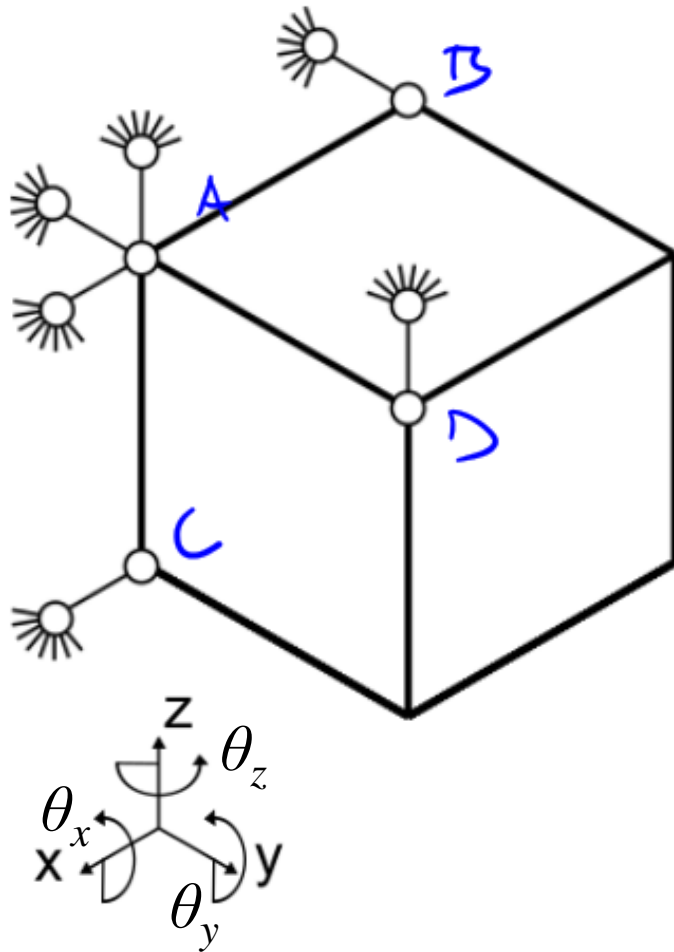


Constraints and Statical Determinacy (3D)

Example 1:



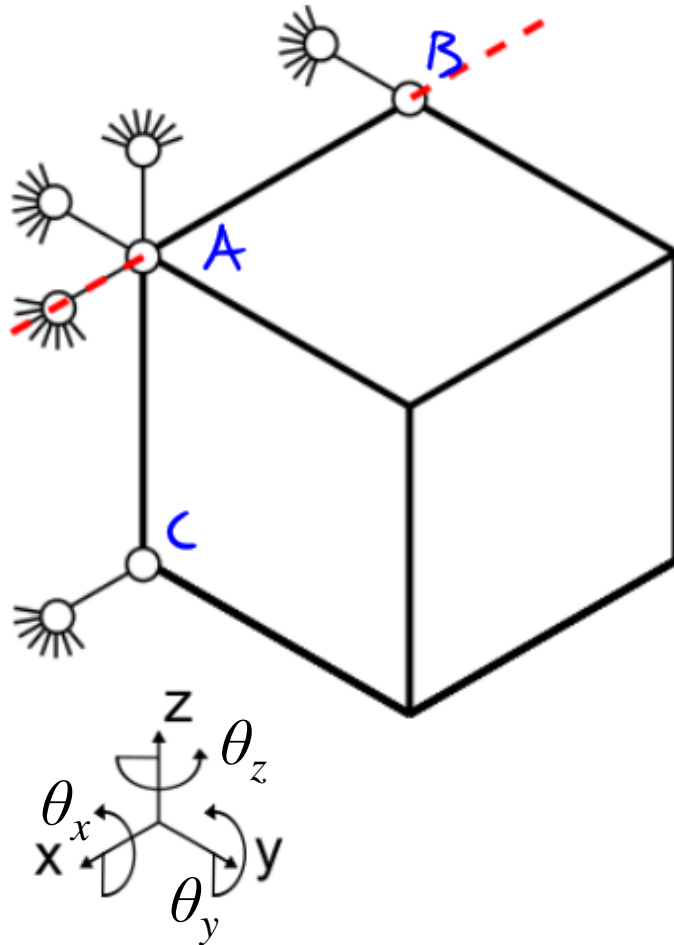
Kinematic Analysis:

- **A** blocks translations: u_x, u_y, u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotation: θ_y
- + **D** blocks rotation: θ_x

➡ **Isostatic (Statically determinate)
(Kinematically determinate)**

Constraints and Statical Determinacy (3D)

Example 2:



Kinematic Analysis:

- **A** blocks translations: u_x, u_y, u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotation: θ_y

Rotation θ_x is still allowed.

➡ **Hypostatic
Kinematically indeterminate**

Constraints and Statical Determinacy (3D)

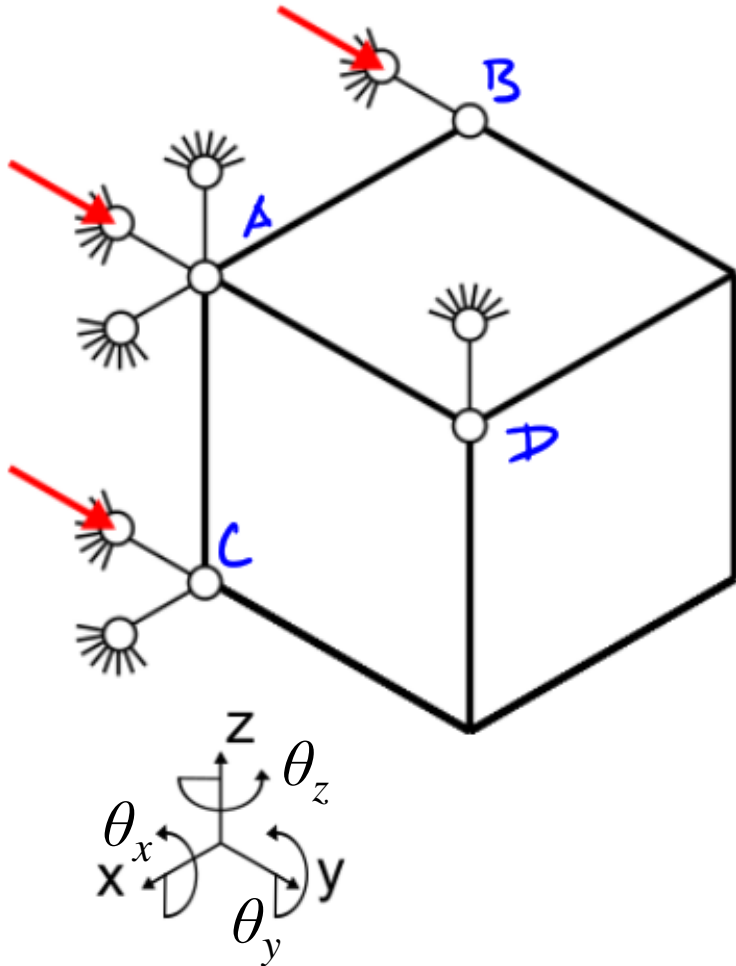
Example 3:

Kinematic Analysis:

- **A** blocks translations: u_x, u_y, u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotations: θ_x, θ_y
- + **D** blocks rotation: θ_x , (**again!**)

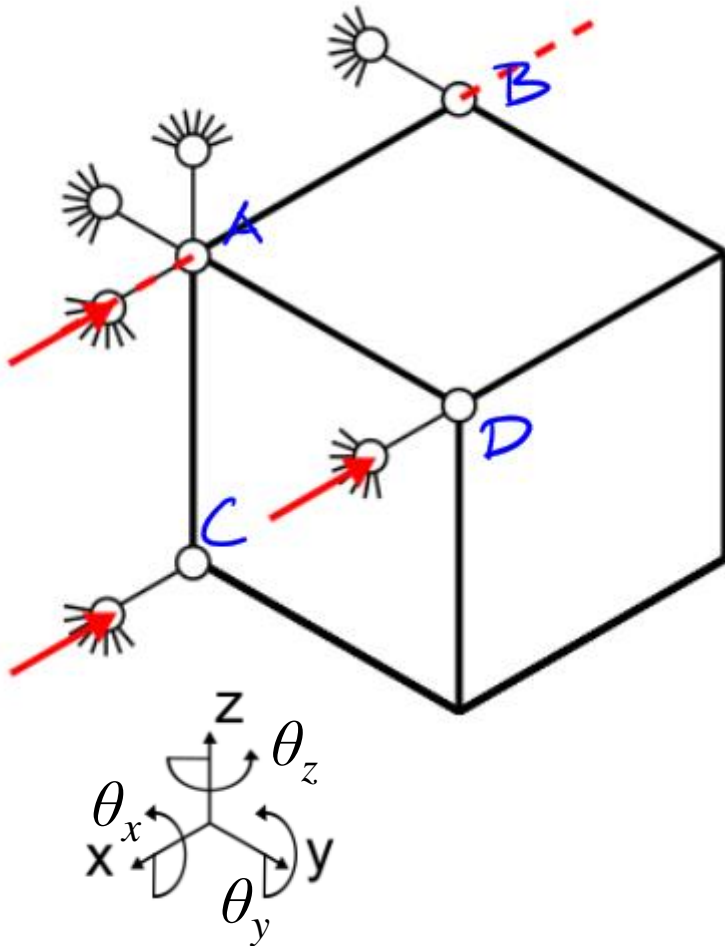
There is a redundant constraint.

➡ **Hyperstatic (statically indeterminate)
Kinematically determinate**



Constraints and Statical Determinacy (3D)

Example 4:



Kinematic Analysis:

- **A** blocks translations: u_x, u_y, u_z
- + **B** blocks rotation: θ_z
- + **C** blocks rotations: θ_y
- + **D** blocks rotation: θ_z , (**again!**)

There is a redundant constraint in θ_z .

There is a degree of freedom θ_x

➡ **Statically & kinematically indeterminate**
Hyper-and-Hypostatic