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Collision risk detection system between equipment and workers using CCTV on construction site

*Jaehwan Seong[1)], Hyung-soo Kim[2)] and Hyung-Jo Jung[3)]

[1), 2), 3)] *Department of Civil and Environmental Engineering, KAIST, Daejeon 34141, Korea*
[1)] kevin8633@kaist.ac.kr, [2)] rlagudtn@kaist.ac.kr, [3)] hjung@kaist.ac.kr

ABSTRACT

Accidents caused by collisions between equipment and workers accounted for a large proportion of deaths at construction sites, and the main reason for the collision is the poor visibility of the workers. This paper aims to reduce collision accidents by detecting and warning the risk of collision between construction equipment and workers in advance. The location of construction equipment and workers is estimated using a single CCTV installed at the construction site, and the access is determined. By applying an object-aware deep learning model to CCTV videos installed at construction sites, the minimum box and type surrounding each object are detected for all objects on each CCTV video frame. The ground surface of the construction site is flat enough to be regarded as a flat surface, and a homography matrix is obtained using the surface coordinates of four or more marking points installed at the construction site and pixel coordinates on CCTV to estimate the surface position of the construction equipment speed is calculated. The reduction of collision accidents is achieved by estimating the surface positions of objects set as workers, determining whether to enter the dangerous area and warning of the risk.

[1)] M.S Candidate Student
[2)] Ph.D Candidate Student
[3)] Professor

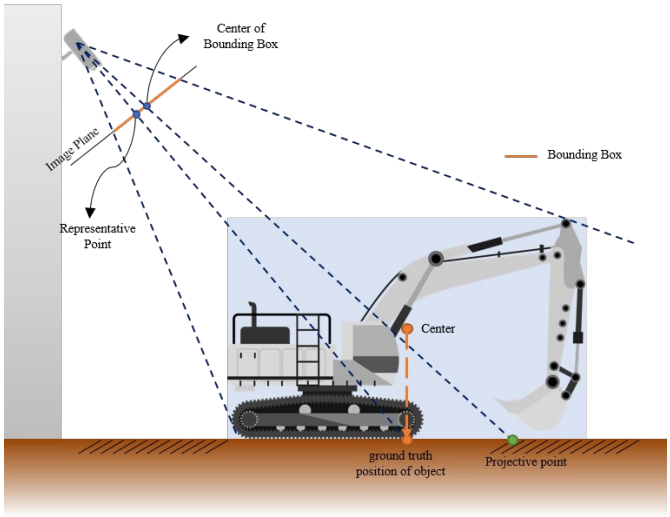

Fig. 1 The projective point of center of the bounding box

REFERENCES

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