Basic Study on Crack Detection Method for PC Sleepers Using Deep Learning Model

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PC sleepers are an important component of railway tracks, contributing to the speed and safety of trains. In recent years, cracks have appeared in the longitudinal direction of some PC sleepers due to alkali–silica reactions, raising concerns about the efficiency of maintenance of these PC sleepers. Therefore, this study proposes using a deep learning model to estimate the position and length of cracks from top surface images of PC sleepers taken by a camera mounted on a maintenance vehicle. Examining the applicability of this method confirmed that this method can estimate the position and length of cracks on PC sleepers while preventing false detection of ballast and fastening devices. In addition, it was shown that this method can be employed to identify areas with a high concentration of cracks, as well as analyse crack patterns on commercial lines.