3D Visualize Moving Objects in Secondo

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1. **Download the Java3D library from the following website:**

   $https://java3d.java.net/binary-builds.html$
   You can select the library according to your system platform, e.g., Linux, Windows, Mac OS X. (We hava tested on Linux-64bit and Windows-64bit. In the attachment, we put the two libraries.)

2. **Install the Java3D library.**

   First, unpack the library file and it generates a directory "lib". There are two subdirectories in $j3d-jre/lib/$, called "ext" and "amd64".
   Second, locate the Java directory where the system or Secondo uses. For example, $/usr/java/jdk1.8.0$ or $secondo-sdk/jdk1.8.0$. Then,
   1) copy all file in Java3D directory $j3d-jre/lib/ext$ into $/usr/jdk1.8.0/jre/lib/ext$;
   2) copy all file in Java3D directory $j3d-jre/lib/amd64$ into $/usr/jdk1.8.0/jre/lib/amd64$;
   (We have tested on JDK1.8. We highly recommend using JDK1.8. The earlier versions may have some exception when compiling.)

3. **Add MObjectViewer into Secondo.**

   1) Edit file "makefile.viewers" in $secondo/Javagui/viewer$. Add the following two lines:
   VIEWER_CLASSES += MObjectViewer.class
   VIEWER_DIRS += mobject
   2) Unpack the file "m3dviewer.tar.gz" and it generates a directory "mobject" and a file "MObjectViewer.java";
   3) put file "MObjectViewer.java" into $secondo/Javagui/viewer$;
   4) Put directory "mobject" in $secondo/Javagui/viewer$;

4. **Compile java files in secondo/Javagui.**

   Please compile the new viewer(MObjectViewer) in Javagui if you want to visualize moving objects.

5. **Execute query commands.**

   Must query the index (such as r-tree) to determine the spatio-temporal range before visualize other objects. For example, in the attachment, we add the test data for users. You should copy all files and subdirectories in *test* to *second/bin* if you want to test the MObjectViewer. In the directory *test*, we put the script file "$import-object.sec$" to import single formatted object data, which is in subdirectory $TaxisTemp$. In addition, the file "$alltaxis0708$" and "$alltrajs0708$" store the all moving objects relation and all trajectories relation respectively. In the directory *test*, we put the script file "$demo-operation.sec$" to import and visualize the relation "$alltaxis0708$" and "$alltrajs0708$".