CLOSED FORM AND GEOMETRIC ALGORITHMS FOR REAL TIME CONTROL OF AN AVATAR

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\[ P_1 = (V \times R_1) \times V \]
\[ P_2 = (V \times R_2) \times V \]
Human form can be:

a) specified by specifying the joint orientations, use the given limb dimensions

b) satisfy the end-effectors by possibly stretching the limbs as necessary

Given measurements of participant’s limbs

- style of the participant extracted (a and b)

- Deformation algorithms needed to allow stretching (b)

- Size of the avatar same all the time (a), or vary (b)
Remarks

- Skeleton is only an approximation of the human body

- Trackers are placed on the skin, not at the joints

- Tracking errors, and non-linearity when multiple transmitters are present
Results:

- limited number of sensors could be used

- several smaller kinematic chains are easier to handle

- variety of complex poses can be obtained

- relationship between frames of the joints could be utilized
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Animate Transform $M_i =$

\[
\begin{bmatrix}
S\text{-frame} & * & M_1 & * & \cdots & * & M_{i-2} & * & M_{i-1}
\end{bmatrix}^{-1} * D\text{-frame}
\]

* $\Rightarrow$ concatenate