

# Introduction to VRML'97

Course at GraphiCon'98  
Moscow, Russia

## EXERCISES

The following 6 exercises are recommended as a „homework“ for practising.

## Exercise 1

### VRML Files

1. Type in the example VRML file given in the tutorial slides and save the file as *example.wrl*
2. Use a VRML browser to show *example.wrl* on a computer screen
3. Color the object green. (Hint: Look at the VRML specification at <http://www.vrml.org> and find out which fields the Appearance node has).
4. Play with the VRML browser and try its features

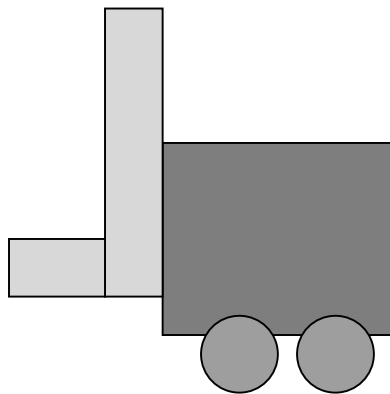
## Exercise 2

### VRML Modelling

Model a simple forklift truck using the predefined geometries *cube* and *cylinder*.

The forklift truck should consist of the following parts:

- one chassis ( using one cube )
- one fork ( using two cubes )
- four wheels ( using four cylinders )



## **Exercise 3**

### VRML Animation

1. Animate the forklift truck: it should drive 10 times its length in 7 seconds periodically
2. Animate the wheels: they should rotate while the forklift truck is driving
3. Animate the fork: the fork should lift after the forklift truck has travelled half its way.

## Exercise 4

### Background, Viewpoints, Prototypes

1. Define a background for the forklift scene: there should be a blue sky being white at the horizon and the earth should be brown.
2. Add viewpoints to the scene and name them. One viewpoint should be in front of the forklift truck. One viewpoint should show the forklift truck from above. One viewpoint should show the forklift truck from the side
3. Put a billboard on a green cube beneath the forklift truck with a text „MY FORKLIFT TRUCK“. The billboard with green cube should be defined as a PROTO, in the interface there should be a field „b\_text“ for handing a text to the PROTO.

## **Exercise 4**

### VRML Sensors

1. The forklift truck should only drive forward if you click on it.
2. The billboard should only be visible if you view it from a 1.5 m distance. (Hint: Use a Switch node and a ProximitySensor node).

## **Exercise 5**

### Java Scripting

1. Add a Java script to the scene that is linked to the script via a Script node: if the forklift truck is clicked the first time, the fork is lifted. If the forklift truck is clicked the second time, the fork is lowered. If the forklift truck is clicked a third time, the fork is lifted again and so on.
2. Modify the Java script: if the forklift truck is clicked for the third time, a new forklift truck is created and placed into the scene. In addition, the text on the billboard is changed to „TWO FORKLIFTS“.

## **Exercise 6**

### The VRML External Authoring Interface EAI

1. Write a Java Applet which consists of a button named „Forward“. If the button is clicked the word „Forward“ is written to System.out.
2. Write a HTML page where both the forklift scene and the Java Applet are integrated.
3. Extend the Applet using the EAI: If the button of the Applet is clicked the forklift truck drives forward.
4. Extend the Applet using the EAI: If the forklift truck is clicked in the VRML scene the name of the Applet button is changed to „Backward“.