Game Dev. With the Educational Booster Pack MKII

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Outline

-Motivation
- The Game Cycle
- The hardware
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- Conclusion

Motivation

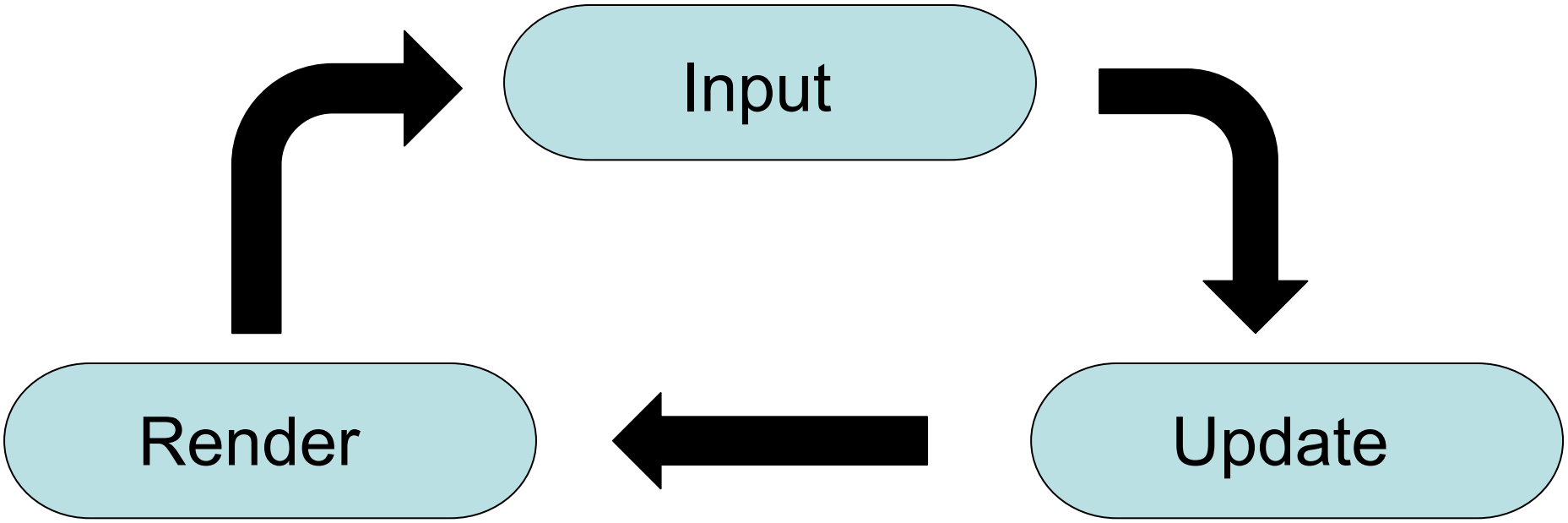
- Educational Booksterpack MK II has *loads* of inputs / outputs

- It also has *loads* of constraints!

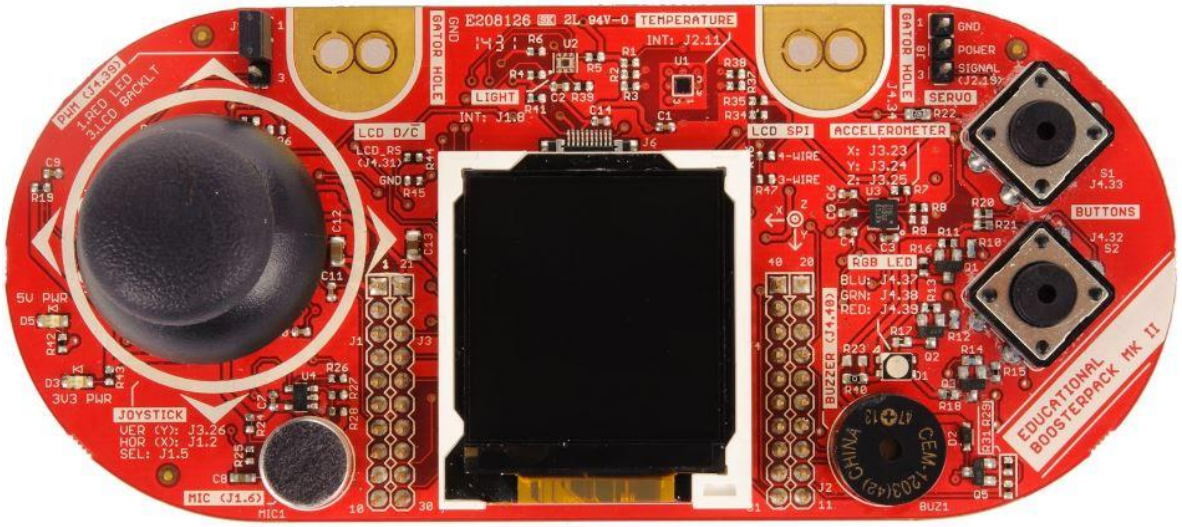
- As such, it has *loads* of educational potential!

- Making games is *loads* of fun!

The Game Cycle



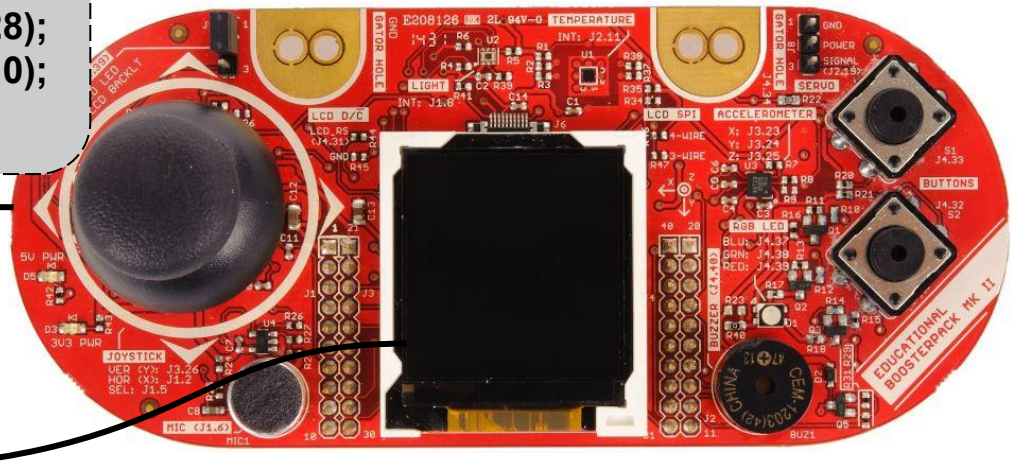
The Platform



MSP430F5529 + Educational Boosterpack MK II

What we're using...

```
#define joystickX 2
#define joystickY 26
x = map(analogRead(joystickX), 0, 4096, 0, 128);
y = map(analogRead(joystickY), 0, 4096, 128, 0);
```




```
// 128 x 128 16-bit color
#include <SPI.h>
#include <LCD_screen.h>
#include <Screen_HX8353E.h>
Screen_HX8353E draw;
```

The Basic Setup

```
#include <library.h>
int globalVariables;
```

Head: Library declarations, global scope variables

```
void setup( ){
initFunctions( );
}
```

Setup: Initialization functions

```
void loop( ){
//game loop goes here
}
```

Loop: Where the game-loop lives.

Head

```
#include "Energia.h"
#include <SPI.h>
#include <LCD_screen.h>
#include <LCD_screen_font.h>
#include <Screen_HX8353E.h>

Screen_HX8353E draw;
#define joystickX 2
#define joystickY 26
float x, y, x00, y00, t, ballx, bally, ballx0,bally0, ballvx, ballvy;
int score;
bool count = true;
```

setup( )

```
void setup( ){
   draw.begin();
   x00 = 0;
   y00 = 0;
   ballx0 = 126/2;
   bally0 = 126/2;
   ballx = 126/2;
   bally = 126/2;
   ballvx = random(-1,1);
   ballvy = 1;
   t = 0;
   score = 0;

}
```

loop( )

```
void loop( ){

    input( );
    update( );
    render( );

    t += 1;
}
```

update( )

```
void update(){

        ballx = ballx0 + ballvx;
        bally = bally0 + ballvy;

        if(ballx > 120){
        ballvx = -1;}
        else if(ballx < 5){
        ballvx = 1;}
        if(bally > 120){
        ballvy = -1;}
        else if(bally < 5){
        ballvy = 1;}

        if(abs(ballx-x) < 10 && abs(bally-100) < 5){
        if(count == true){
        score++;
          count = false; }
        ballvy = random(-1,1);
        ballvx = random(-1,1);

        }

  if(abs(ballx-x) > 10 && abs(bally-100) > 5){
        count = true;}

  if(bally > 110){
        gameOver();}

}
```

- If the ball hits a wall, bounce back.
- If the ball hits the paddle, bounce back at a random angle and increase the score.
- If the ball hits the floor, game over!

gameOver( )

```
void gameOver(){

draw.gText(0, (draw.screenSizeY( ) - draw.fontSizeY( ))/2, "GAME OVER!",
0b1111111111111111);

delay(1000);
setup( );
}
```

render( )

```
void render(){
      draw.clear( );
      draw.setPenSolid(true);
       draw.dRectangle(ballx-1, bally-1, 3, 3, 0b1111111111111111);

       ballx0 = ballx;
       bally0 = bally;

       draw.line(x-1, 100, x-10, 100, 0b1111111111111111);

      x00 = x;
      draw.gText(0, draw.screenSizeY()-draw.fontSizeY(), "Score= " +
      String(score), 0b1111111111111111);

}
```

THIS WON'T WORK!

render( )

```
void render(){
      draw.setPenSolid(true);

      draw.dRectangle(ballx0-1, bally0-1, 3, 3, 0b0000000000000000);
      draw.dRectangle(ballx-1, bally-1, 3, 3, 0b1111111111111111);
      ballx0 = ballx;
      bally0 = bally;

      draw.line(x00-1, 100, x00-10, 100, 0b0000000000000000);
      draw.line(x-1, 100, x-10, 100, 0b1111111111111111);

      x00 = x;
      draw.gText(0, draw.screenSizeY()-draw.fontSizeY(), "Score= " +
       String(score), 0b1111111111111111);
}
```

Future Work

- Will feature in a part of my thesis.
- Develop more interesting games (now that I have the time)
- Develop educational materials (?).

Conclusion

- The Educational Boosterpack MK II has a great deal of potential

- Has some interesting constraints that call for interesting solutions. (This is a good thing!)

- Is fun!

- Special thanks to Rei Vilo!

Questions?

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On github: github.com/trevortomesh

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