# Smart City 4 – No Signal
# Automatic Paint Spraying Machine

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## Project introduction

The needed of automation in the construction industry is urgent recently. The lack of manpower in this field especially site workers is one of the culprit. Also, injury or even fatality involve in construction site is still happening around the world. After consulting with Yau Lee Construction Company, we have decided to tackle the problem related to wall painting in construction site. Therefore, our group has designed a auto-painting machine to overcome this imminent problem.

Wall painting is a hazardous activity to human being. There are already many reports on the paint used that contain carcinogenic substances. Long-term exposure to these paint may cause cancer to workers. As a result, our group hope the design of this panting machine can help reduce the time the workers involved in this kind of activity.

## Design rationale

The painting machine is built with a caterpillar base which can move in construction site. We have also installed a linear guide rail on top of the base. The rail is used to hold the sprayer and moves in vertical direction. To move the sprayer up and down, we use a stepper motor as it can provide a more accurate movement. The sprayer has separating part with the pump at the middle of the rail.

For the programming part, we use Arduino boards for controlling the motion of the car and sprayer. We have installed some ultrasonic sensors for detecting the distance. We also use raspberry board for sending the camera view signal to the smartphone's app through Wi-Fi. Bluetooth module is used for communication between the painting machine and the android app.

## Conclusion and recommendations

More buildings will be completed in these decades. We hope this machine can be a new trend in the industry within few years. Cost reduction is one of the temptation for company to adopt this idea. Also, the efficiency will increase a lot if apply the machine properly. Moreover, this machine can further be used in other industry like automotive industry, wood painting… We believe this machine can save thousands of workers if it becomes a trend.
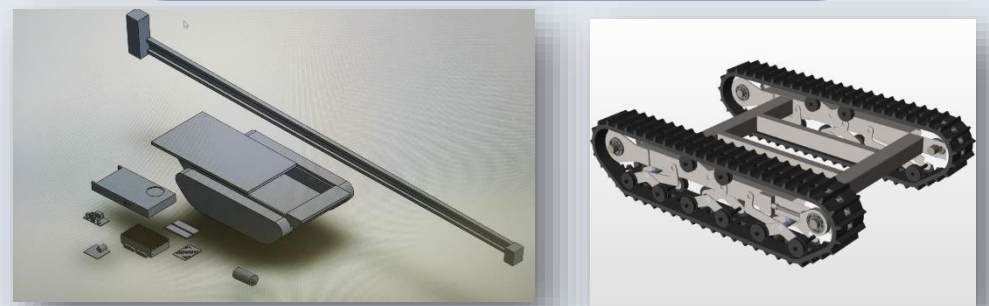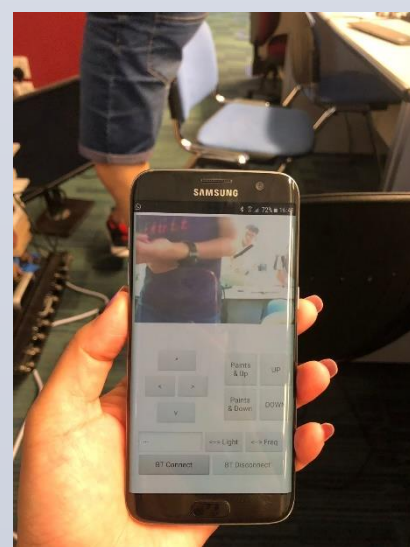
## Limitation and Difficulties

- The track reserves some area as buffer, so the painting gun cannot paint that area (such as the area near the edges, area below the base)
- It would cause the waste of painting material in the form of spraying.
- No waterproof in the base, it maybe breakdown due to permeating water.

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