

Development of a Highly-precise Inspection System for Railway Structures Using Image-Processing Techniques

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We have developed an image processing algorithm which detects cracks and diagnoses the degree of the soundness of the tunnel wall, the viaduct base plate, the handrail or slab track aiming at establishing a highly-precise and highly-efficient inspection system of railway structures. We propose the view on multiresolution analysis using the most appropriate resolution image based on the candidate deformation to be detected. Applying the technique of connecting adjacent image frames smoothly, we have developed a method of creating the high definition panorama image of a huge railway structure, and a technique of normalizing the distance in the track extension direction on the basis of a landmark. Furthermore, we have also developed a technique of grasping the progress of a crack from time-series images taken at different times. This paper reports those techniques with the image-processing result.