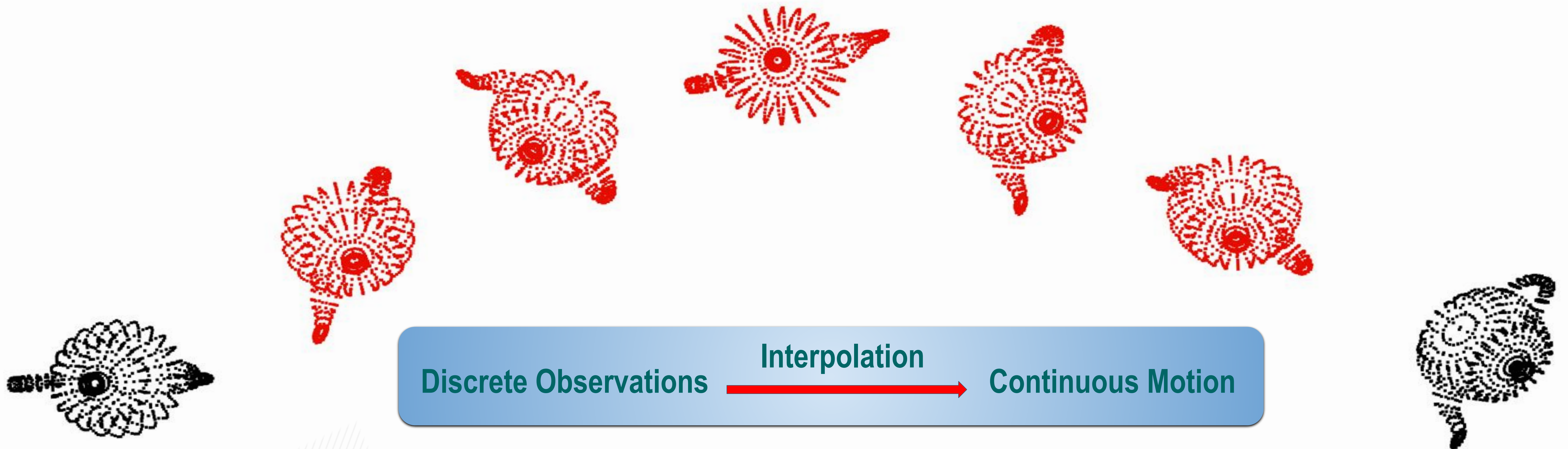


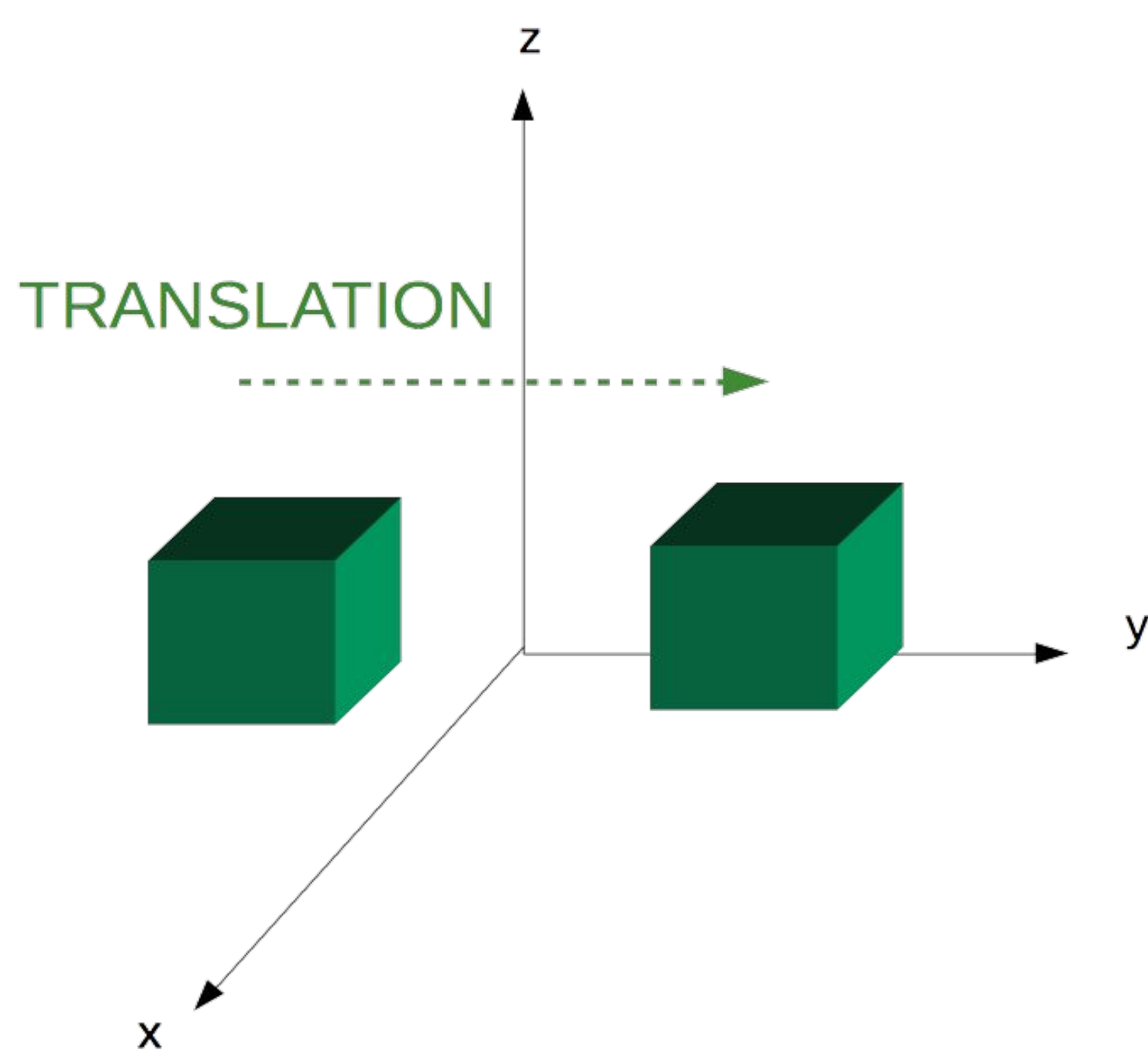
Motion Interpolation



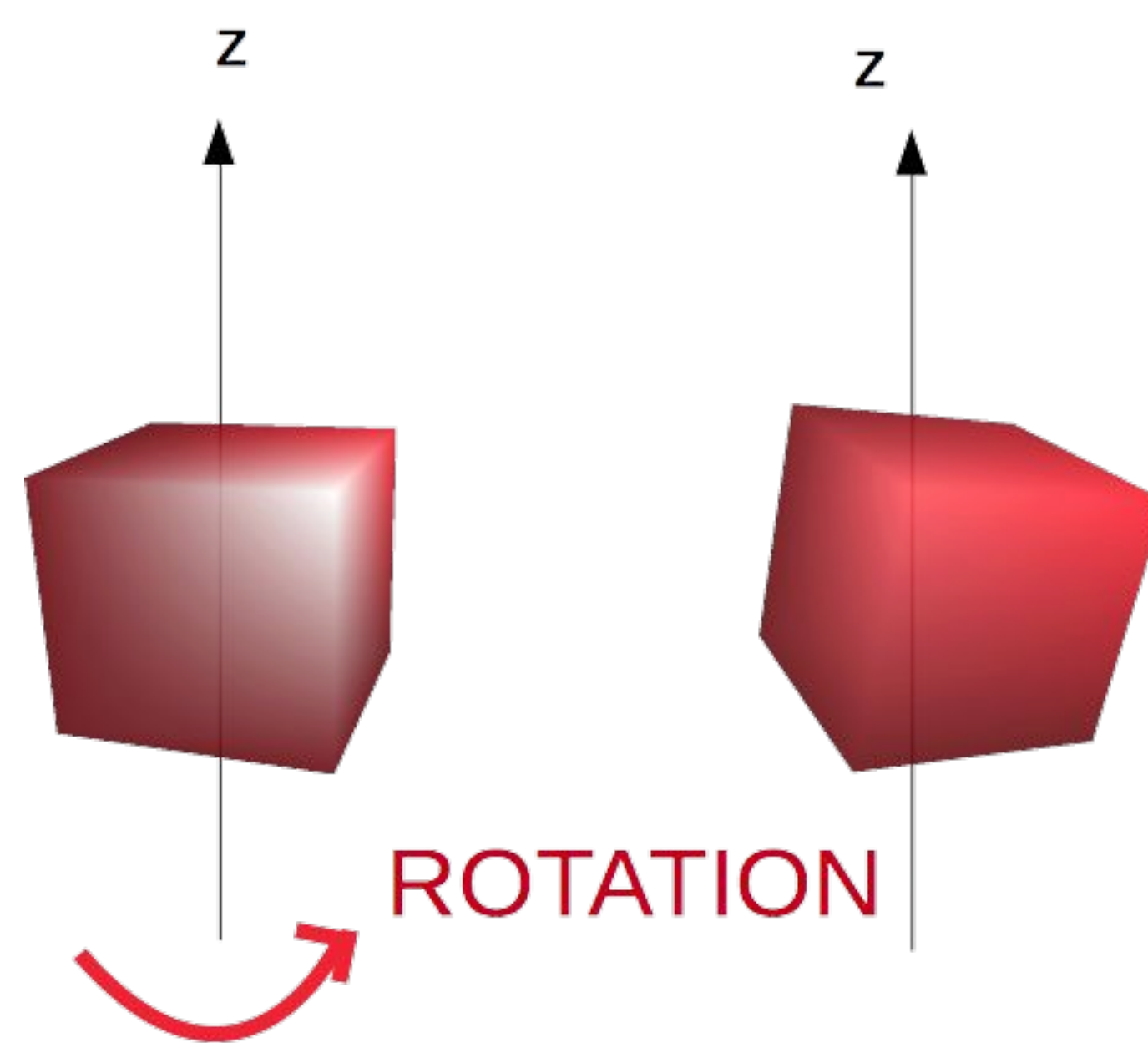
Motion Interpolation is a smooth estimation of the rotation and position of an object **between** known measurements.

Measurement devices such as cameras can only capture information at **discrete** intervals. Motion interpolation allows us to estimate the missing information.

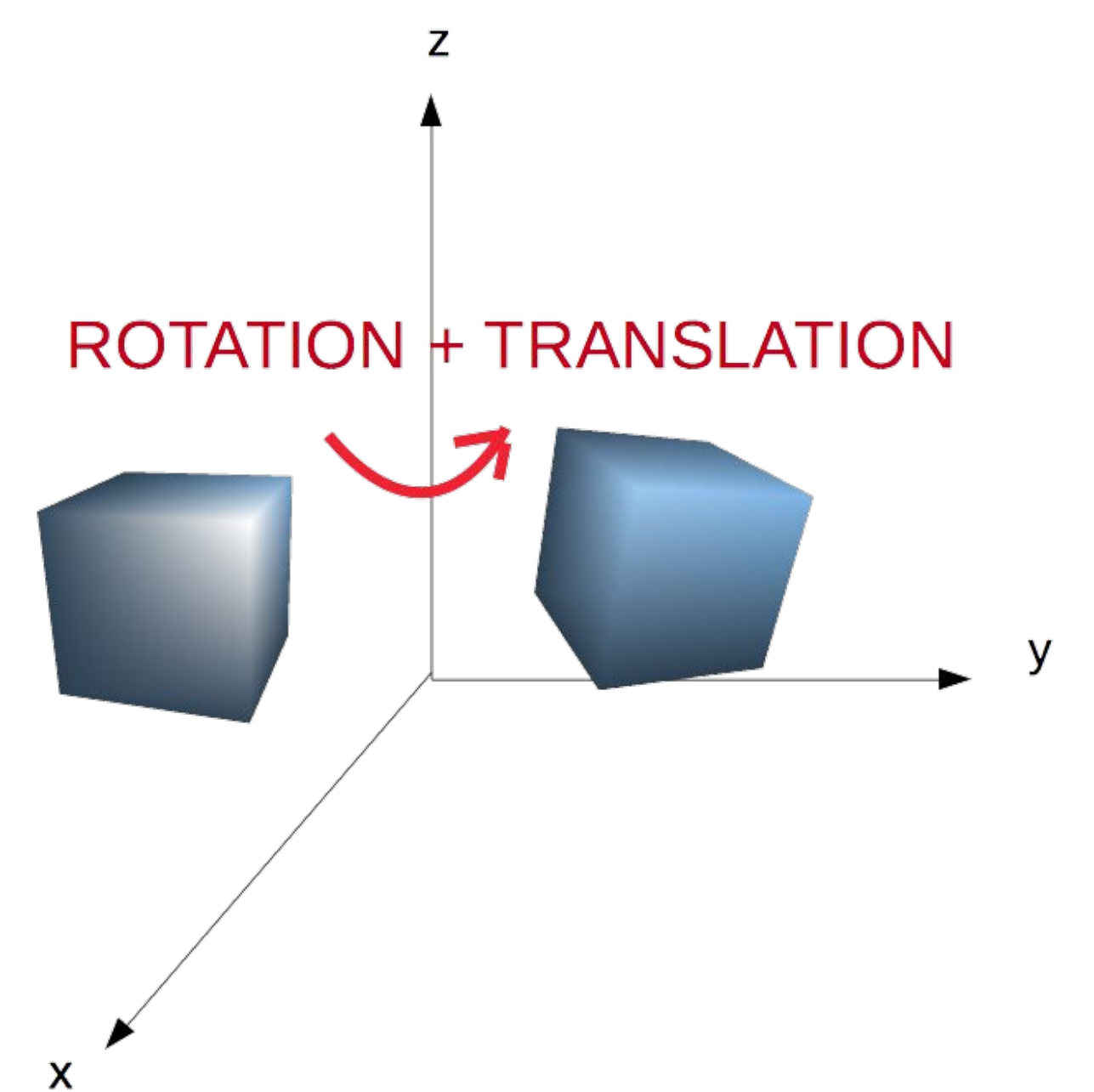
Describing Motion in 3D



Translating an object horizontally along the y-axis.



Rotating an object around the z-axis.



Skew Motion – Simultaneous rotation and translation.

Measuring Position and Rotation

- ❑ **Inertial Measurement Unit (IMU):** accelerometers and gyroscopes are used to determine the angular acceleration and velocity of an object.
- ❑ **Combining** data from **cameras** and **IMUs** allows us to make accurate predictions of the position and orientation of an object.

Cameras

- ✓ Accurate for translations.
- ✗ Not accurate for rotations.

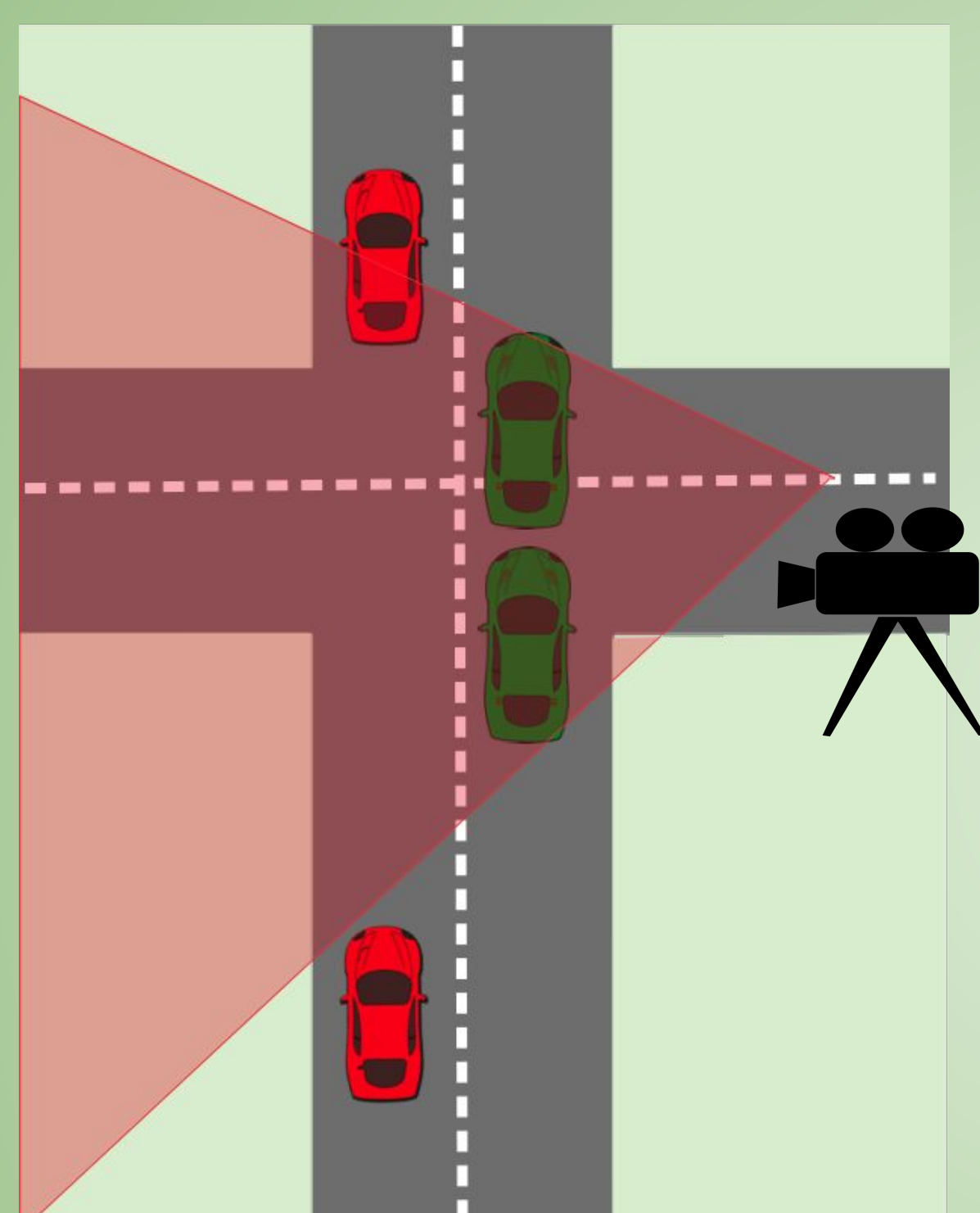


IMUs

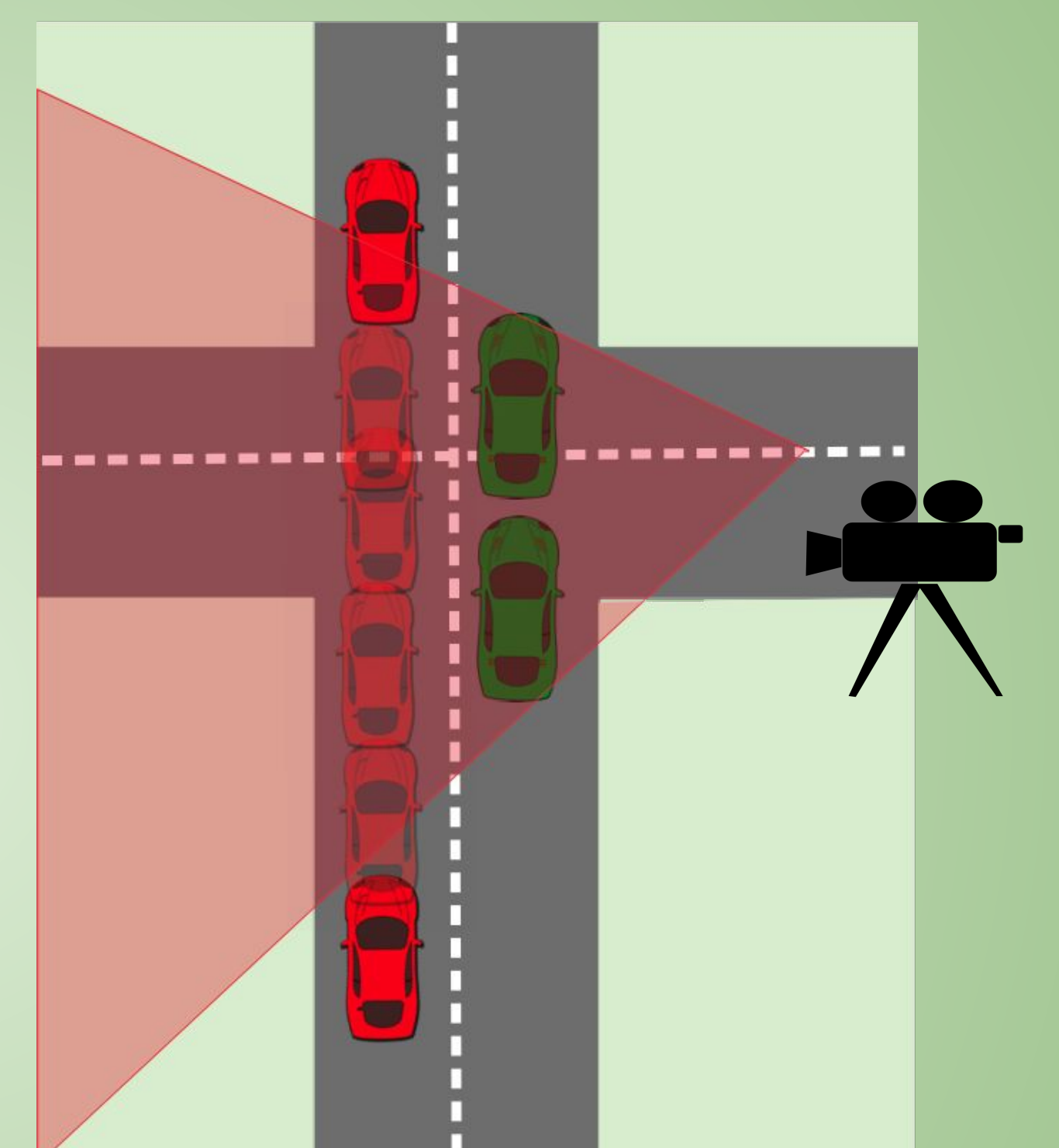
- ✓ Accurate for rotations.
- ✗ Not accurate for translations.



Tracking a Hidden Object



A Potential Application: Tracking the view of a red car that is obstructed by other objects.



Motion Interpolation allows estimation of the red car's trajectory during the time it is obscured from view.