Other wheeled systems

Finding the ICC

Multiple wheels

If the robot has multiple wheels, how does the robot move?

Two assumptions:

- Each wheel rolls forward or backward. No lateral movement.
- Wheels don't move relative to each other. The robot body is rigid.

Instantaneous center of curvature

To satisfy both of these constraints, there must be a single point, called the

instantaneous center of curvature (ICC)

around which each wheel moves in a circular motion.

Key idea

Each wheel rotates around the ICC with the **same angular velocity**.

Finding the ICC

- Draw lines **perpendicular** the rolling direction of each wheel.
- Identify points where these lines intersect.

Four cases

- If the lines intersect at a single point, that point is the ICC.
- If the lines overlap, the ICC can lie anywhere along that line.
- If the lines are distinct and parallel, the ICC is 'at infinity' in that direction.
- If the lines do not share any common intersection point, the robot cannot move.