World Academy of Science, Engineering and Technology
International Journal of Civil and Environmental Engineering
Vol:16, No:02, 2022

Automating 2D CAD to 3D Model Generation Process: Wall pop-ups

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Abstract : In this paper, we have built a neural network that can detect walls on 2D sheets and subsequently create a 3D model in Revit using Dynamo. The training set includes 3500 labeled images, and the detection algorithm used is YOLO. Typically, engineers/designers make concentrated efforts to convert 2D cad drawings to 3D models. This costs a considerable amount of time and human effort. This paper makes a contribution in automating the task of 3D walls modeling. 1. Detecting Walls in 2D cad and generating 3D pop-ups in Revit. 2. Saving designer his/her modeling time in drafting elements like walls from 2D cad to 3D representation. An object detection algorithm YOLO is used for wall detection and localization. The neural network is trained over 3500 labeled images of size 256x256x3. Then, Dynamo is interfaced with the output of the neural network to pop-up 3D walls in Revit. The research uses modern technological tools like deep learning and artificial intelligence to automate the process of generating 3D walls without needing humans to manually model them. Thus, contributes to saving time, human effort, and money.

Keywords : neural networks, Yolo,2D to 3D transformation, CAD object detection
Conference Title : ICBDACE 2022 : International Conference on Big Data Analytics in Civil Engineering
Conference Location : Amsterdam, Netherlands
Conference Dates : February 07-08, 2022