Model View Matrix and its implementation

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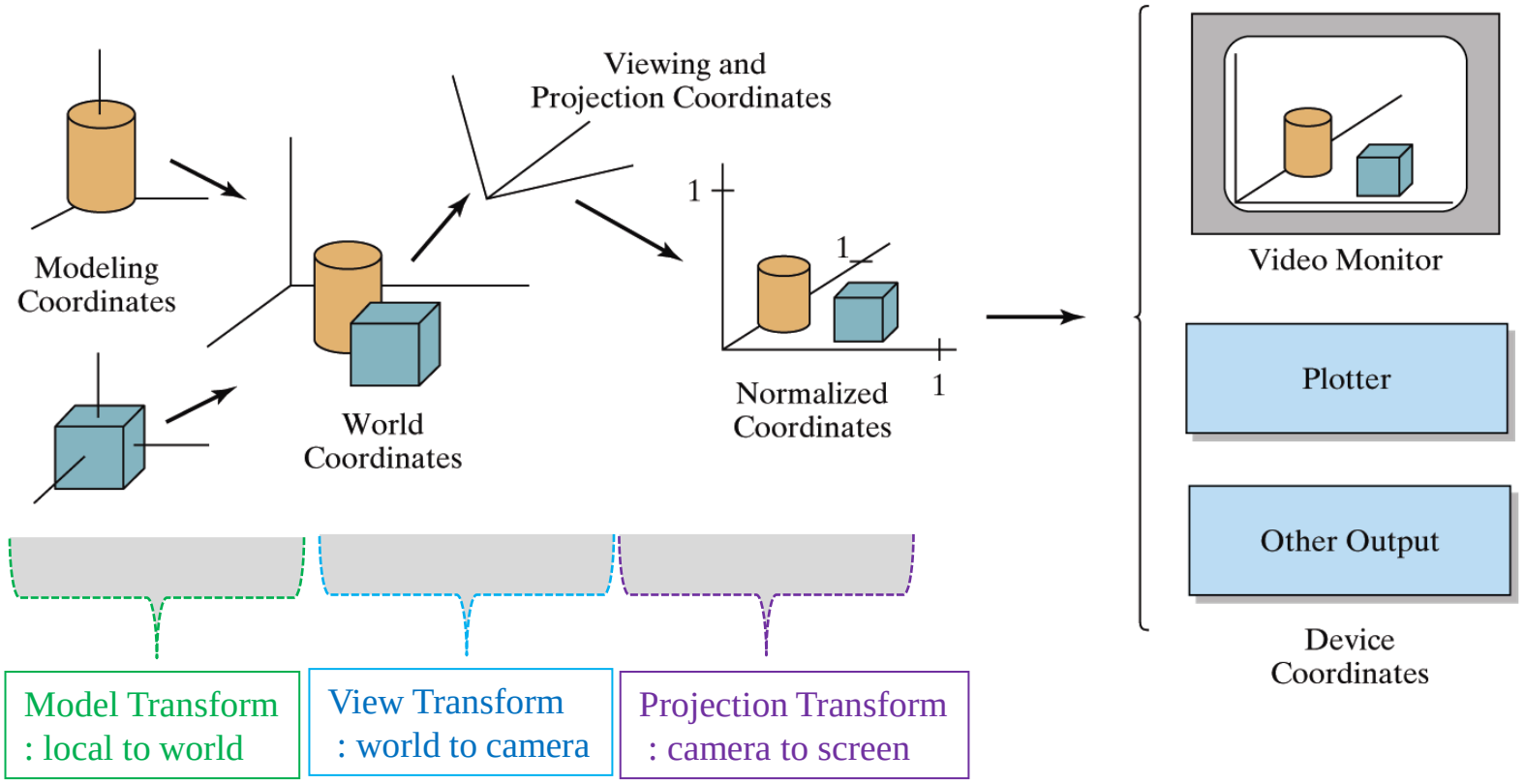
OpenGL Geometric Transformations

- **Consecutive Transformations in OpenGL Pipeline**



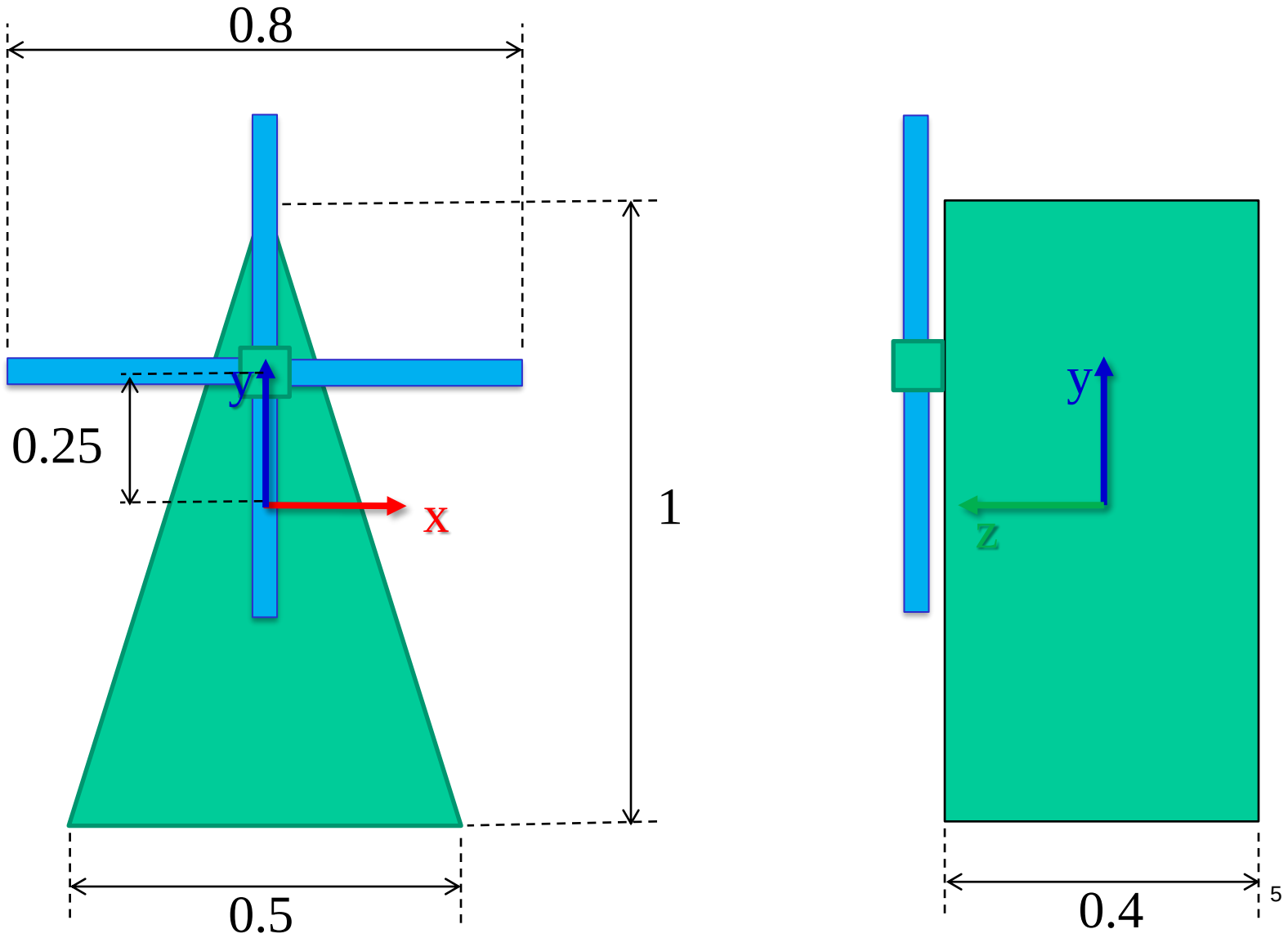
Topics

- Local to World Coordinate Transform
- Camera Positioning

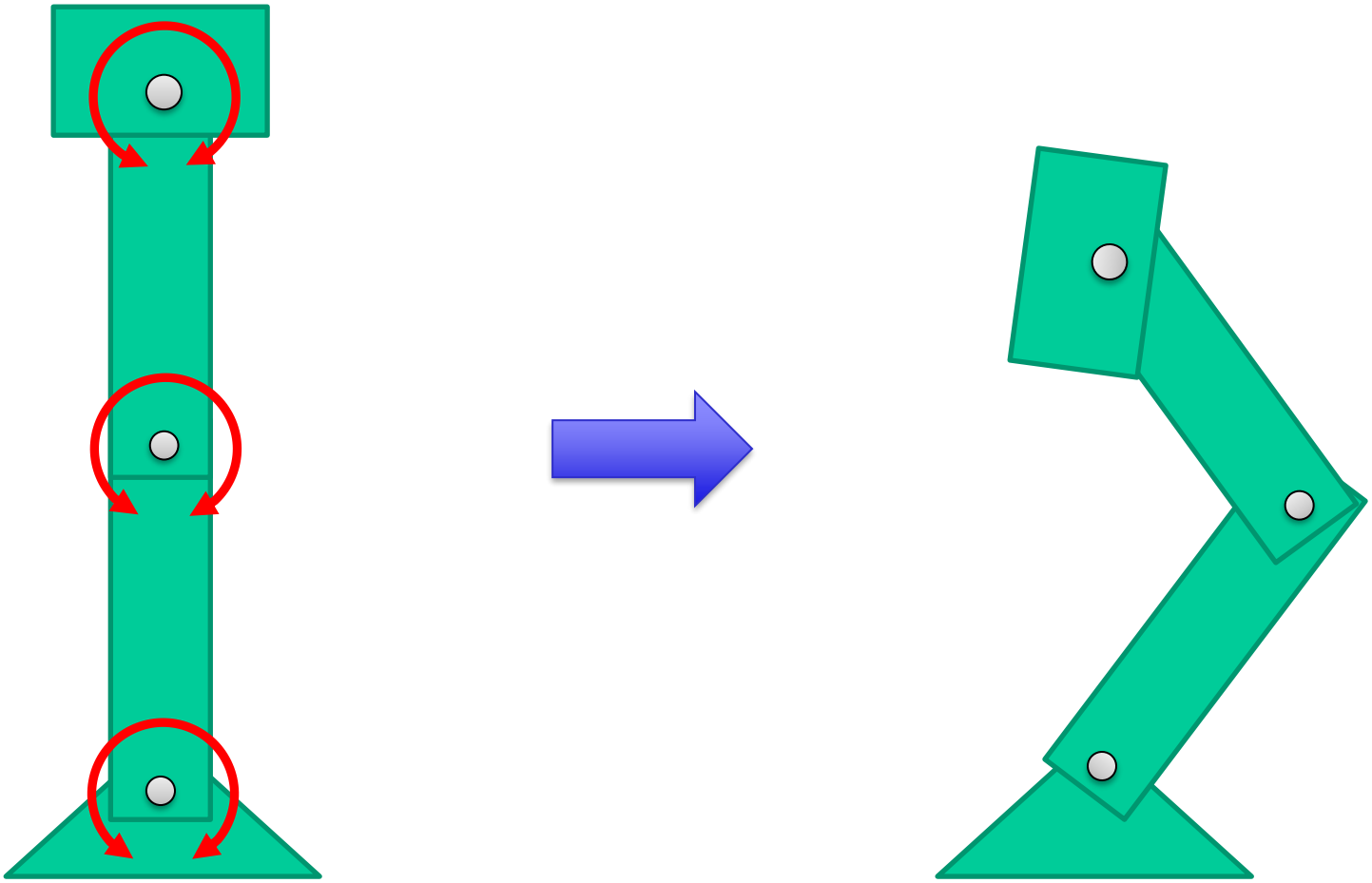
Instance Transformation

- 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*

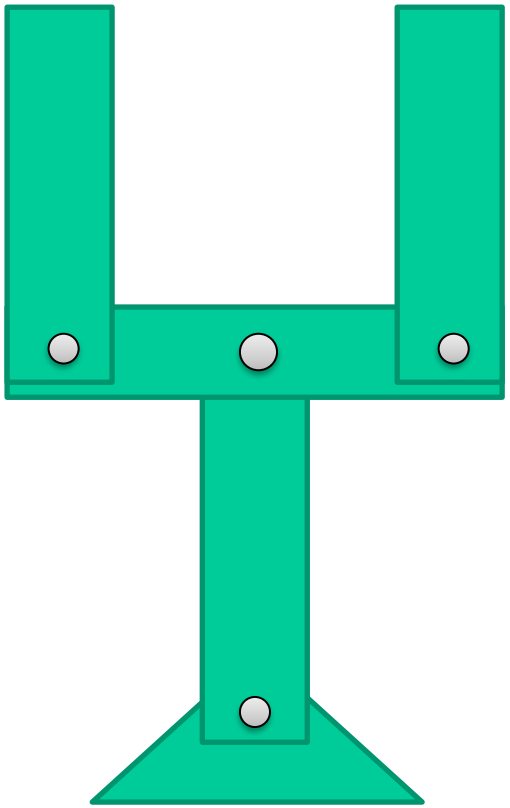
풍차 만들기



로보트 팔 만들기

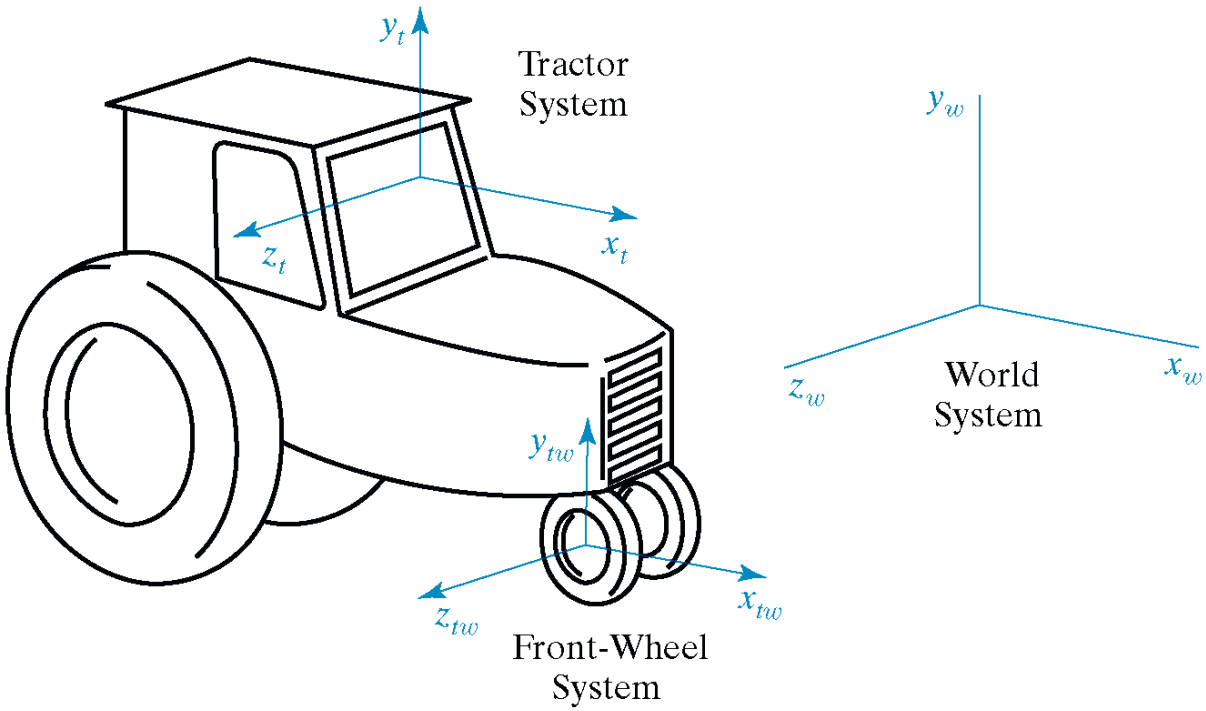


로보트 팔 만들기2



Hierarchical Modeling

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



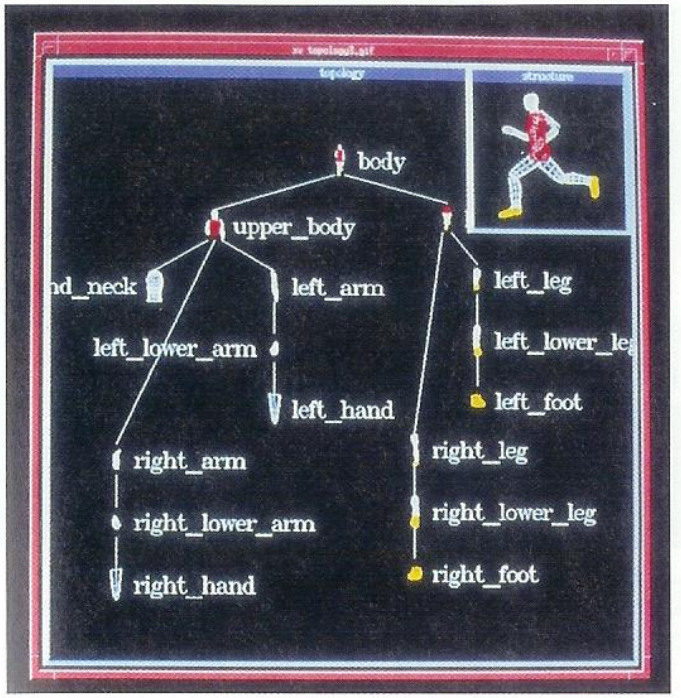


FIGURE 14-4 An object hierarchy generated using the PHIGS Toolkit package developed at the University of Manchester. The displayed object tree is itself a PHIGS structure. (*Courtesy of T. L. J. Howard, J. G. Williams, and W. T. Hewitt, Department of Computer Science, University of Manchester, United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