

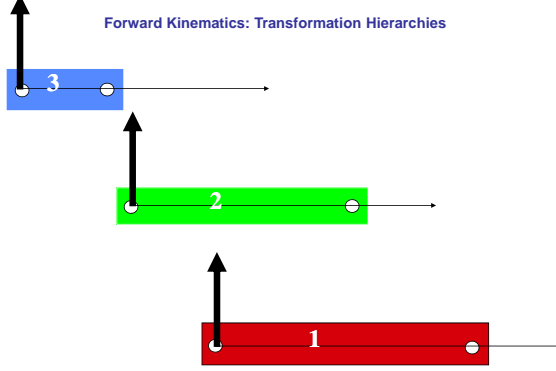
Forward Kinematics

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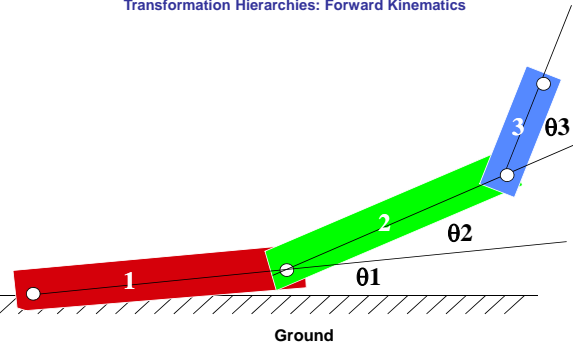
Forward Kinematics: Transformation Hierarchies



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Transformation Hierarchies: Forward Kinematics



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Positioning Part #1 With Respect to Ground

1. Rotate by θ_1
2. Translate by $\Delta_{1/G}$

Write it

$$[M_{1/G}] = [T_{1/G}] * [R_{\theta_1}]$$

Say it

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Positioning Part #2 With Respect to Ground

1. Rotate by θ_2
2. Translate the length of part 1
3. Rotate by θ_1
4. Translate by $\Delta_{1/G}$

Write it

$$[M_{2/G}] = [T_{1/G}] * [R_{\theta_1}] * [T_{2/1}] * [R_{\theta_2}]$$

$$= [M_{1/G}] * [M_{2/1}]$$

Say it

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Positioning Part #3 With Respect to Ground

1. Rotate by θ_3
2. Translate the length of part 2
3. Rotate by θ_2
4. Translate the length of part 1
5. Rotate by θ_1
6. Translate by $\Delta_{1/G}$

Write it

$$[M_{3/G}] = [T_{1/G}] * [R_{\theta_1}] * [T_{2/1}] * [R_{\theta_2}] * [T_{3/2}] * [R_{\theta_3}]$$

$$= [M_{1/G}] * [M_{2/1}] * [M_{3/2}]$$

Say it

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