



Robotics Lab

Project NXT - Slot Machine B Robotics Practical

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- 5 Summary
- 6 Let's play slot machine!

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Basic Information of the project:

- Supervisors: Monika Harant, Prof. Katja Mombaur
- The goals of this project are to construct a physical slot machine and to program it using NXC (Not eXactly C).

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Milestones

- Beginning of June 2012: Start Project
- Project Working Hours: 4 hours per week
- By the middle of June: Design of the reels is finished
- By the end of June: Construction of the slot machine is ready
- By the middle of July: Program is finished
- By the end of July: Presentation of my project, homepage and poster

- Three reels: constructed with three motors
- Three pictures on reels: Apple, Banana, Mango



- Coin slot is designed with color sensor:



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- Lever is designed with touch sensor:



- Programming unit is Brick NXT 2.0:



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- Body of slot machine is constructed with Lego:



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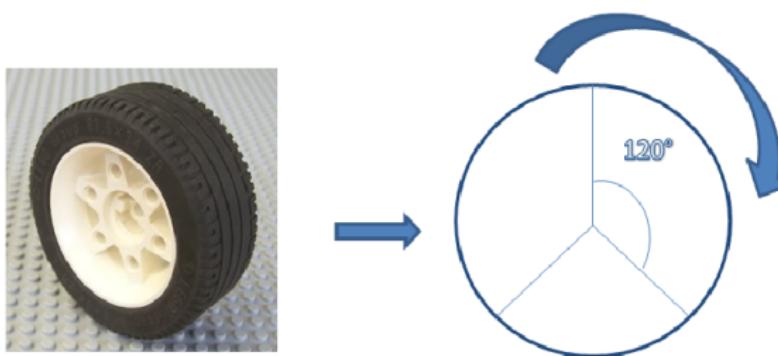
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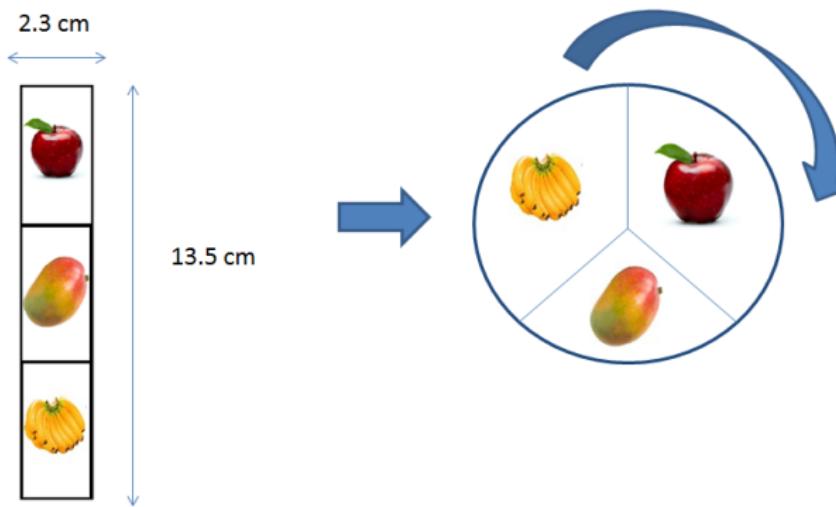
Reels Design I

- Three Reels: each reel is divided in three equal angles (120 degree)

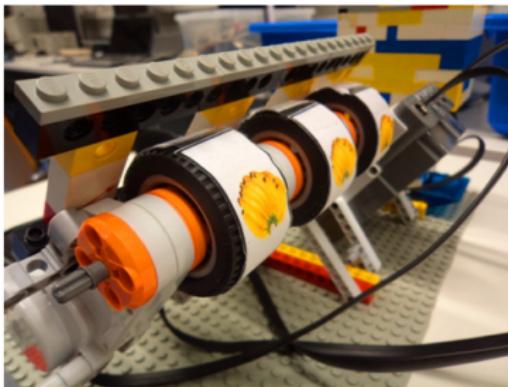
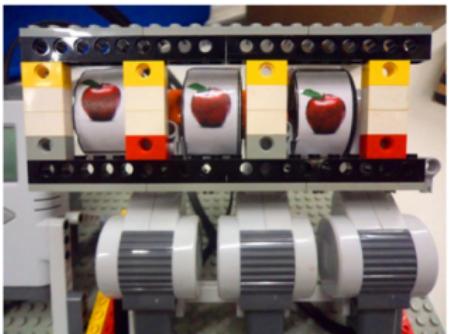


Reels Design II

- Three picture planes: Apple, Banana, Mango are cut and designed to be parallel with size of the reels.



Reels Design III



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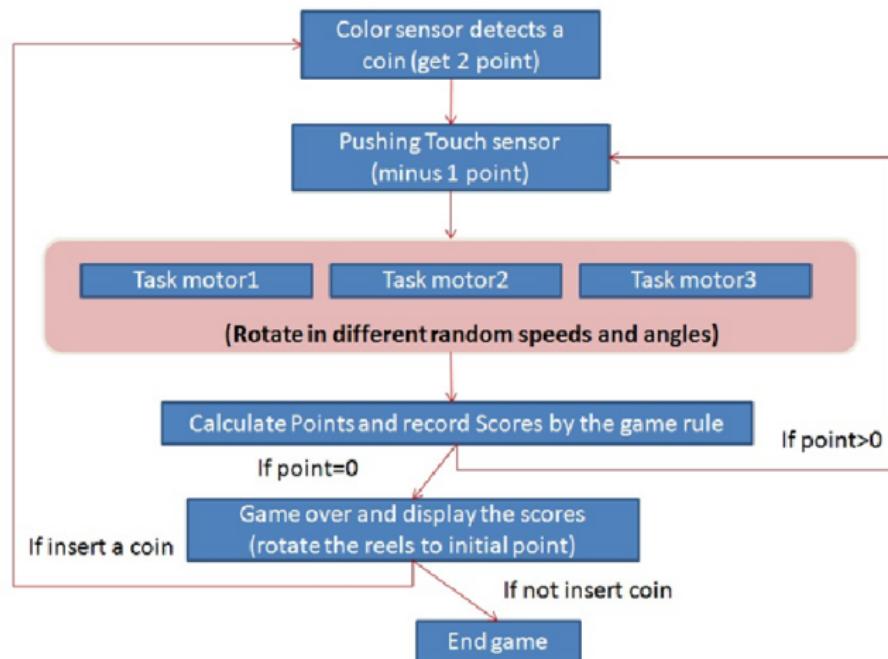
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Program Structure



Coin Slot and Color Sensor

```
SetSensorColorFull(S1); //for the coin
SetSensor(IN_2,SENSOR_TOUCH); // for the lever
i=2; //2 points per coin

until(INPUT_BLUECOLOR!=SENSOR_1); //put the coin
ClearScreen();
s=0;
s1=0;
s2=0;
s3=0;

.
```

Lever and Touch Sensor

```
Acquire(moveMutex1); //protect other task execution while the motor1,2,3 rotate
Acquire(moveMutex2);
Acquire(moveMutex3);

until(SENSOR_2 == 1); // push lever
i=i-1;

ClearScreen();
TextOut(15,LCD_LINE1,"You have");
NumOut(20,LCD_LINE2,i);
TextOut(27,LCD_LINE2,"X left");
Wait(1500);

ClearSensor(IN_2);
ClearScreen();

//motor1,2,3 rotate at the same time
StartTask(motor1);
StartTask(motor2);
StartTask(motor3);
```

Random Speed and Angles

```
//The random speed of motor A: 25,30,50,...,75
#define A 50/Random(5)+25
#define B 50/Random(5)+25
#define C 50/Random(5)+25
```

```
//The random angle: 120,240,360,480,...,2400,2520,2640
#define D 120*(Random(10)+12)
```

Reels Rotation

```
// rotate motor1
task motor1()
{
    da=D; // rotate in a random angles
    d1=(da+120+d1)%360; //find the position of the angle
    RotateMotor(OUT_A, A,-da);
    RotateMotor(OUT_A,15,-120);
    Off(OUT_A);

    //Display the result on the screen:

    if (d1==0){TextOut(30,LCD_LINE1,"Apple");s1=360;}
    if (d1==120){TextOut(30,LCD_LINE1,"Banana");s1=120;}
    if (d1==240){TextOut(30,LCD_LINE1,"Mango");s1=240;}
    NumOut(0,LCD_LINE1,s1);

    Release(moveMutex1);
    //execute other tasks after finishing rotating the motor
}
```

Game Rule

- if($d1 \neq d2 \ \&\& \ d1 \neq d3 \ \&\& \ d2 \neq d3$)
// 3 different pictures
 - $i = i - 1;$ // minus 1 point
 - $s = (s - (s1 + s2 + s3) * 3);$ // minus scores
- if($(d1 == d2 \ \&\& \ d1 \neq d3) | | (d1 == d3 \ \&\& \ d1 \neq d2) | | (d2 == d3 \ \&\& \ d2 \neq d1)$)
// 2 same pictures
 - $s = s + s1 + s2 + s3;$ // add score
- if($(d1 == d2) \ \&\& \ (d1 == d3)$)
// 3 same pictures
 - $i = i + 3;$ // add 3 points
 - $s = (s + s1 + s2 + s3) * 3;$ // add scores

Routine of Sound and Display

```
PlayFileEx("!\ FanFare.rso",2, FALSE); //play sound file

TextOut(15,LCD_LINE4,"Your score:");
NumOut(30,LCD_LINE5,s);
TextOut(15,LCD_LINE7,"Insert coin...");
```

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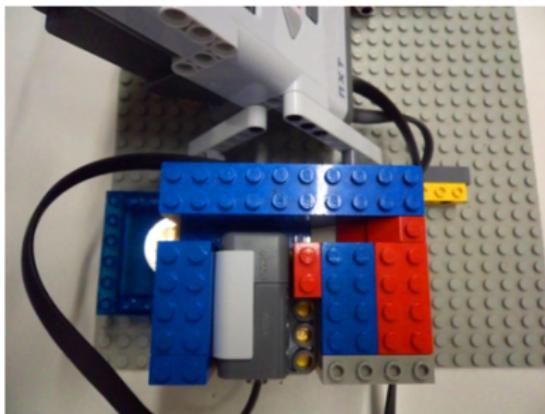
3 Programming Part

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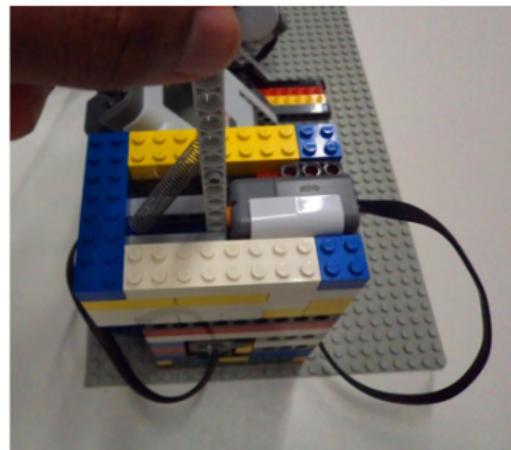
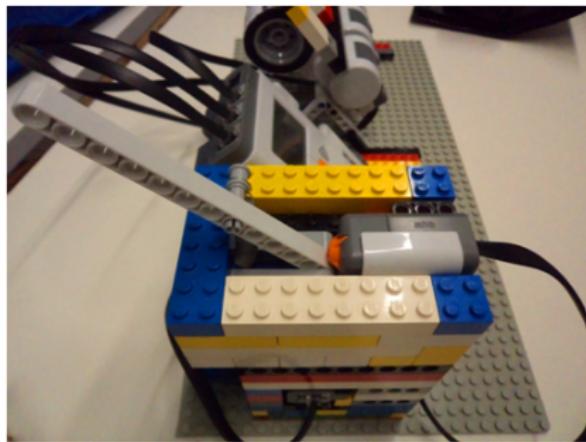
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Coin Slot Design



Lever Design



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- Programming for the rotation of the reels
- Coin slot and lever design
- Short of time

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Future work:

- Improving the coin slot: distinguish various coins
- Constructing coin paying machine

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please visit: www.youtube.com/watch?v=ItIpe3DkpU

