

Gripper Type Selection

Gripper types

1) Parallel jaw



2) 3 fingers



3) Adaptive



Note: Other gripper types such as magnetic and suction-based grippers were considered but excluded from the comparison for the following reasons:

- **Magnetic grippers** are not suitable because the cubes are made of plastic and contain no ferromagnetic materials.
- **Suction cup grippers** require an external air supply (e.g., compressor or vacuum pump), which would add significant weight, complexity, and



power consumption to the mobile robot, making them impractical for this application.



Comparison

Criteria	Definition	Weight	Parallel jaw	3 fingers	Adaptive
Simplicity	Number of moving parts	15%	14	11	7
Ease of design	Estimated design time (hrs)	10%	10	6	4
Ease of manufacturing	3D printable?	15%	13	12	11
Stability	Contact points	20%	12	15	18
Weight	Mass (grams)	25%	22	20	13
Coat		15%	15	13	10
Total	-	100%	86	77	63