CALDOG

Brief Introduction

CALDOG is a small mobile robot, calculates the simple arithmetic equations. CALDOG means a calculator and a dog.

Keywords: Human Robot Interaction, Mimicking Animal

Objectives

- **Backgrounds**
  - TV program, showing the dog which can identify the numbers
  - Actually the dog does not have notion of numbers.
  - The dog just matches the shape of numbers to the sound of numbers.
- **Focus on mimicking this kind of animal behaviour**

System Design

- The system can be divided into 3 parts.
  - **User Interface**
    - Keypad on the robot to gets the input.
    - LCD shows the typed number.
  - **Sensing**
    - IR sensors to trace a line
  - **Movement**
    - 2 Stepping motors to move
    - Robot arm consists of a servo motor and magnet

- Focus on mimicking the animal behaviour
  - So, I simplified the system
  - No vision system, No sophisticated robot arm
- Then **how to find the answer?**
  - The trick is that locating the answer blocks in order.
  - So the robot counts the order of the answer blocks to figure out its number.

CPU	ATmega128
Hardware	Stepping Motors, Servo Motor, Keypad, LCD, etc
Software	C (Using Atmel AVR Studio)

How It Works

- Preparation
  - Blocks are numbered from 0 to 10.
  - Place the blocks along the line in order.
  - Place the robot on the start line.

1. A user inputs a simple arithmetic equation. (e.g. 3 + 2)

2. CALDOG sniffs along the line to find the answer.

3. When it finds the answer, it picks up the answer and returns.
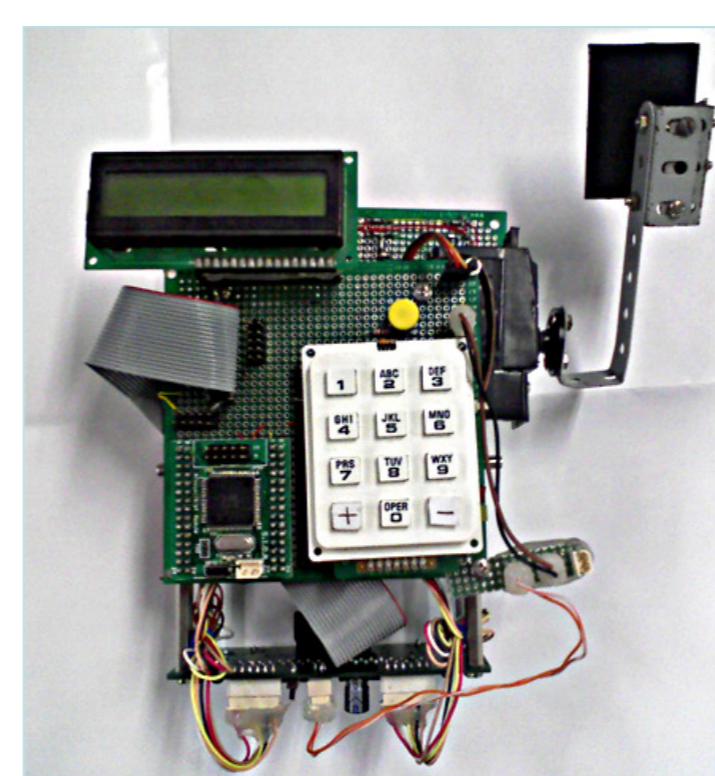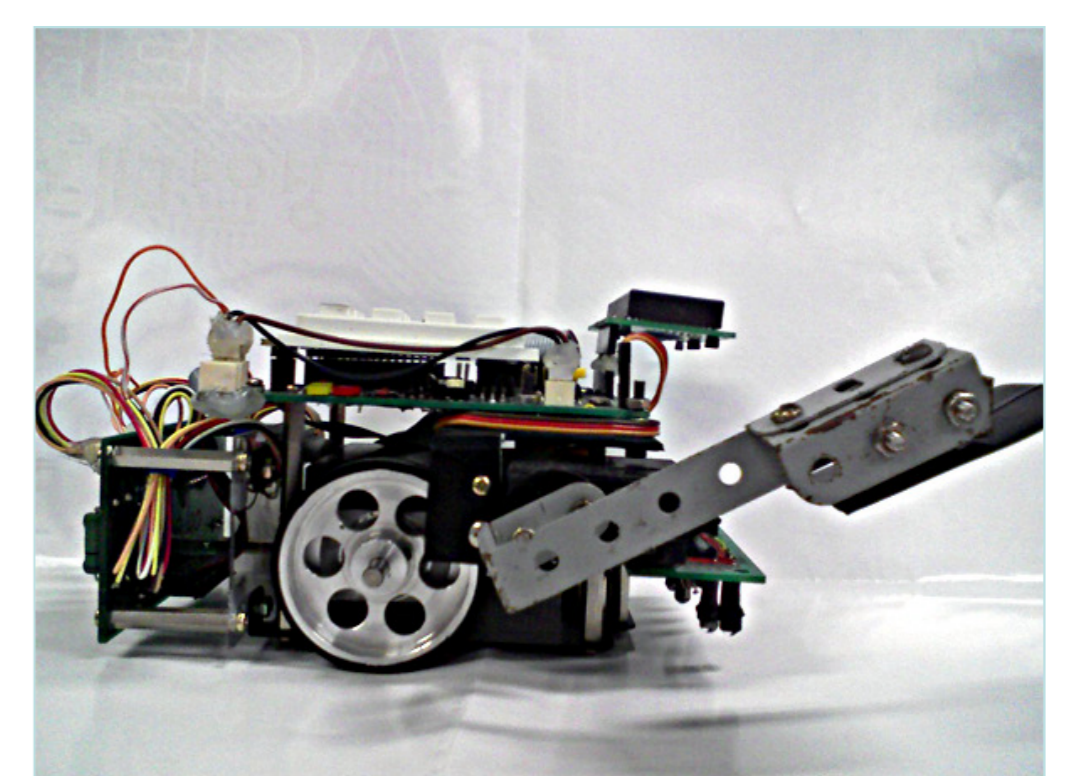
Results

Figure 1. Top view

Figure 2. Side view

Limitations

- Limited range of inputs
  - the answer should be between 0 to 10

- Very simple robot
  - Need to add more features