Risk

Software

a. Potentially using a camera to determine the relative position of the car on a wall. Could involve with using IOS AR software to calculate distance. However, the process could be complicated to make it accurate. Image recognition and AR distance measurement may not be precise.
b. The latency due to information transaction between the car and the controlling device could lead to unsatisfactory accuracy of route controlling.

Hardware

c. The toy car may not be easily modified to suit the project requirements. In order to draw on the wall, the car needs to carry a pen. However, using a pen could be problematic since the pen only sticks out when the car is drawing and needs to be contained when the car is not drawing. If the pen sticks out too much, it could damage the wall and lift the car from the surface, potentially causes the car to fall off the wall.
d. The toy car may not meet the accuracy instruction given by user. This is related to the quality of the toy car, which may not have the ability to move along with the accurate instruction path (straight lines and curves). Even if the toy car is able to do that, it is not guaranteed that the car will maintain its movement accuracy after we modify the car. Since we have to make a new attachment (probably pen) on the car to implement its drawing functionality, weight, structure, and center of gravity would change.

Backup

A. Potentially creating a "beacon" that attaches on the wall and synchronously communicates with the car to get the relative location of the car.
    - Limitation: additional work to build and test the beacon system. Could be time consuming and having a limited effective distance for proper beacon-car connection.
B. Not having a backup for this problem at the moment.
C. Since we may not be able to attach a physical pen due to its stretching out and drawing back nature, we could use spray-paint instead, which it could be attached in a fixed location.
    - Limitation: however, because spray-paint takes advantage of air pressure to paint, the volume or mass the car needs to carry may be much larger than a pen.
D. If the accuracy of an existing toy car doesn't meet our requirements, we do have a plan to construct a car by ourselves. It could be designed as a 4-wheeled cross-shaped framework

supporting a pen/painter and stronger propellers. We can then use arduino to control its movement and receive data from the car in a customized way.

- Limitation: designing a car that moves on a wall consistently without falling or slipping down could be difficult.