UTM

UNIVERSITI TEKNOLOGI MALAYSIA

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VR SIMULATED SURVEY TRAINING SYSTEM

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INTRODUCTION

What is Virtual Reality (VR)? VR is the use of computer technology to create a simulated environment. In contrast to typical user interfaces, virtual reality immerses the user in an experience. Users are immersed and able to engage with 3D worlds rather than viewing a screen in front of them. The computer is transformed into a gatekeeper to this artificial world by replicating as many senses as possible, including vision, hearing, touch, and even smell. Virtual reality is already widely used, and many industries using it to train and prepare for real-world circumstances. For example, VR application is being used in education, military, medical training, sport, and fashion.

Furthermore, this task is implementing the use of virtual reality in GPS surveying with advance technology for simulating a real field work with software. The main platform to complete this task is Digital Mapping software introduced by SOUTH company. Digital Mapping Simulator is a software program that was created with a VR-based goal of implementing. This programme could give users access to a variety of surveying methodologies as well as precise surveying equipment functionality. The software will be used in this report on how to collect data from GPS observations and how to use actual instrument GPS and ground surveying instruments.

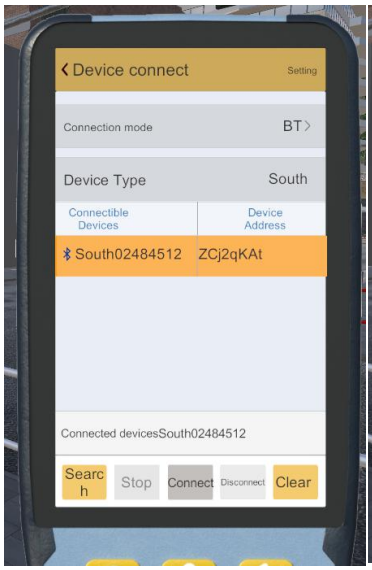
PROCESSING PROCEDURES

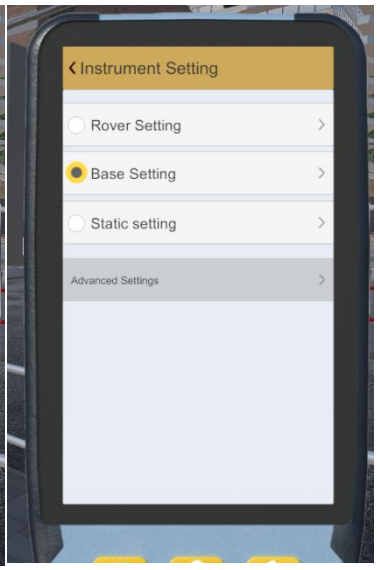
1. Setting up the instruments.

Firstly, we setting up the base on the roadside with instrument height 1.5.

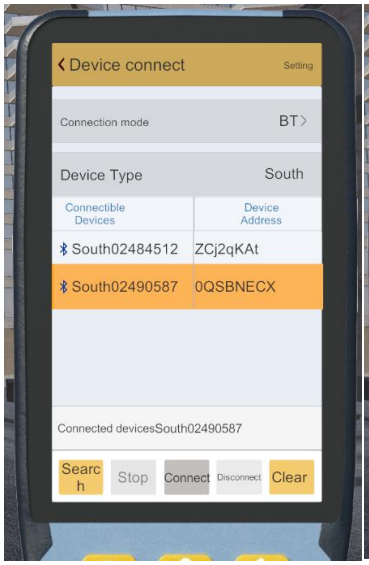
Power on to operate the base.

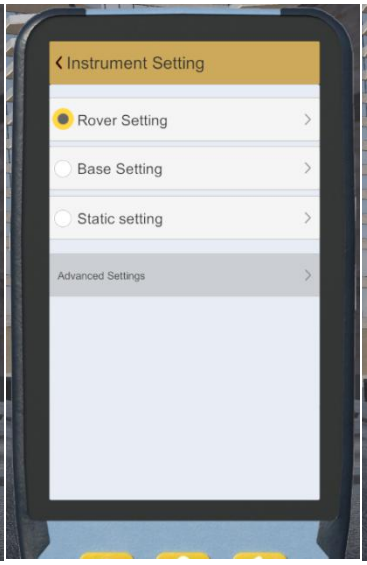
Bring out the controller to configure the base. Create a new file to store the collected data afterwards and connect to the device. The coordinate system is CGCS2000 which is the China coordinate system.

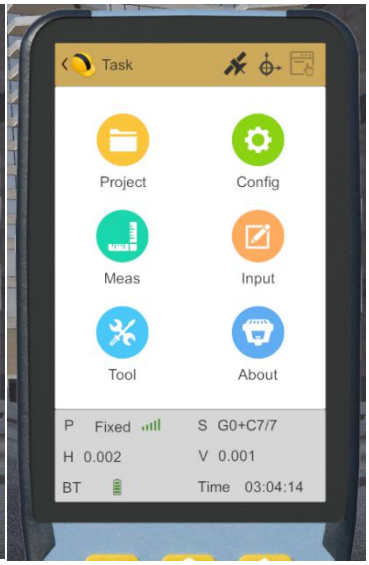




The same steps are repeated to setting up the rover.



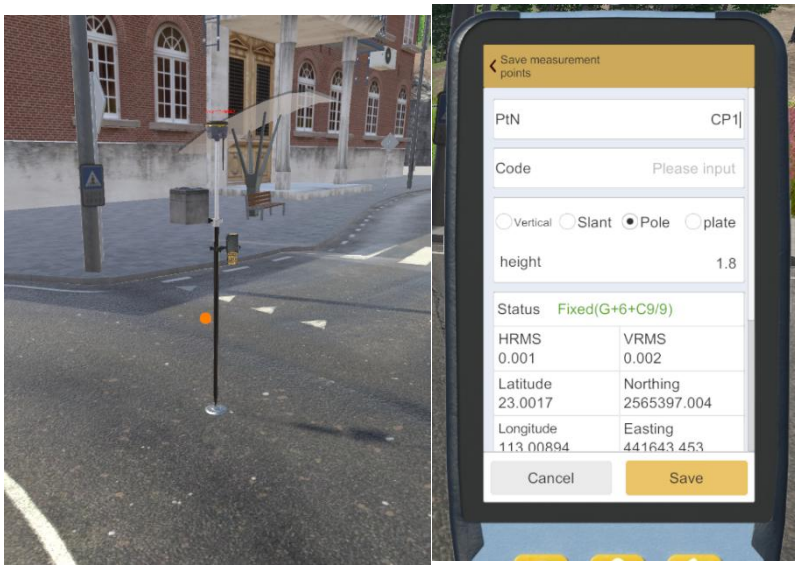




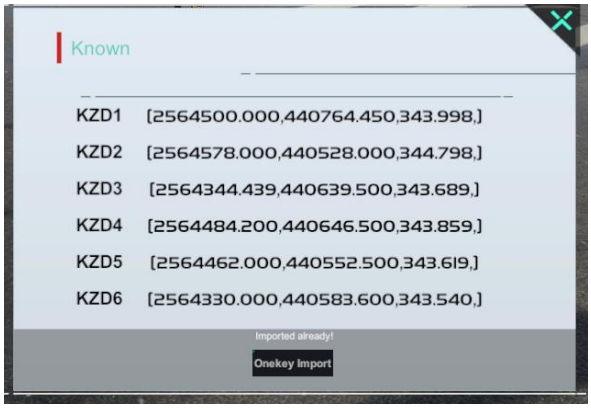
2. Collecting the point data.

This is the area for this Virtual Reality Simulation task. we are focusing on this area to collect the GPS data for mapping.

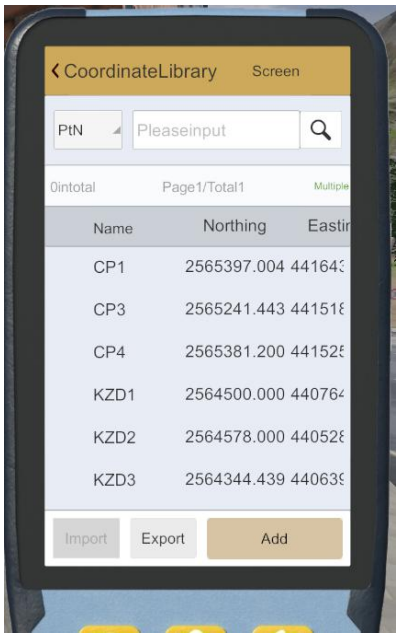
Place the rover at point KZD1 first. Then, start to operate the controller and measure the point and save as CP1.



Repeat the same steps to collect the data at point KZD3 and KZD4. After done with collecting the data from these points, import the known point to matching the data.

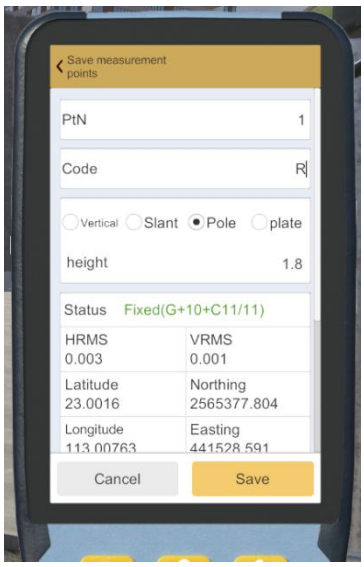


Alternative way: Use another control point (KZD2) to verify if the parameter is correct or not by checking the Northing, Easting, Height, Long and Lat, and Ellipsoid height.

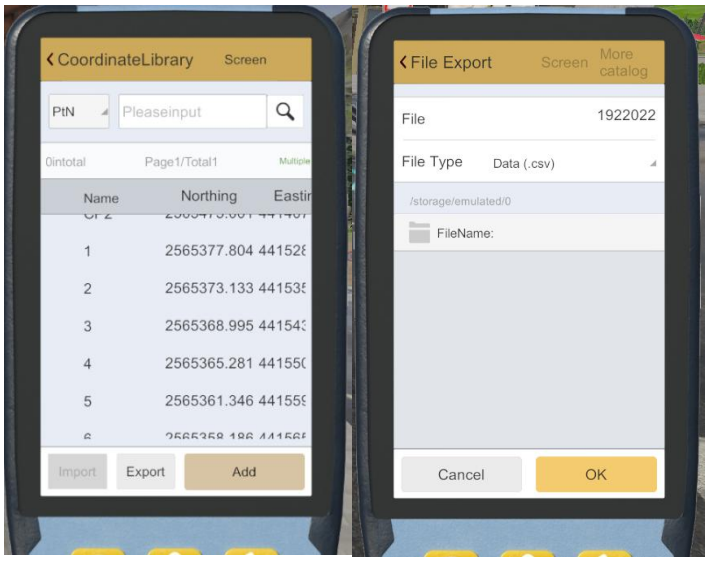


3. Measuring the point for road and building of target area.

Start with measuring the point along the road and then the edge of building. The step is same as measuring the control points by using the rover and controller. The code for road is R and building is B.



After finish with collecting the points, export the file data into .csv file format.



Convert the .csv file to .dxf file using Microsoft Excel to format the data to Point No. Northing, Easting, Elevation, and Code.

Once completing with converting the file to .dxf, this file will be the used to map out the area of target using AutoCAD software.

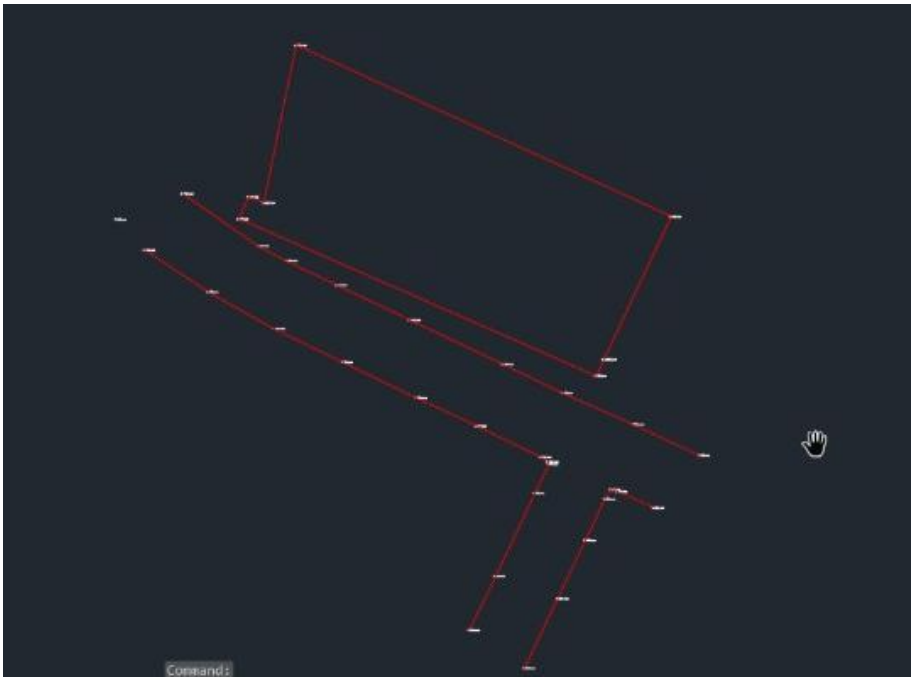
RESULT

The final result of this report is in .dxf AutoCAD files and the 37 points exported points.

Point	Code	N	E	Height
CP1		2565397.004	441643.453	1149.998
CP3		2565241.443	441518.503	1149.689
CP4		2565381.2	441525.503	1149.859
KZD1		2564500	440764.45	343.998
KZD2		2564578	440528	344.798
KZD3		2564344.439	440639.5	343.689
KZD4		2564484.2	440646.5	343.859
KZD5		2564462	440552.5	343.619
KZD6		2564330	440583.6	343.54
CP2		2565475.001	441407.001	1150.798
1	R	2565377.804	441528.591	1149.932
2	R	2565373.133	441535.702	1149.936
3	R	2565368.995	441543.088	1149.918
4	R	2565365.281	441550.739	1149.864
5	R	2565361.346	441559.018	1149.821
6	R	2565358.186	441565.615	1149.83
7	R	2565354.72	441572.849	1149.819
8	R	2565354.189	441573.665	1149.813
9	R	2565353.891	441573.712	1149.818
10	R	2565350.684	441572.195	1149.811
11	R	2565341.404	441567.763	1149.756
12	R	2565335.389	441564.922	1149.712
13	R	2565331.17	441571.086	1149.724
14	R	2565338.943	441574.769	1149.799
15	R	2565345.438	441577.881	1149.786
16	R	2565350.023	441580.065	1149.789
17	R	2565351.111	441580.714	1149.787
18	R	2565350.883	441581.412	1149.792
19	R	2565349.052	441585.49	1149.781
20	R	2565354.887	441590.616	1149.77
21	R	2565358.355	441583.225	1149.797
22	R	2565361.851	441575.356	1149.82
23	R	2565365.027	441568.671	1149.839
24	R	2565370.006	441558.244	1149.885
25	R	2565373.872	441550.071	1149.894
26	R	2565376.583	441544.493	1149.931
27	R	2565378.228	441541.305	1149.935
28	R	2565384.083	441532.841	1149.937
29	B	2565381.254	441539.091	1149.933

30	B	2565383.727	441540.196	1149.907
31	B	2565383.054	441541.967	1149.921
32	B	2565400.626	441545.52	1149.861
33	B	2565381.534	441587.412	1149.9
35	B	2565365.606	441580.199	1149.808
36	B	2565365.572	441579.941	1149.804
37	B	2565363.793	441579.064	1149.769

Figure below shows the final result of 2D view of road and building after each point collected are connecting by polyline using AutoCAD software.



CONCLUSION

Nowadays, pandemic forced students to learn online and it is difficult for students to get a proper survey training at field. However, virtual reality can be used as an educational purpose that is compatible with today's technology. Virtual reality technologies can help students learn more effectively and can be used to improve their learning and engagement. VR education has the potential to change the way educational content is given and it is based on the creation of a virtual or imagined world that allows users to not only see but also interact with it. Immersion in what we're learning encourages us to fully understand it. The information will be processed with less cognitive load.

In conclusion, we as GIS students which also learn surveying able to carry out to collecting the data and processing the GPS data effectively using Digital Mapping software. It not only has the capability of real-time instrument configuration, but it also has the capability of exporting data to our local. As a result, as part of the new norm in teaching methods, this would be the best experience that the university could provide for students, allowing them to use real-to-simulated surveying procedures.