

Drive Trains

The Bionic Tigers - 10464



Considerations when choosing

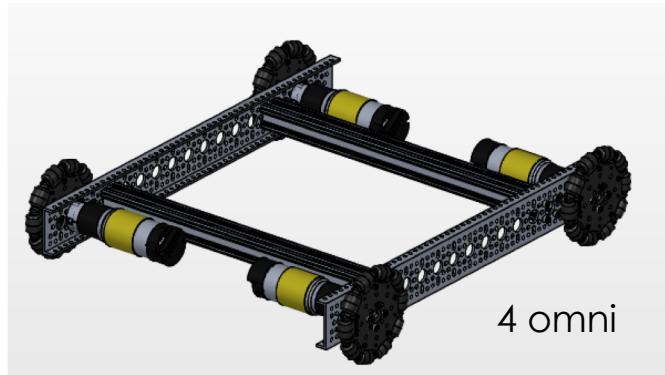
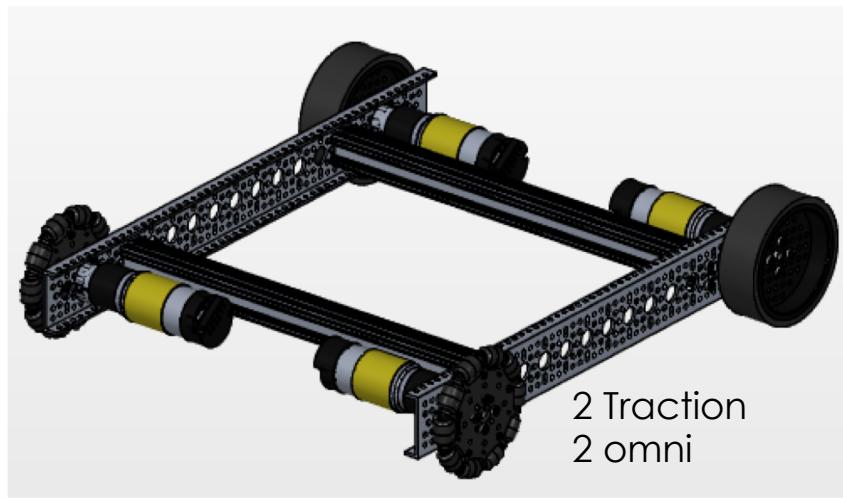
- Speed
 - How fast do you want to go?
- Power
- Maneuverability
- Traction
- Terrain
- Omni-directional

Drivetrain Types

- 4 Wheel
- 6 Wheel
- Mecanum
- X-Drive
- H-Drive
- Treads
- Swerve Drive

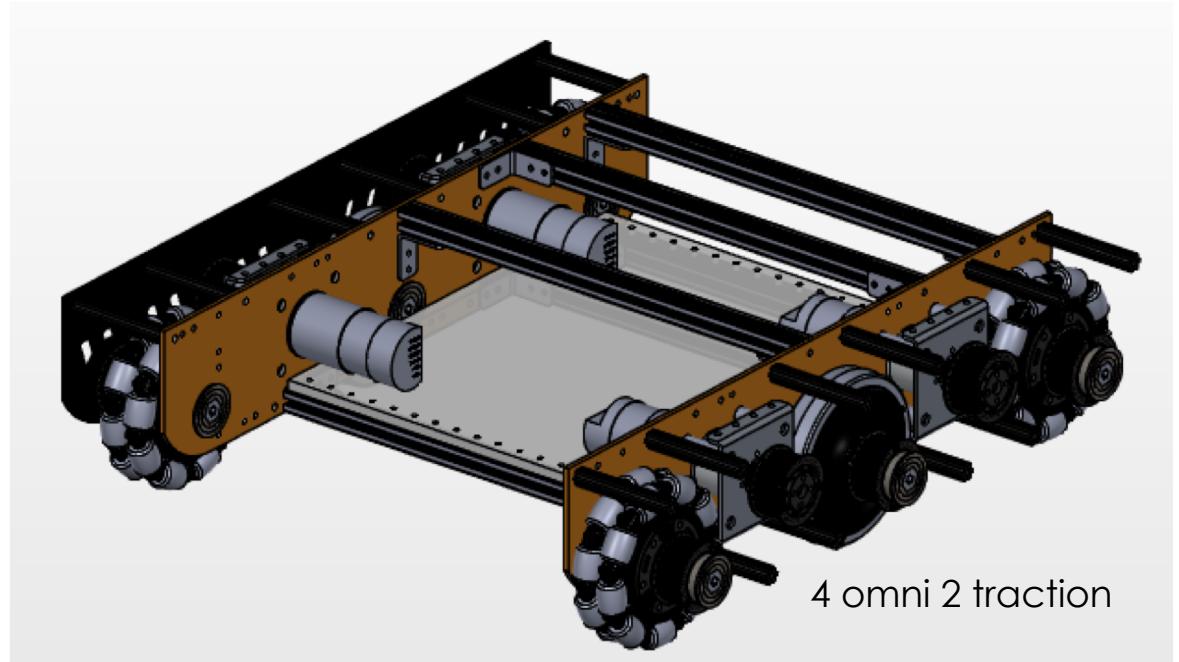
4 Wheel

- 4 Traction Wheels
 - Good Traction
 - Poor Maneuverability
- 2 Traction 2 Omni
 - Off-Center Rotation
 - Good traction
 - Good Maneuverability
- 4 Omni Wheels
 - Good Maneuverability
 - Poor Traction



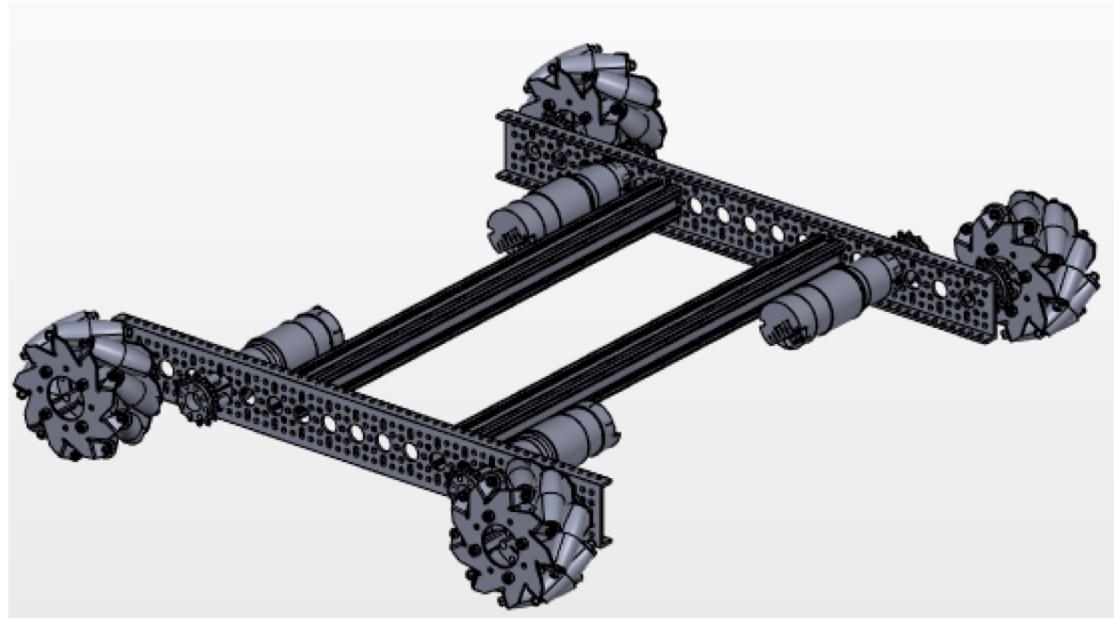
6 Wheel

- High Traction
- Good Maneuverability
- Versatile Terrain
- Can't strafe



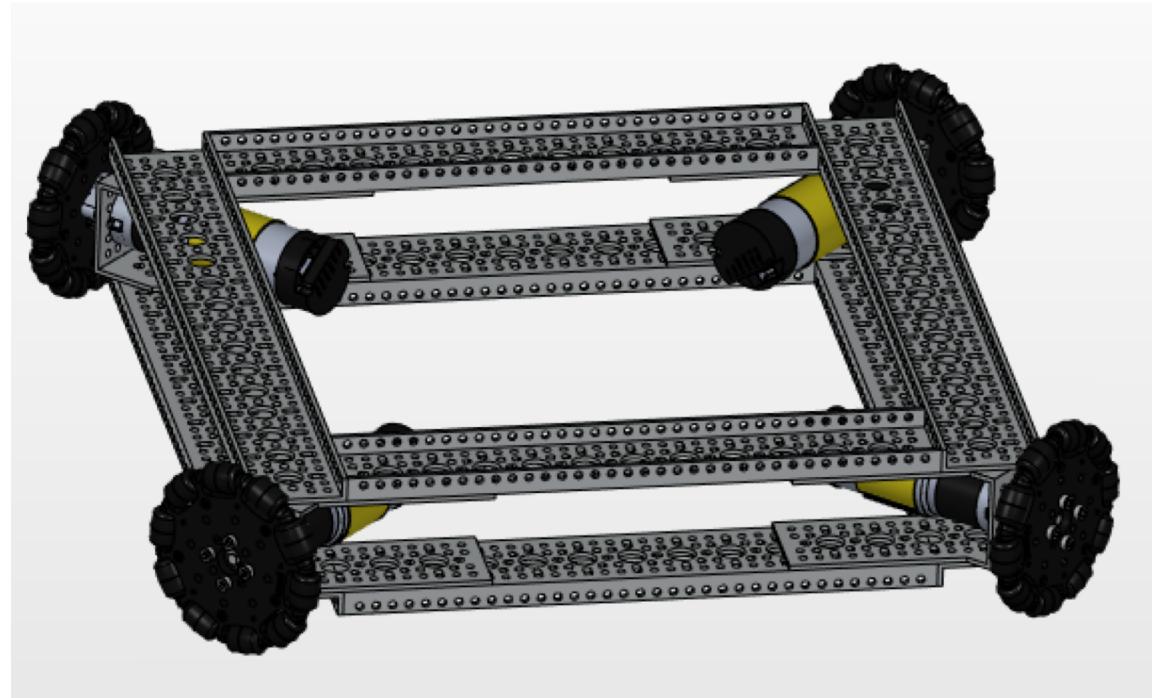
Mecanum

- High Maneuverability
- Good Traction
- Strafing
- Best on flat field
- Requires exact measurements for best application



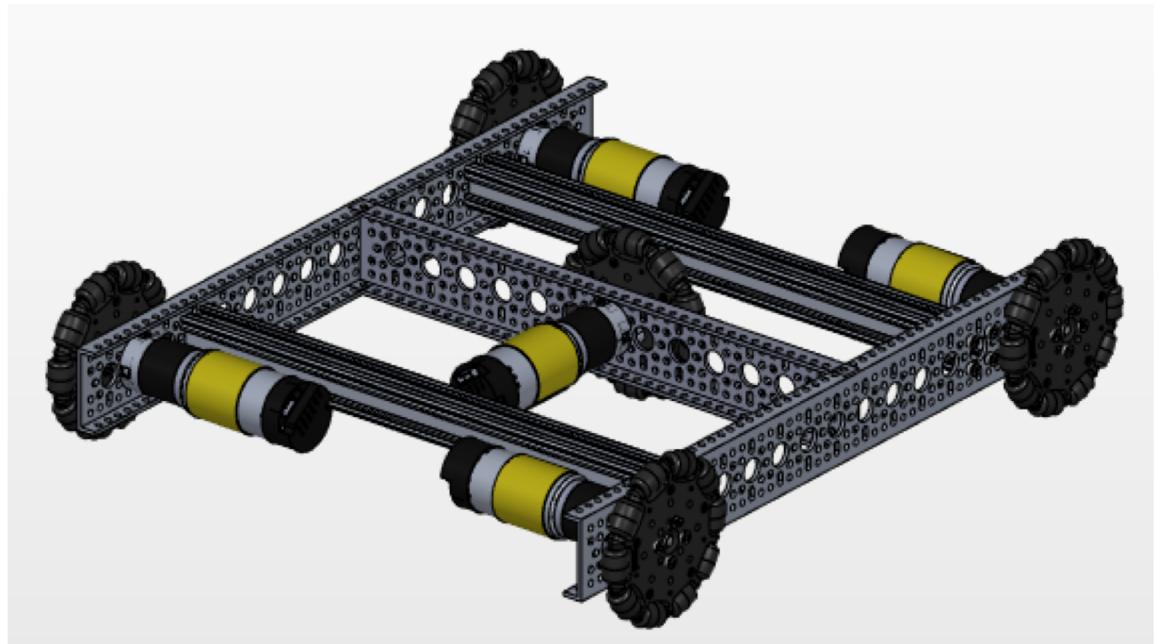
X-Drive

- High Maneuverability
- Poor Traction
- Strafing
- Unorthodox Motor Placement
- Static Buildup



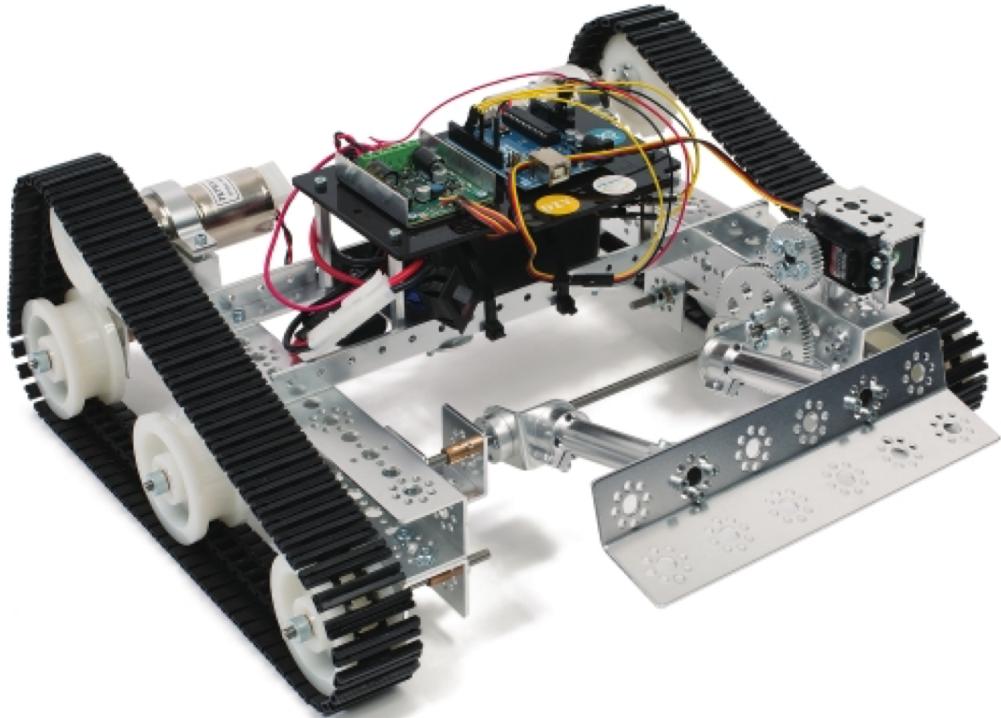
H-Drive

- High maneuverability
- Strafing
- Poor traction
- Space and motor consuming
- Static Buildup



Treads

- Good traction
- Versatile Terrain
- Poor maneuverability
- Prone to breaking



Swerve

- High maneuverability
- Good traction
- Complex programming
- Space consuming
- Complex design



Drive Methods

How to get from motor to wheel

Direct Drive

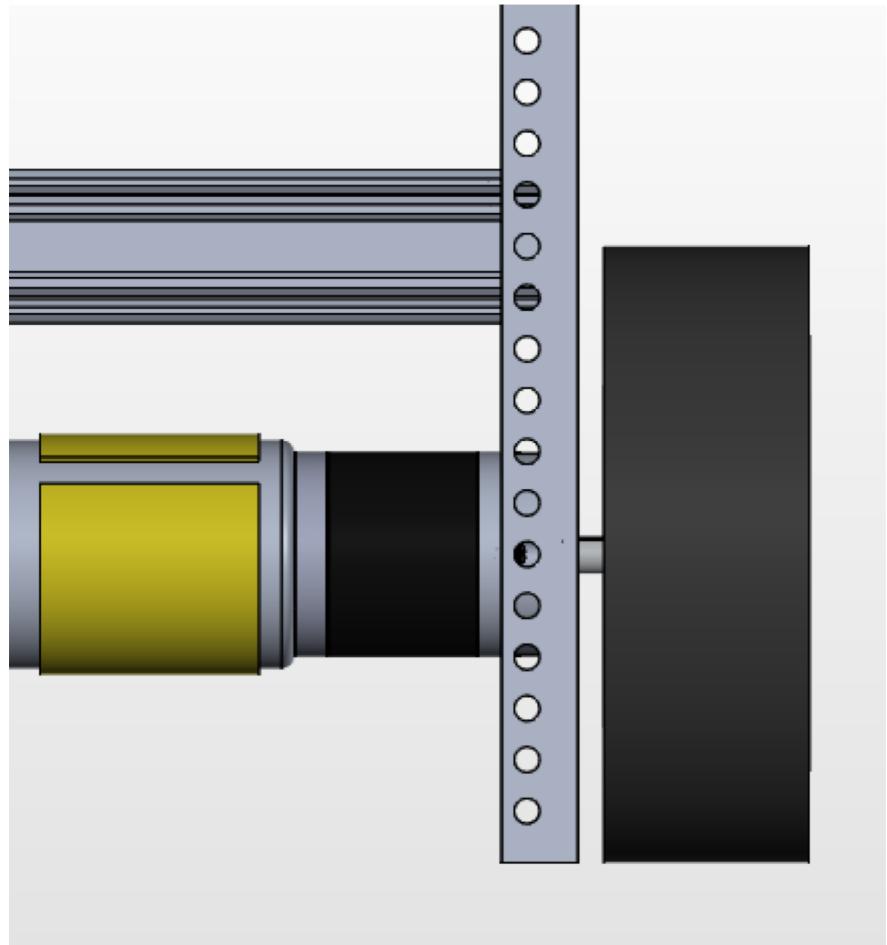
Chain Drive

Belt Drive

Gear Drive

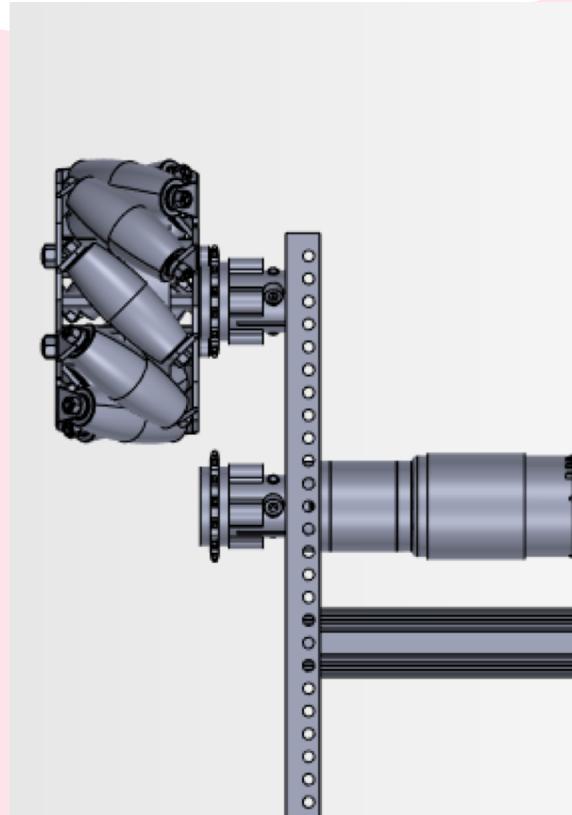
Direct Drive

- Motor and wheel share the same shaft
- Fewer points of failure
- No flexibility in motor position
- Wears down motor gearbox



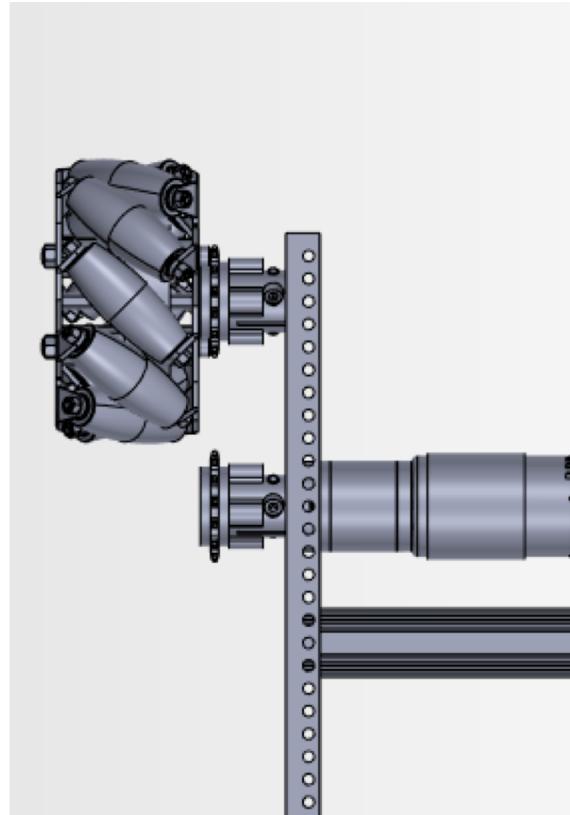
Chain Drive

- Flexible motor positioning
- Variable gear ratio
- Adjustable length
- Requires tension
- Multiple points of failure



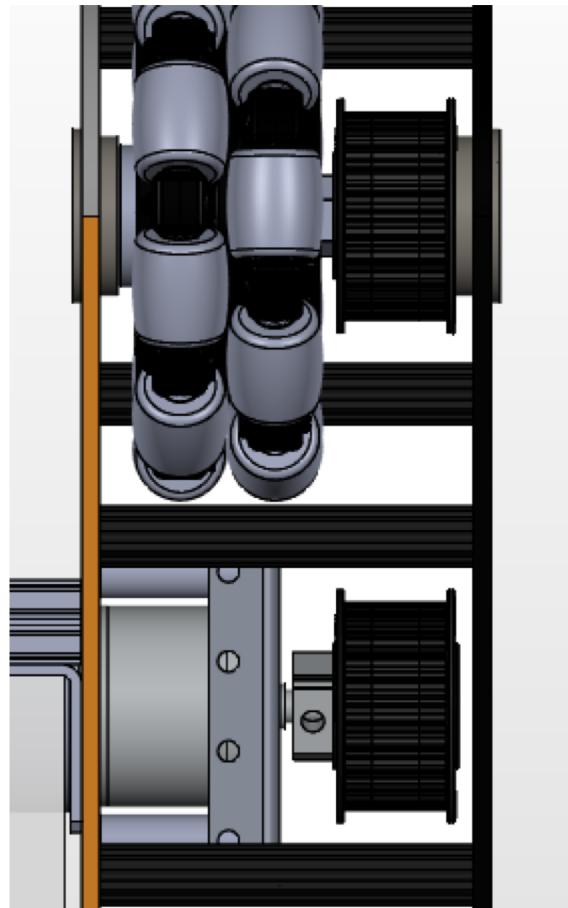
Chain Drive

- Flexible motor positioning
- Variable gear ratio
- Adjustable length
- Requires tension
- Multiple points of failure



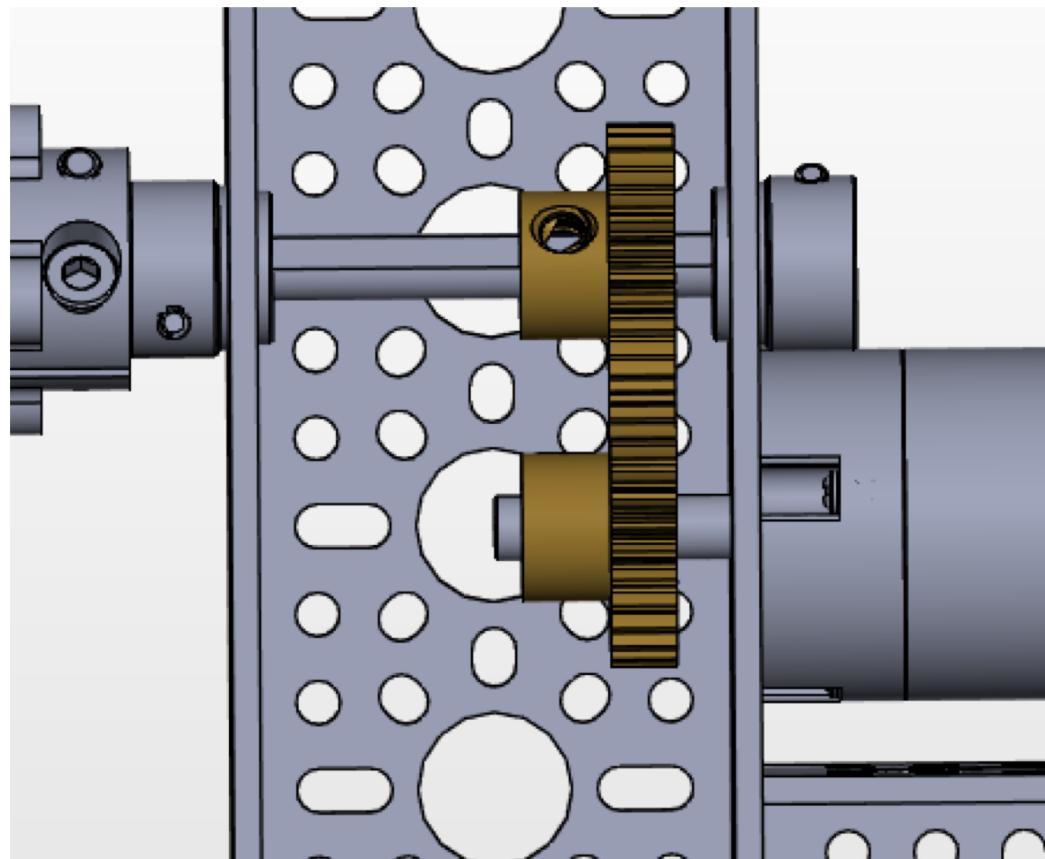
Belt Drive

- Flexible motor position
- Low maintenance
- Variable gear ratio
- Relatively few points of failure
- Requires precise positioning
- Requires tension



Gear Drive

- Semi-flexible motor position
- Variable gear ratio
- Can slip and grind
- Multiple points of failure

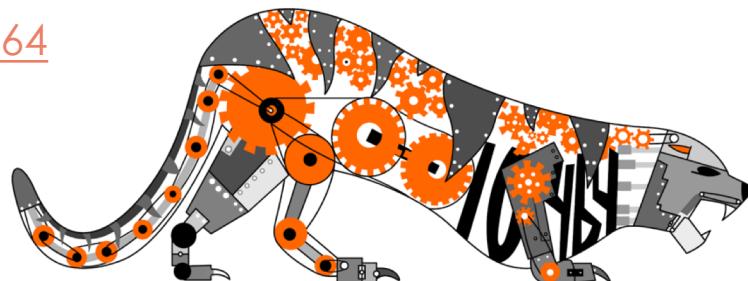


Tips and Tricks

- Advice based on our own learnings
- Take advantage of D shaped and hex shafts
- Use consistent structure such as channel pieces
- CAD and prototype before making complicated assemblies
- Plan your drivetrain to accommodate the other mechanisms on your robot

Credits

- This lesson was written by The Bionic Tigers 10464 for FTCTutorials.com
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