple selective principle.

EXPERIMENT RESULT AND ANALYSIS



Fig. 2 Image matching of our proposed scheme without point matching error

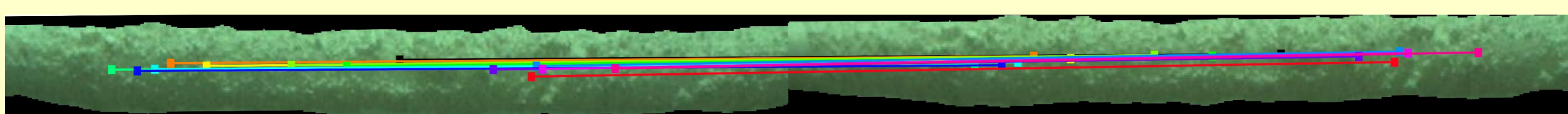


Fig. 3 Image matching of our proposed scheme with point matching errors

Colorful lines will indicate good matching in this proposed scheme. In comparison, a black line will indicate the error matching. The image matching experiment results from our scheme without point matching errors are shown in Fig. 2. While the observation in Fig.5 shows a black line at the top of the image matching line.

Summary

This paper proposes a new efficient scheme for image matching in the case of power transmission line icing. This paper analyzes the realization process of the conventional ORB algorithm and our proposed scheme to achieve feature image matching. The experiment in this paper used a power transmission line icing binocular image data set taken from our laboratory. According to the result, the proposed scheme achieves a 90% accuracy of the distance between the two correspondence points in the left and right image, the standard deviation error value is smaller than conventional ORB, and the number of point matching errors is less than conventional ORB. The average processing time is ten times faster than conventional ORB. Therefore, our proposed scheme is very effective for image matching in power transmission line icing and reduces errors and saves time.