

# Utilization of the Three-Dimensional Model to a Construction Production System

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Received: 13 December 2019 Accepted: 2 January 2020 Published: 15 January 2020

## Abstract

The quitting a job of the expert worker and the lack of the technical transmission to the young worker with low birthrate, and the deterioration of the infrastructure institution which will increase rapidly in future will be the problem that must put up measures immediately in the construction business. CIM and i-Construction proposed by Ministry of Land, Infrastructure, Transport and Tourism enforce the improvement of the productivity of the construction site and the maintenance and check for the life cycle of the structure using three-dimensional model in order to solve such a problem, and they may be said that it is the big change of the construction production system. In this report, I survey three examples of the tool which I can utilize threedimensional model for plan, measuring, construction, and maintenance based on a policy of CIM and i-Construction, explain an effective making method of the three-dimensional model suitable for a construction scale and contents and examine the effective utilization method and introduction effect in the construction production system.

**Index terms**— CIM, information-oriented construction, laser scanner device, UAV  
 ??????????ç?"??????????ä ???"?????é?"? ?????"?????ç?"? 4)????????????? UAV ??????????????????éj?"??????????
 ???"?????ç?"????????????????? 5)??? UAV ?????????????????????????? ???????????????????????????
 ??????????ç?"????????????????? ??? 3 ?????????????????????? ?????????? 6)???MMS( Mobile
 Mapping System) ?ç?"?é?"????(??? ??????)????? 3 ??????????ç?"? ??? ?????????????????? ??????
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 ???"?????ç?"? 3 ??(????????? ??? ?????? ??????)????? a) ?ç?"»?????ç?"? ??? ???????
 ?????????????????????? ??? ??PC ???????ä ???"????? PC ?????? ?ä ???"????????ä ???"????? 2 ?????? ?
 3 ?????????????? ???æ?"-????? ???????ä ???"?????(-3? -4)? ??-1 ?????????? 1-3 ?????? ?-2 3 ??????
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 ???CIM ?????????ä?"?????-1 ? ?????????????????????? ?????"????? ?????"????????? ????6?"?????
 ä ???"????????????? 3 ?????????? ä ???"????????????? ???3 ?????? ?????????????? ?????????? 6 ???"?????UAV
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 2000?TOPCON ?) ?????????? ä ???"?????????é?"? ??????(?? 150m?? ? 40m)?????3 ?é?"? (????? ???
 30 ? )?????????3 ??????(?-1)? ? 3 ?????????????? 2 ?????? ?ç?"? 3 ?????????? 3 ?????????? ??
 ??????????(-2? ii. ?????? ?ç?"? 3 ?????????????? ??? 3 ?????????? ?????????? 3 ?????????? 3 ?????????ä ???"?
 36 ?????????????????????? ???é?"? ???æ?"-????? 3 ?????? ?ä ???"?????????????3 ??? ??ä ???"??????????
 37 2 ?????????? ??????????????ä ???"????? ?????????????????? 3 ??????????ä ???"????? ???????????
 38 ???"ae?"????????? ????"?????ä?"? ???"????????????????? ??????????ä ???"?????. ??????????ç?"?»????????? ???
 39 ???? 3 ?????????????? ??? 3 ?????????????? ?????? ??? 3 ?????? ?-3 ??pc ??? 3 ??? ?-4 b) ??????????ç?"??
 40 ??????? i. ?????? 3 ?????????? ?????????????? ??? 31ha? ??? 76 ? m3????? 63 ? m3 ?
 ??????????????i-Construction ?? ??????ä??"? 3 ?? ?????????? ??????????ç?"? ?? ?????????? (?-5)?
 42 3 ?????????????? ??? ??"é?"?????ä ???"????? m3 ? ??? ?????? cm ??????ä ???"????? ???"±??
 43 UAV ??ç?"? (??-2??-2)?UAV ? ?????? ??????????????ç?"? ???"????? ?????????(??-3??-6)? UAV ???????
 44 ?????????????? ?????????? ? 3 ?????????? ?????????? ?????????? 3 ??? ????(?-7)?UAV ? ??? 3
 45 ?????? ?æ?"????????? ?????????? ?????????? (??-8)? ?????????? ??????????ç?"?»?????ä ???"?????. ??????????????????

46 ????? ?(?? 29 ? 12 ?)????? 2 ?(?? 40?????? 70???)?UAV ?????????? ??????? ??UAV ?????????????? 3  
47 ? ??? ? 2 ?????????????????????? ??? 3 ?? ???????ç?"?? ?????????????????????? ? GNSS ?????????â?"??  
48 3 ??????? ???????ä?"??ä½?"????????? ?????????????????????? 3 ??? ??????????????????ä½?"?????????  
49 ?????????? ?????????????????? ?????????????????????? ?????????????????????? ??????????????????????????  
50 ?????é?"????????????????? ???(??-4??-5)? ?-5 ????? ??-2 UAV(SPIDER CS6) ?-2 UAV ??(SPIDER CS6)  
51 ? ? ? ? ä½?"?? 3,800? ??? 1,000×1,000×400mm ? ? ????? ? ? 15m/s ?? ???é?" 10 ??25 ? ??? ?  
1,000m?é?"???



Figure 1:

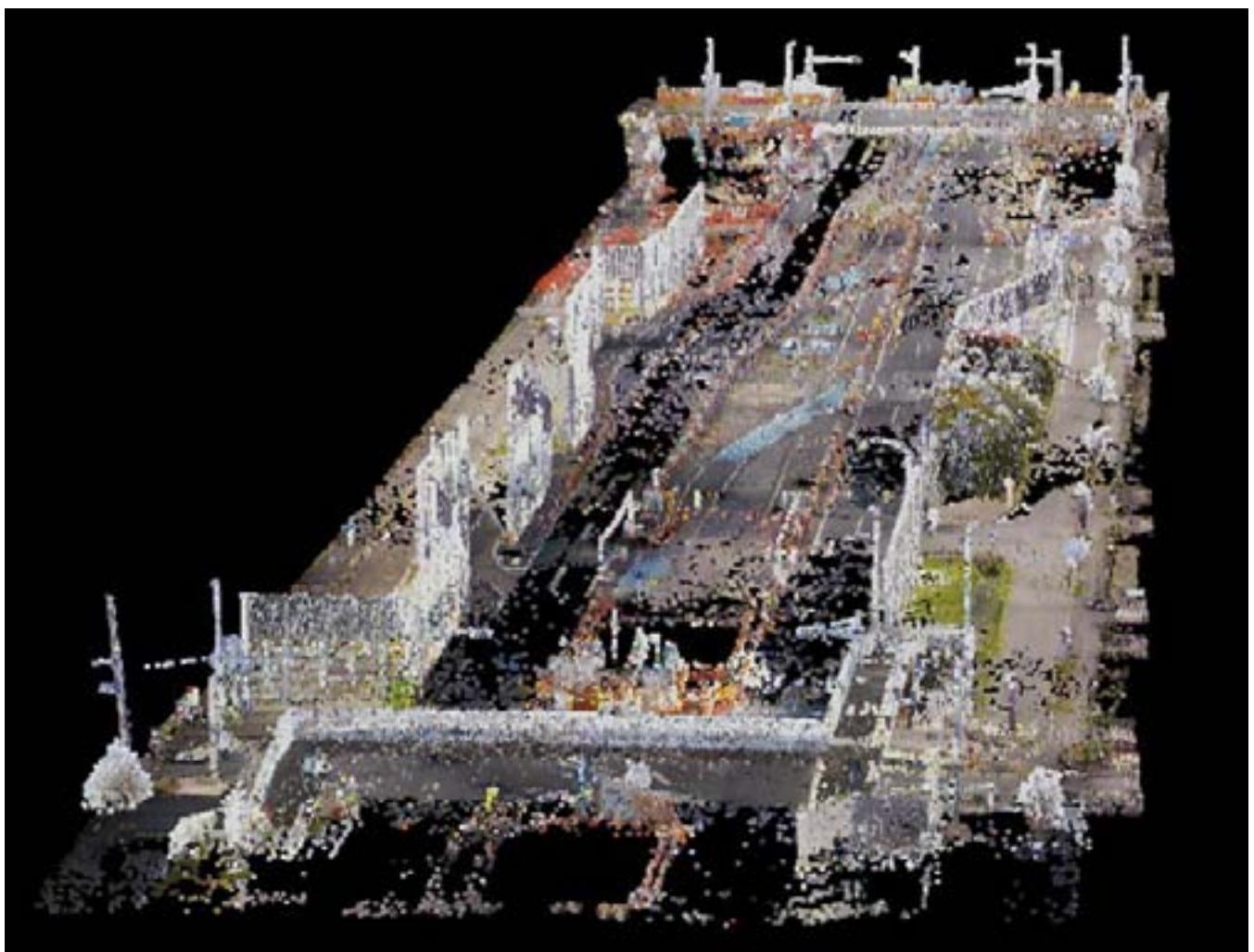


Figure 2:

