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# 1 Introduction

Introduction

# 2 Mechanical design

$$y = f(x) \tag{1}$$

Equation [1](#) shows that...  
Thrun *et al.*[\[1\]](#) show that...

# 3 Electronics

## 3.1 NUC

## 3.2 Arduino

## 3.3 IMU

## 3.4 IR sensors

### 3.4.1 Calibration

### 3.4.2 Filtering

# 4 Motion control

Motion control

## **5 Software**

### **5.1 Global picture**

### **5.2 Odometry**

### **5.3 Mapping**

### **5.4 Exploration**

#### **5.4.1 Wall following**

#### **5.4.2 BFS Search**

### **5.5 Path planning**

#### **5.5.1 Global**

#### **5.5.2 Local**

### **5.6 Localization**

## **6 Computer Vision**

### **6.1 Camera extrinsic calibration**

### **6.2 Object detection**

### **6.3 Object recognition**

### **6.4 Obstacle detection**

## **7 Discussion**

### **7.1 Results**

### **7.2 System Evaluation**

### **7.3 Project management**

## **8 Conclusions**

Conclusions

## References

- [1] S. Thrun, W. Burgard, and D. Fox. *Probabilistic Robotics (Intelligent Robotics and Autonomous Agents)*. The MIT Press, 2005.