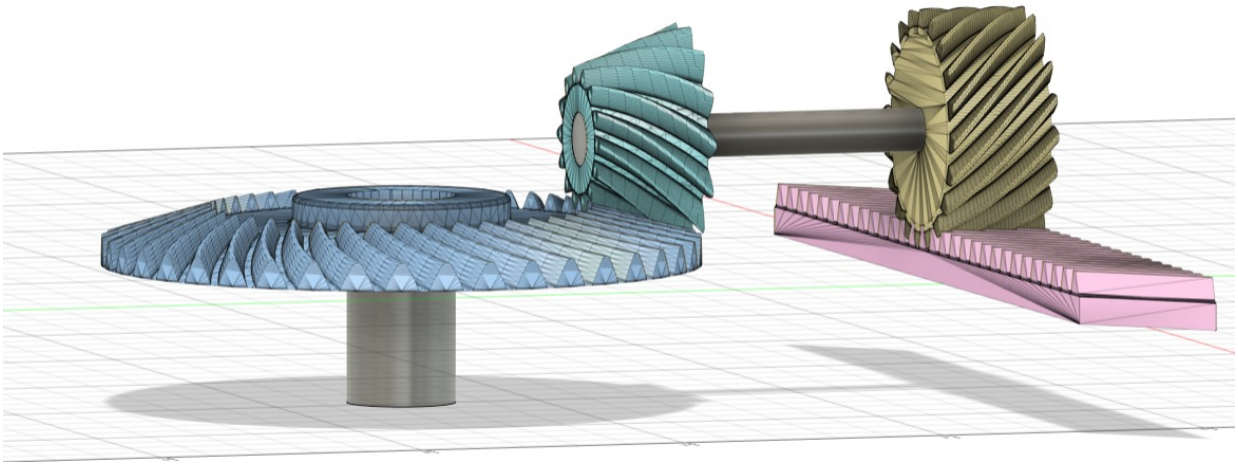
W4-A1

Created	@December 20, 2024 1:53 PM
Class	RoboDive

Fusion 360 diagram of the gear train

- consists of a hypoid gear with a helical gear in contact with a helical gear rack



Efficiency calculation

Hypoid Gear - (80-95)%
Helical Gear - (94-98)%
Helical gear rack efficiency - (90-99.5)%

Overall efficiency - (72-95)%

Comparison Table

Motor Type	Torque	**Speed**	Control Complexity
DC Motor	High torque; suitable for applications requiring continuous rotation.	High speed; speed varies with applied voltage	Simple control; speed controlled by varying voltage, direction by reversing polarity.
Stepper Motor	High torque at low speeds; excellent for precise positioning.	Low to moderate speed; speed decreases with increasing load.	Moderate complexity; requires driver circuits and precise pulse control for accurate positioning.
Servo Motor	Moderate torque; designed for precise angular positioning.	Moderate speed; speed varies with control signal.	High complexity; incorporates feedback systems for precise control.