



Open Source
Sparkfun
Adafruit
Arduino
Data Sheet
APP Notes

Conceptual Design Presentation

Card Reader - Objective

The objective of the card reader is to design a device and software that captures, records, and retrieves cards.

Card Reader - Previous Research

Key features:
 - No battery
 - No moving parts
 - No need for a card to be inserted
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Card Reader - Solution

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Navigation Engineer

Objective:
 Design software and hardware to enable the robot to map and orient itself in a given environment.

Implementation Requirements:
 - The robot must be able to detect walls and other obstacles in its environment.
 - The robot must be able to detect the location of the walls and other obstacles in its environment.

Navigation Engineer Components

Key features:
 - No battery
 - No moving parts
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RGB Sensor

Implementation:
 - The sensor must be able to detect red, green, and blue light.
 - The sensor must be able to detect the intensity of the light.

RGB Sensor 1

Input Voltage	2.7V-5.5V
Red Color Value	25-37
Blue Color Value	25-37
Green Color Value	25-37
Distance	2.5cm-1.5m

RGB Sensor 2

Input Voltage	2.7V-5.5V
Red Color Value	25-37
Blue Color Value	25-37
Green Color Value	25-37
Distance	2.5cm-1.5m

RGB Sensor Conclusion

Key features:
 - No battery
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Navigation

The goal is to get information of the robot's location in order to achieve the task. This will be done by using a range of 3 to 4 sensors and one trigger sensor which will be the robot.

Navigation

Robot will be placed in a certain room and there will be four anchors on the corners of the room. This will help to obtain the position of the robot and measurement.

Triangulation

The goal is to get information of the robot's location in order to achieve the task. This will be done by using a range of 3 to 4 sensors and one trigger sensor which will be the robot.

Transceiver Information

Key features:
 - No battery
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Navigation Block Diagram

Citation

TCB 3000 Specification Sheet
<https://www.sparkfun.com/datasheets/robotics/TCB3000-311.pdf>

TCB3475 Specification Sheet
<https://www.sparkfun.com/datasheets/robotics/TCB3475.pdf>

DM6001 Specification Sheet
<https://www.sparkfun.com/datasheets/robotics/DM6001-1245032.pdf>

Control Engineer Objective

The robot has to be balanced on one wheel only without a ramp.

Control - Research

Key features:
 - No battery
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Control Engineer - Research

Key features:
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Control Engineer Sensors (cont'd)

Type/Height Sensor	Price	Distance range	Dimensions
Ultrasonic	\$14.95	5cm-160cm	2.5cm x 1.5cm x 2.5cm
IR	\$13.95	5cm-160cm	2.5cm x 1.5cm x 2.5cm

Control Engineer Conceptual Design Solution

Block Diagram of a control loop.

Control Implementation

Key features:
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Control - Flow Chart

Game Software Engineer - Objective

Design a way for the robot to complete the maze given the maze information by using the game rules to solve the maze.

Game Software - Research

Key features:
 - No battery
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Game Software - Conceptual Design (Mapping)

The robot would use a version of depth first search to map the maze. Since the robot physically moves through the maze, breadth first search would take longer for the robot to map the maze.

Flowchart Diagram of the Mapping Phase

Game Software - Conceptual Design (Game Solving)

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