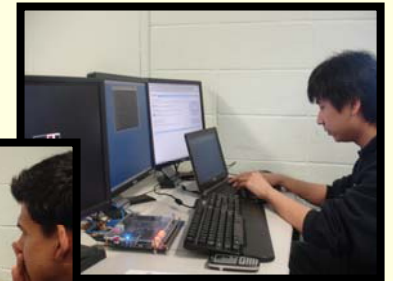
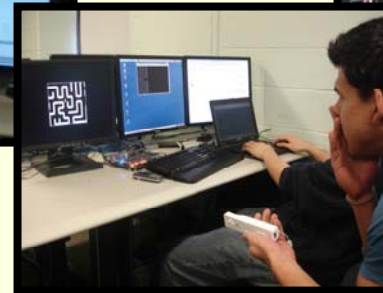
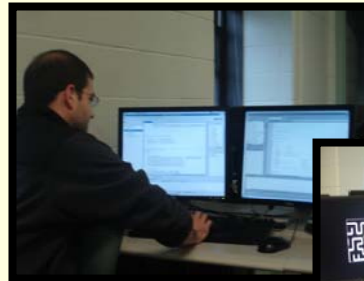


THE WIMMIZE

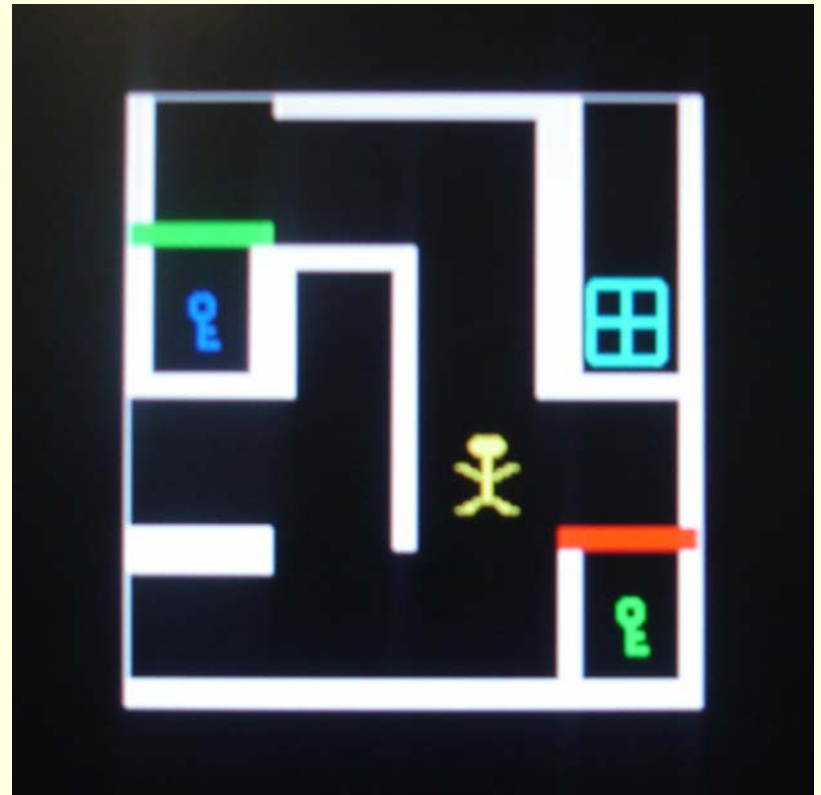
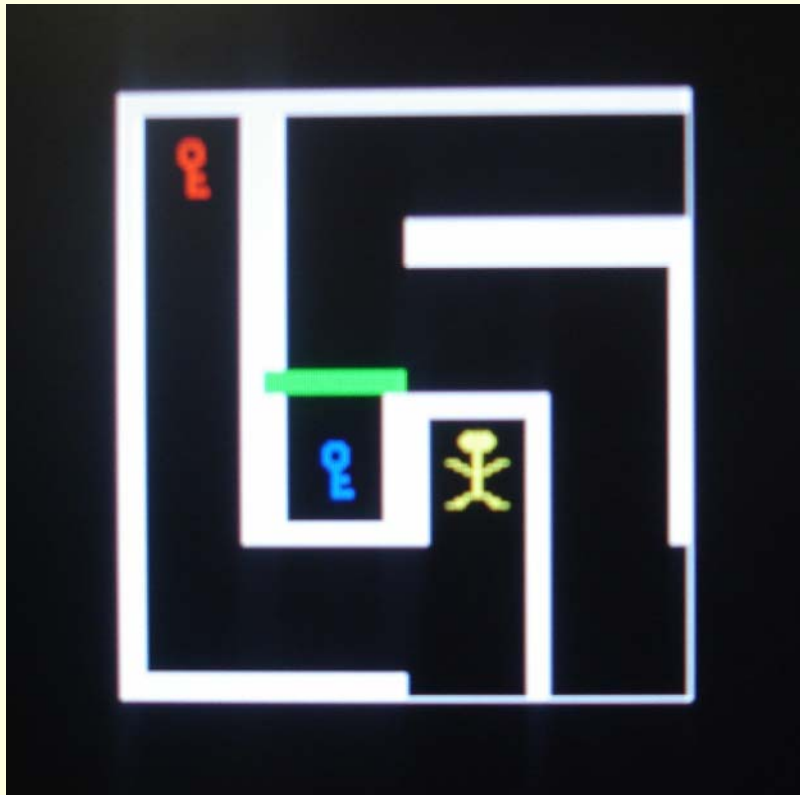
SHAUN SALZBERG

MIKE LU

BRIAN RAMOS



THE GAME



HARDWARE OVERVIEW

- ACTUAL MAZE, OBJECT, GOAL, AND CHARACTER TILES
- VIRTUAL MAZE AND OBJECT TILES
- MAZE AND OBJECT DESCRIPTORS
- OTHER SIGNALS
- VIRTUAL SCREEN SPACE
- PIXEL DRAWING SCHEME

VIRTUAL TILES

MAZE VIRTUAL TILES

BITS 7 - 6: INDEX INTO MAZE_TILES

BITS 5 - 4: ROTATION

BITS 3 - 0: NO LONGER USED

```
type virtual_maze_tile_type is array(0 to 14) of unsigned(7 downto 0);
constant VIRTUAL_MAZE_TILES : virtual_maze_tile_type := ( "00000111",
                                                         "00011101",
                                                         "00101011",
                                                         "00111110",
                                                         "01000101",
                                                         "01011001",
                                                         "01101010",
                                                         "01110110",
                                                         "10000011",
                                                         "10011100",
                                                         "11000010",
                                                         "11010100",
                                                         "11100001",
                                                         "11111000",
                                                         "11111111" );
```

```
constant LEFT_WALL      : unsigned(3 downto 0) := "0000";
constant TOP_WALL       : unsigned(3 downto 0) := "0001";
constant RIGHT_WALL     : unsigned(3 downto 0) := "0010";
constant BOTTOM_WALL    : unsigned(3 downto 0) := "0011";
constant TOP_LEFT_CORNER : unsigned(3 downto 0) := "0100";
constant TOP_RIGHT_CORNER : unsigned(3 downto 0) := "0101";
constant BOTTOM_RIGHT_CORNER : unsigned(3 downto 0) := "0110";
constant BOTTOM_LEFT_CORNER : unsigned(3 downto 0) := "0111";
constant VERTICAL_HALL   : unsigned(3 downto 0) := "1000";
constant HORIZONTAL_HALL : unsigned(3 downto 0) := "1001";
constant BOTTOM_DEADEND  : unsigned(3 downto 0) := "1010";
constant LEFT_DEADEND   : unsigned(3 downto 0) := "1011";
constant TOP_DEADEND    : unsigned(3 downto 0) := "1100";
constant RIGHT_DEADEND  : unsigned(3 downto 0) := "1101";
constant NO_MAZE_TILE   : unsigned(3 downto 0) := "1110";
```

OBJECT VIRTUAL TILES

BIT 8: INDEX INTO OBJ_TILES

BITS 7 - 6: ROTATION

BITS 5 - 4: COLOR

BITS 3 : 0: NO LONGER USED

```
type virtual_obj_tile_type is array(0 to 15) of unsigned(8 downto 0);
constant VIRTUAL_OBJ_TILES : virtual_obj_tile_type := ( "000000111",
                                                         "001001101",
                                                         "010001011",
                                                         "011001110",
                                                         "000010111",
                                                         "001011101",
                                                         "010011011",
                                                         "011011110",
                                                         "000100111",
                                                         "001101101",
                                                         "010101011",
                                                         "011101110",
                                                         "100001111",
                                                         "100011111",
                                                         "100101111",
                                                         "111111111" );
```

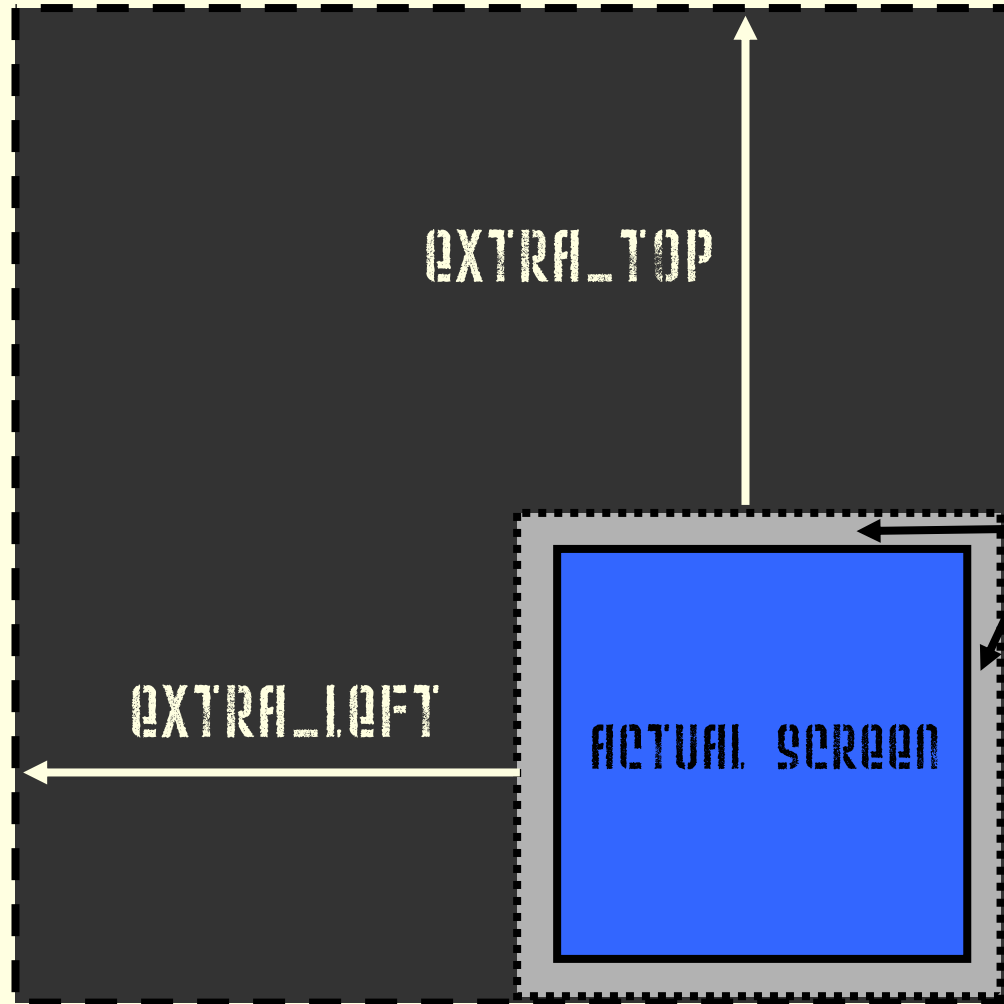
```
constant LEFT_WALL_RED      : unsigned(3 downto 0) := "0000";
constant TOP_WALL_RED       : unsigned(3 downto 0) := "0001";
constant RIGHT_WALL_RED     : unsigned(3 downto 0) := "0010";
constant BOTTOM_WALL_RED    : unsigned(3 downto 0) := "0011";
constant LEFT_WALL_GREEN   : unsigned(3 downto 0) := "0100";
constant TOP_WALL_GREEN    : unsigned(3 downto 0) := "0101";
constant RIGHT_WALL_GREEN  : unsigned(3 downto 0) := "0110";
constant BOTTOM_WALL_GREEN  : unsigned(3 downto 0) := "0111";
constant LEFT_WALL_BLUE    : unsigned(3 downto 0) := "1000";
constant TOP_WALL_BLUE     : unsigned(3 downto 0) := "1001";
constant RIGHT_WALL_BLUE   : unsigned(3 downto 0) := "1010";
constant BOTTOM_WALL_BLUE  : unsigned(3 downto 0) := "1011";
constant KEY_RED           : unsigned(3 downto 0) := "1100";
constant KEY_GREEN        : unsigned(3 downto 0) := "1101";
constant KEY_BLUE         : unsigned(3 downto 0) := "1110";
constant NO_OBJ_TILE      : unsigned(3 downto 0) := "1111";
```


OTHER SIGNALS

- *MAZE_X_OFFSET, MAZE_Y_OFFSET*
- *CUR_XPOS_PIX, CUR_YPOS_PIX*
- *END_XPOS_PIX, END_YPOS_PIX*
- *HALF_WINDOW_SIZE_X, HALF_WINDOW_SIZE_Y*
- *WHICH_KEYS, WHICH_CHAR_TILE*

VIRTUAL SCREEN SPACE

(0,0)



EXTRA_TOP

EXTRA_LEFT

ACTUAL SCREEN

SYNC, BACKPORCH,
FRONTPORCH, ETC...

PIXEL DRAWING SCHEME

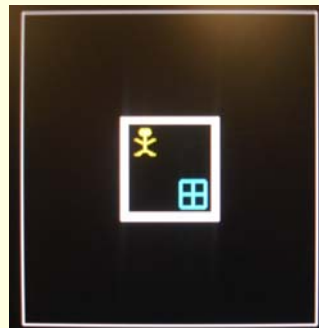
- IF PIXEL IS OUTSIDE WINDOW, IT IS BLACK
- IF PIXEL IS ON WINDOW BORDER, IT IS WHITE
- IF PIXEL IS WITHIN CHARACTER TILE AND ENTRY IN THAT TILE IS 1, IT IS YELLOW.
- IF PIXEL IS WITHIN OBJECT TILE, AND ENTRY IN THAT TILE IS 1, IT IS THE OBJECT COLOR (RED, BLUE, OR GREEN)
- IF PIXEL IS WITHIN GOAL TILE AND ENTRY IN THAT TILE IS 1, IT IS LIGHT BLUE.
- IF PIXEL IS WITHIN MAZE TILE AND ENTRY IN THAT TILE IS 1, IT IS WHITE.
- ELSE IT IS BLACK

INTERACTING HARDWARE WITH SOFTWARE

```
// maze tile info
// first row
the_level[DESC_MAZE_OFFSET+0][0] = TOP_LEFT_CORNER;
the_level[DESC_MAZE_OFFSET+0][1] = TOP_RIGHT_CORNER;
for(i = 2; i < MAX_MAZE_SIZE_X; i++ ) the_level[DESC_MAZE_OFFSET+0][i] = NO_MAZE_TILE;

// second row
the_level[DESC_MAZE_OFFSET+1][0] = BOTTOM_LEFT_CORNER;
the_level[DESC_MAZE_OFFSET+1][1] = BOTTOM_RIGHT_CORNER;
for(i = 2; i < MAX_MAZE_SIZE_X; i++ ) the_level[DESC_MAZE_OFFSET+1][i] = NO_MAZE_TILE;

// rest of the rows
for(i = DESC_MAZE_OFFSET+2; i <= MAX_MAZE_SIZE_Y; i++ ) {
    for( j = 0; j < MAX_MAZE_SIZE_X; j++ )
        the_level[i][j] = NO_MAZE_TILE;
}
```



SOFTWARE INFRASTRUCTURE

- UCLINUX
- BLUEZ LIBRARY
- LIBWIMOTE LIBRARY
- COMPILING APPS
- RUNNING

THE PROGRAM

- ACCELEROMETER READINGS
- WIMOTE_UPDATE