

HOW TO CONTROL OBJECTS VISUALIZATION IN THE VR ENVIRONMENT USING MICRO-SIMULATION

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This project application is to use the Micro-simulation player of the VR Design Studio program to visualize any schedule in the construction order of a certain building/s. The Micro-simulation player includes two functions: the time-slider and the XML code. Both of the two functions control the visualization of the building construction. Changes can be made easily to the XML code to apply any change in the construction order.

Adding certain images and textual data to the visualization process would enrich and improve the VR visualization. Images and textual data can be linked to a certain space or zone in the visualized model, therefore when camera reaches a certain space the information related to this certain space would appear in the VR environment. This addition would enrich and improve the visualization process more.

Working Steps

1- Objects that will be controlled in visualization are modeled using any computer modeling program (3ds max, AutoCAD, etc). Then, those objects should be imported into the VR Design Studio program.

2- XML code is created to have the following items:

- Simulation (Units and Frames), Figure 1:

- More than one frame can be used.
- Time (frame start) and Length (frame length in seconds).

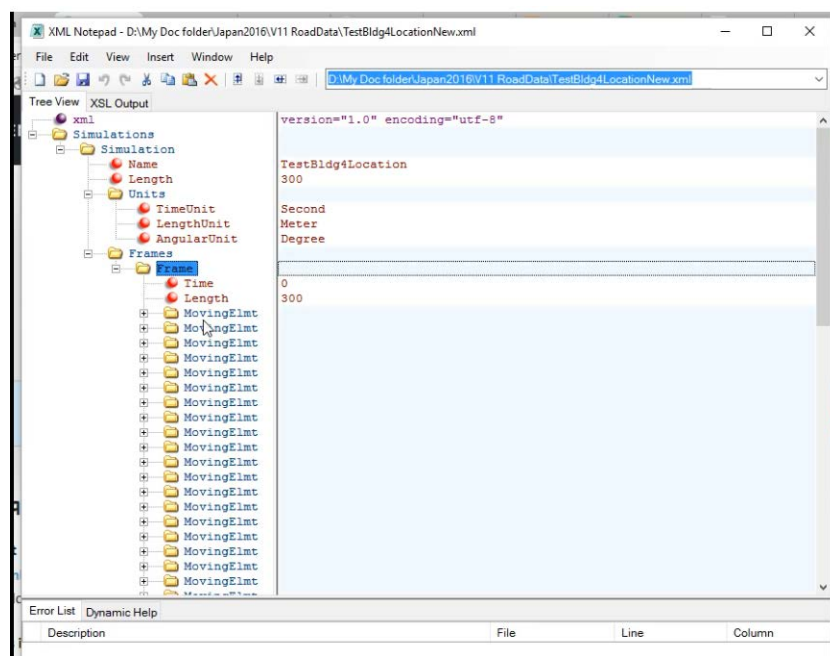


Figure 1

- Objects will be named in the XML code as MovingElmt.

3- Each MovingElmt has an ID, a Type and a Name, which are used in both XML code and the VR Studio program. Type and Name are the same; there is no need to make them different in this application.

4- Under MovingElmt, there is ST that has three variables: T (time in seconds), P (position in x, y and z), and D (direction and angle), Figure 2.

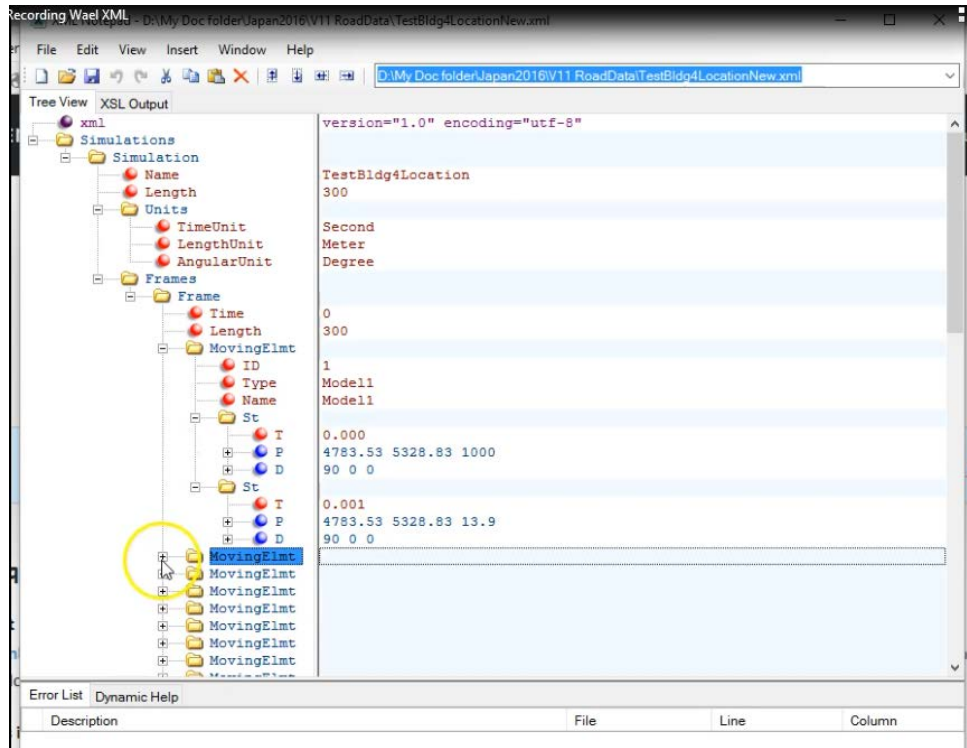


Figure 2

5- In order to visualize the object moving in a certain time range or within a certain position range, the object's values of T (time) and P (position) are used.

In other words, an object would appear to move from one position to another, or from one position to another, by controlling the values of T and P.

6- In the application of construction visualization, two values of each T and P are added, so that the object (a construction part of a building) would be visualized from a certain time at a certain position to another time value at another position's values.

7- Images and textual data can be added to the VR Design Studio program by the same method.

8- In Figure 3, each image will be visualized as an `ImgElmt`. The `ImgElmt` has an ID (number), a Type (related to a certain zone or space), an `ImgLocation` (location in the computer), and Description (image or another type).

9- For each `ImgElmt`, P (position in X, Y and Z) and A (area in X, Y and Z) are specified, so that when the camera reaches the target position (a certain zone) the images related to this zone will pop up.

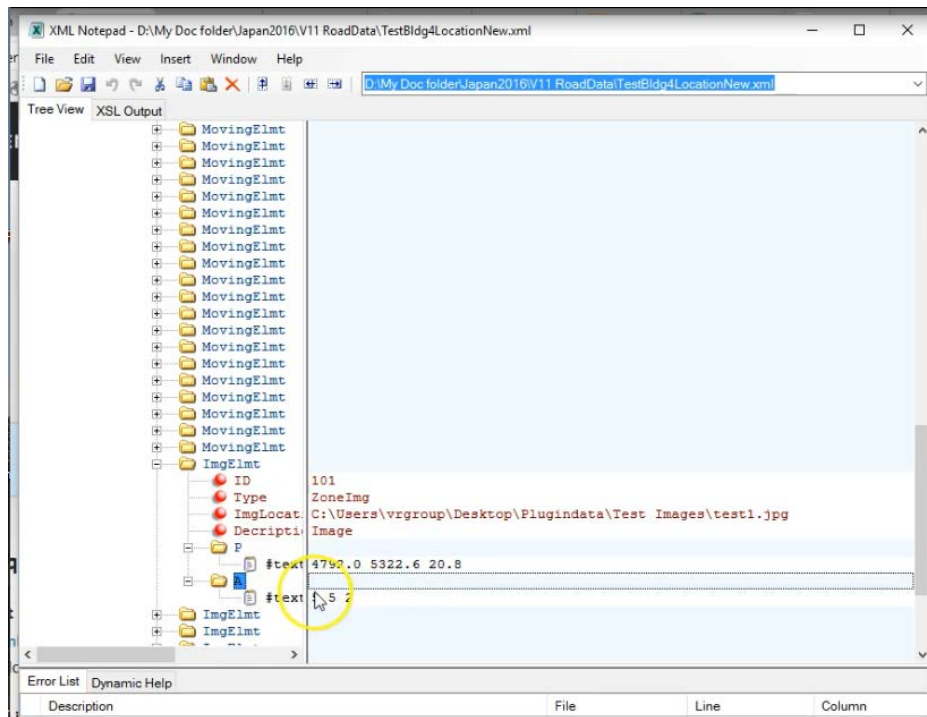


Figure 3

Questions:

1- What are the variables needed in the micro-simulation function to control the object visualization?

2- In case of having three objects in the camera view:

- Make one disappeared from the camera view by only using the Time variable. (True or False)

- It is possible to make all objects disappear in the camera view, then appear again after a certain time. (True or False)

3- In the previous case, describe the process and the variables used to do such task for one object:

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4- Is it possible to change the order of construction from one building to another building while having those buildings in the same camera view? (Yes or No)