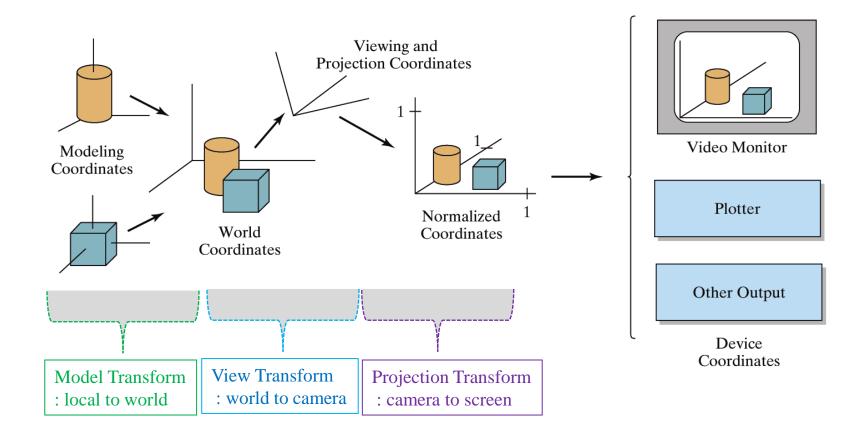
Model View Matrix and its implementation

Sang II Park

Department of Software Sejong University

OpenGL Geometric Transformations

Consecutive Transformations in OpenGL Pipeline



Topics

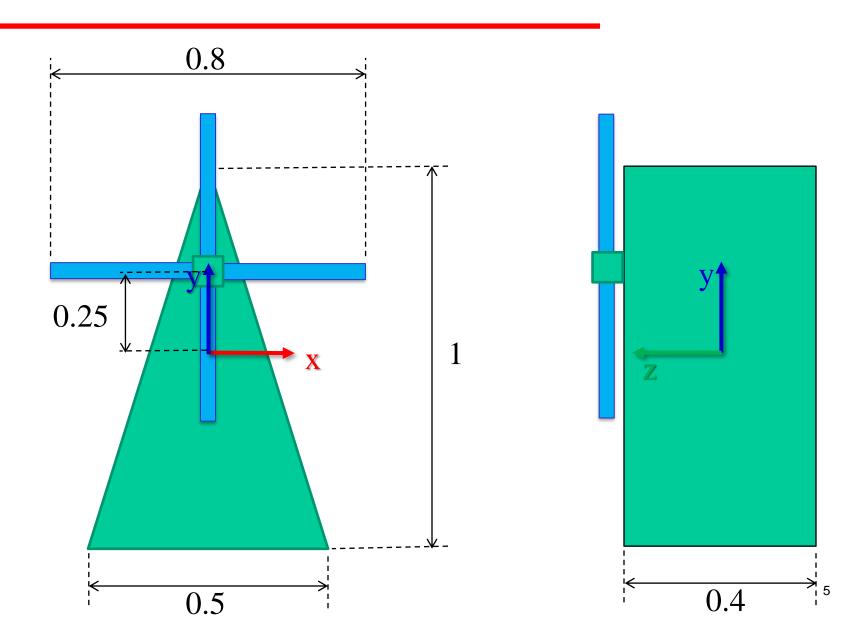
- Local to World Coordinate Transform
- Camera Positioning

Instance Transformation

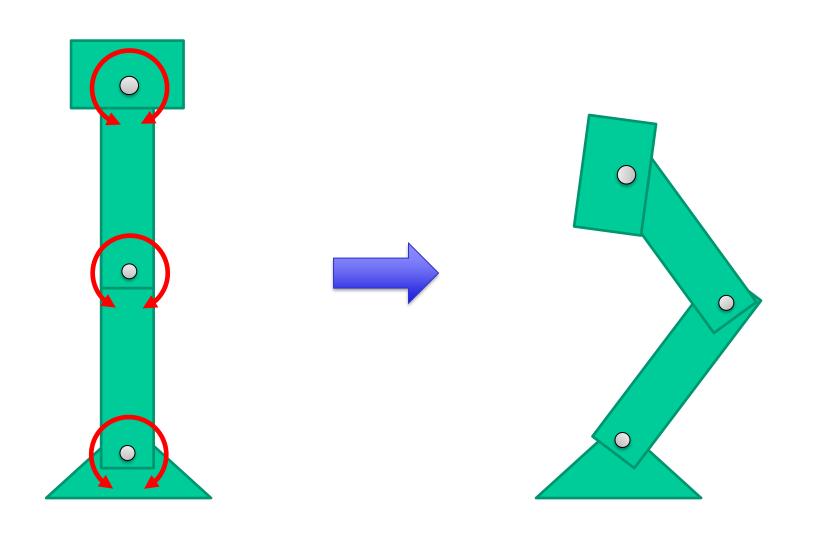
- Instances can be shared across space or time
- Write a function that renders the object in "standard" configuration
- Apply transformations to different instances
- Typical order: scaling → rotation → translation



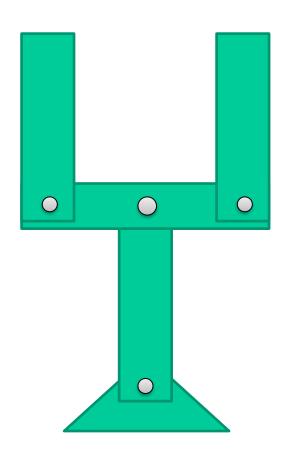
풍차 만들기



로보트 팔 만들기

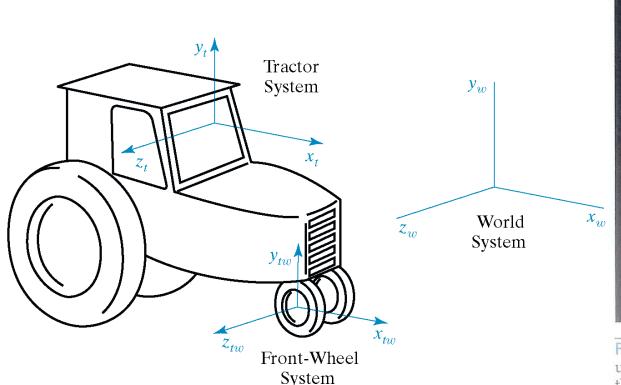


로보트 팔 만들기2



Hierarchical Modeling

 A hierarchical model is created by nesting the descriptions of subparts into one another to form a tree organization



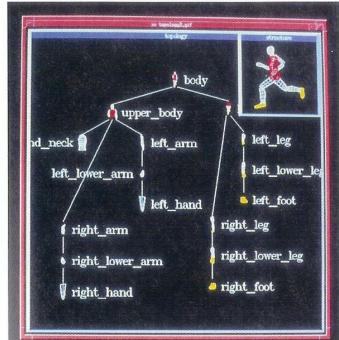


FIGURE 14–4 An object hierarchy generated using the PHIGS Toolkit package developed at the University of Manchester. The displayed object tree is itself a PHIGS structure. (Courtesy of T. L. J. Howard, J. G. Williams, and W. T. Hewitt, Department of Computer Science, University of Manchester, United Kingdom.)

OpenGL Matrix Stacks (OLD)

- Stack processing
 - The top of the stack is the "current" matrix

```
-glPushMatrix(); // Duplicate the current matrix at the top
```

```
-glPopMatrix(); // Remove the matrix at the top
```

Matrix Stacks by your own

- We emulate Matrix Stacks by using:
 - Linked List such as std::list or std::deque
 - Or a tree structure for more generality.