

CS 420

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Chapter 4 — Respect

What transformation is this?

$$\begin{bmatrix} 2 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Figures 4.1, 4.2 and Section 4.1.1 are Key!

(See accompanying figures PDF)

Consider an object frame and an auxiliary frame:

$$\vec{O}_t = \vec{W}_t O$$

$$\vec{A}_t = \vec{W}_t A$$

both defined in terms of a world frame and we want to "do M to O wrt A "

(2)

$$\vec{w}^t = \vec{a}^t A^{-1}$$

$$\vec{0}^t = \vec{w}^t O$$

$$= \vec{a}^t A^{-1} O$$

$$\Rightarrow \vec{a}^t M A^{-1} O$$

$$= \vec{w}^t A M A^{-1} O$$

\therefore to "do M to O wrt A " we set

$$O \leftarrow A M A^{-1} O$$

In Chapter 5, we see how to define A .

The "left of" rules gives us two interpretations of multiple transformations

$$\vec{f}^t \Rightarrow \vec{f}^t TR$$

1) Left to right: Local

2) Right to left: Global