Using of Laser Scanning Technique to Culture Heritage: the Sample of Kizkalesi

Murat Yakar and Ali Ulvi (Turkey)

Key words: Laser scanning; kızkalesi

SUMMARY

The aim of this study is to show that cultural heritage, relievos and silhouette projects Located in study area can be produced by 3D terrestrial laser scanners. In addition, used a large number of information in different ares based on these datas.In this study, the dimensional model of Kızkalesi has been done by using topographic laser scanning techniques. Check points were measured with Total Station, to prepare Relievo Project and to create 3 dimensional point datas. Laser scanning operation was done with the device Trimble GX3D and point cloud. CASE STUDY This work forms 2 phases that they are the works of terrain and bureau. Our terrain working was formed with preparation before work, coordinatement of check points with total station and attachment them, and field scanning with laser scanning tool. Field work is five days and Office work is twenty five days. RESULTS OF SCANNING Laser scanning was done with Trimble GX 3D laser scanning from 25 different station and with 1,5 cm space. Every scanning was done at least 4 linkups in mutual areas. Coordinates of points (30.374.829 adet) obtained from scanning, were transformed general coordination system. Considering coordinate differences and their standard deviations, t-test was applied to coordinate differences obtained from manual method if it is meaningful or not. Calculated test sizes were given in Graph 7. These values were compared with limit value in t-chart and with degree of freedom (f=n-1)and a=0.05 mistake possibility, t-test limit value is 2.05.(for f=30-1=29 degree of freedom and a=0,05 mistaking possibility) When the graph 7 is analyzed, it is seen that all test values are seen under limit value. Tx=Vi/Sxi Ty=Vi/Syi Tz=Vi/Szi 200 1.273 -0.883 -0.68737 201 1.206 -1.232 0.737557 204 -0.853 0.755148 -0.58019 205 0.756 -0.35695 -0.38567 207 -0.987 0.211787 1.372945 215 -0.474 -0.39978 0.967545 210 -0.743 -0.36542 -0.50537 227 -0.355 -1.25638 -1.01357 231 -1.150 1.233465 -1.386 233 1.500 0.491458 -1.01951 244 -0.794 0.416431 -0.44993 246 -0.463 -0.45519 1.337721 251 -0.801 -1.57506 0.816851 254 -0.868 1.1093 -1.1801 256 1.607 -1.26374 -1.09232 316 1.259 -1.18808 0.770196 320 -1.333 1.178954 -0.90581 322 0.818 -0.53643 -0.2782 325 -0.990 0.233546 1.514005 330 -0.541 -0.45603 1.024853 343 -0.793 -0.38999 -0.67419 350 -0.729 -1.84215 -1.06152 357 -0.896 1.174873 -1.11706 360 1.476 0.483524 -1.00305 363 -0.745 0.549051 -0.47458 367 -0.590 -0.57995 1.503853 377 1.054 -2.21045 1.074722 383 -1.001 1.503139 -1.48486 387 1.178 0.365624 0.758472 394 -0.691 0.453036 -0.31327 CONCLUSIONS Today, it is important to have visual information and a three-dimensional model which is fast and complete at minimum cost. Therefore, we need to collect lots of data quickly, in order to use of three-dimensional information for various purposes. Especially, usage of this method, which begins to have an important place at the engineering field,

become widespread gradually, and provides good advantages in terms of time, cost and labour for users. As a result of this study, we concluded that laser scanning measurements have sufficient sensitivity for the protection of world cultural heritage assets and the information obtained from such measures can be used in interdisciplinary studies.