Locomotion Team

Purpose

The locomotion team is responsible for designing the way rover moves, as well as taking consideration of the compatibility with other teams. The basic requirement would be to enable the rover to move freely on flat floor. More advanced objectives include all-terrain and step-climbing (Both? Yes please!).

Design Ideas

- The locomotion part is the part that the rover contacts with the ground, so it should be **strong enough** to support the weight of the rover and also the force applied by rover's movement.
- The locomotion part should be **efficient** on the design level. For example, the track design on the flat floor is not as efficient as a steered wheel solution because it brings horizontal drag as it turns (although tracks are cool and work well on uneven surface and even sometimes steps)
- Being **simple and intuitive** is better than being unnecessarily complex, as long as they provide the same level of functionality.
- It would be better if the design could be constructed **progressively**. For example, we can first implement only the most basic part of our design, and then complete it as we go further and further while we have more and more experience. (for example, for the rocker-bogie design, we can first implement only the front wheels and rear wheels, while leaving the center wheels and all-terrain mechanism unimplemented.

Structures

There are many ways to complement the mobility part of the rover. The most practical ways for our project include wheel-setting and track-setting, but other challenging configurations are also welcomed.

- wheel configurations
  - two motored wheels with a caster wheel in the front
  - a rocker-bogie design
  - a mass-shifting four main wheels (for movement on the flat floor) with two smaller wheels in the back (for supporting when climbing the steps), while a controller on the top control the center of mass
  - a triple-wheel design enabling the climbing of steps
  - other designs
- track configurations
  - tank track
  - common robot track

- two-segment track (enabling step climbing)