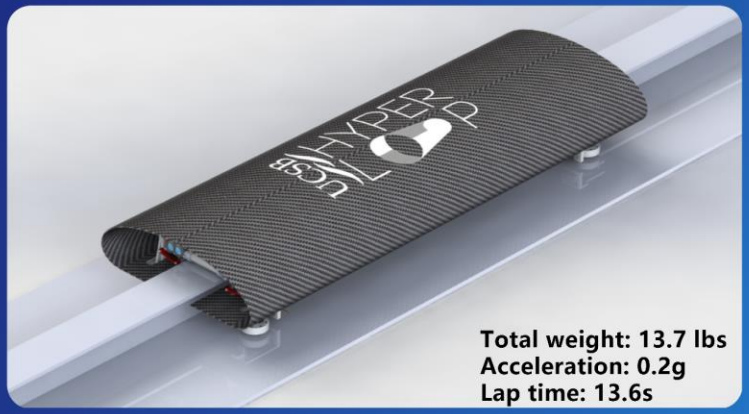
UCSB HYPERLOOP

Weightless. Wait less.



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OVERVIEW

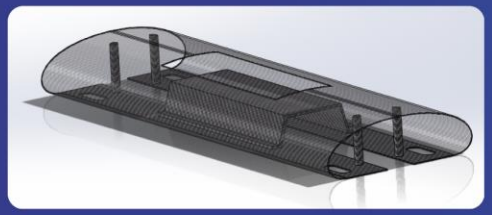
In 2013, Elon Musk proposed a futuristic transportation system: the Hyperloop, a high-speed levitating pod propelled through a low pressure vacuum tube to minimize air drag and friction.

To bring the Hyperloop concept to life, SpaceX hosts a head-to-head competition where teams from all over the world come to compete with their own Hyperloop pod designs.

This year, the team is competing in the Levitation Competition, in which the pod must levitate and translate in a there-and-back lap down a 150 ft I-beam track. The fastest pod wins!

THE SHELL

- Stiff and lightweight carbon fiber serves as combined structural frame and aerodynamic shell
- Honeycomb core offers higher strength-to-weight ratio than carbon laminates alone



ELECTRONIC CONTROLS UNDER THE SHELL

LIDAR
Uses laser to detect nearby wall and engage emergency

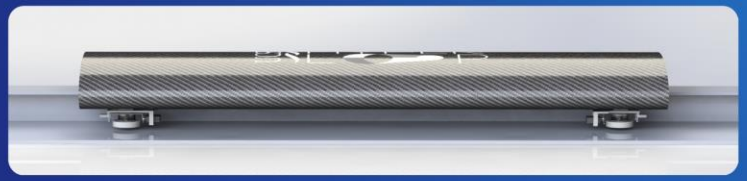
PCB
Primary control unit and sensor monitoring system

BMS
Monitors battery & protects from over-current and over-discharge

IMU
Gives acceleration and rotation of pod in all 3 axes

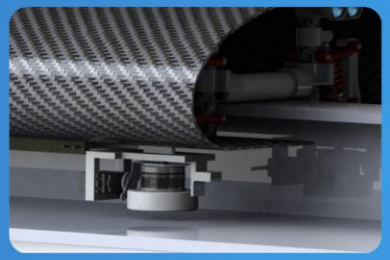
Battery
Lithium-Polymer

GPS
Gives position of pod along I-beam in real time



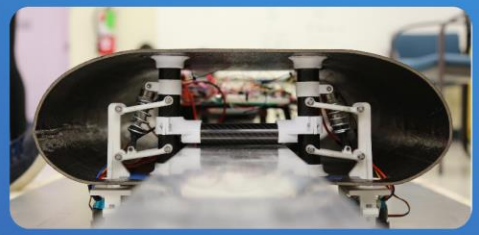
MAGNETIC LEVITATION

- Four custom maglev hover engines generate lift and propulsion
- Servos control the tilt angle of the maglev engines for precise control of forward and reverse acceleration



STABILITY

- Double wishbone vertical suspension stabilizes height, pitch, and roll
- Leaf spring suspension stabilizes yaw and lateral movement
- Failsafe brake skids safely bring the pod to a stop in the case of failure



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