

ECE 270: Computer Methods in ECE



**Final Project**  
Customize My Ride

Hussein El-Souri April 28,

2017

# 1 Statement of the Problem

My project is a simple project that allows one to customize a car.

# 2 Description of Solution

In this project I used openframework paths to draw the front,back and side "skeleton" of the car such that i designated a function for each of those(frontCar, sideCar, and BackCar respectively).

Each of those functions take in a path and draw the "skeleton" according to that path.

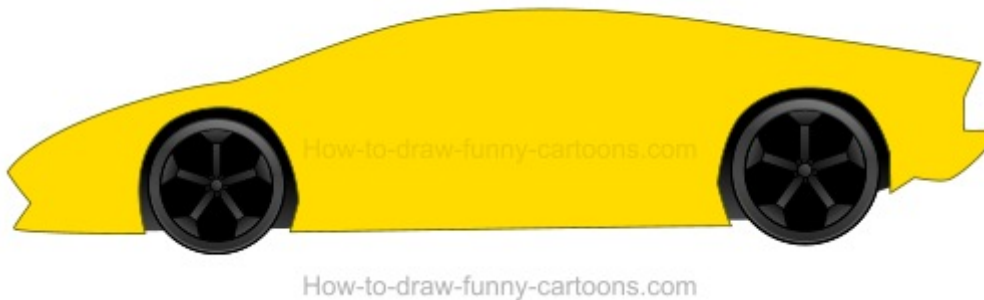
Four more functions were created for the details in the front,side,and back(frontDetail,sideDetails, and backDetails repectively).

A GUI (Graphical User Interface)was created to control which view the user is loking at along with whether or not music is playing.

The GUI also controls the color of the car,tires alon with the Entire position both along the X and Y.

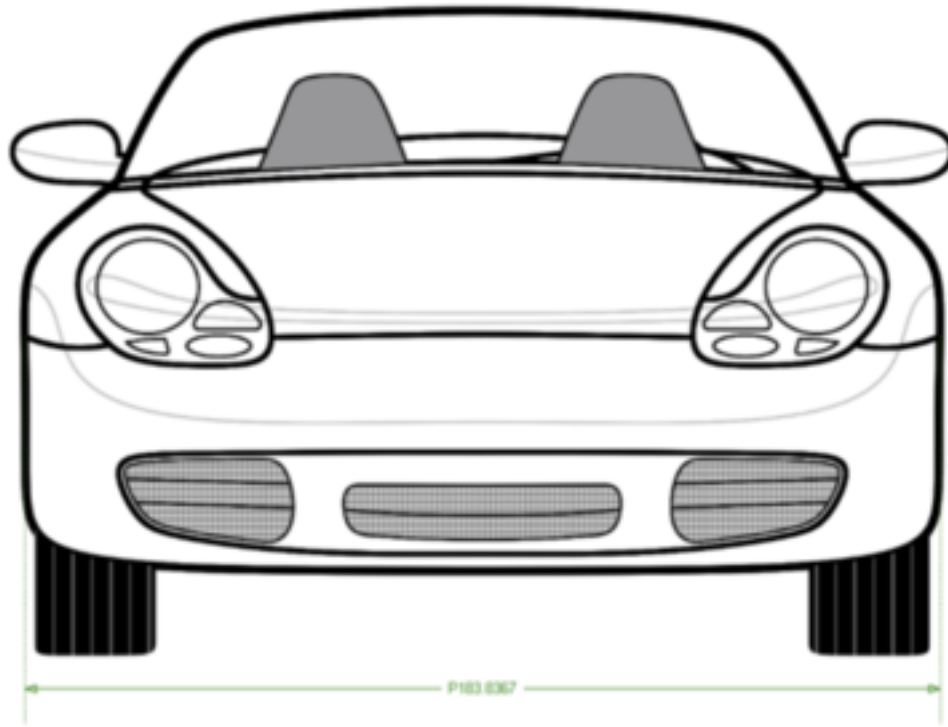
The project focuses more on pathing and shape creation and that is where the real work is.

The sideCar function takes in a path and draws the path along specific certain points.



This picture was used as a "design schematic" or inspiration for my design. Similar to pathing using the pentool on phtotoshop. In fact a bit of photoshop was used to help with the pathing and the pixel designation.

For the frontCar function it also takes in a path that follows the design of this picture.



The backCar is the same as the frontCar but the details are different.

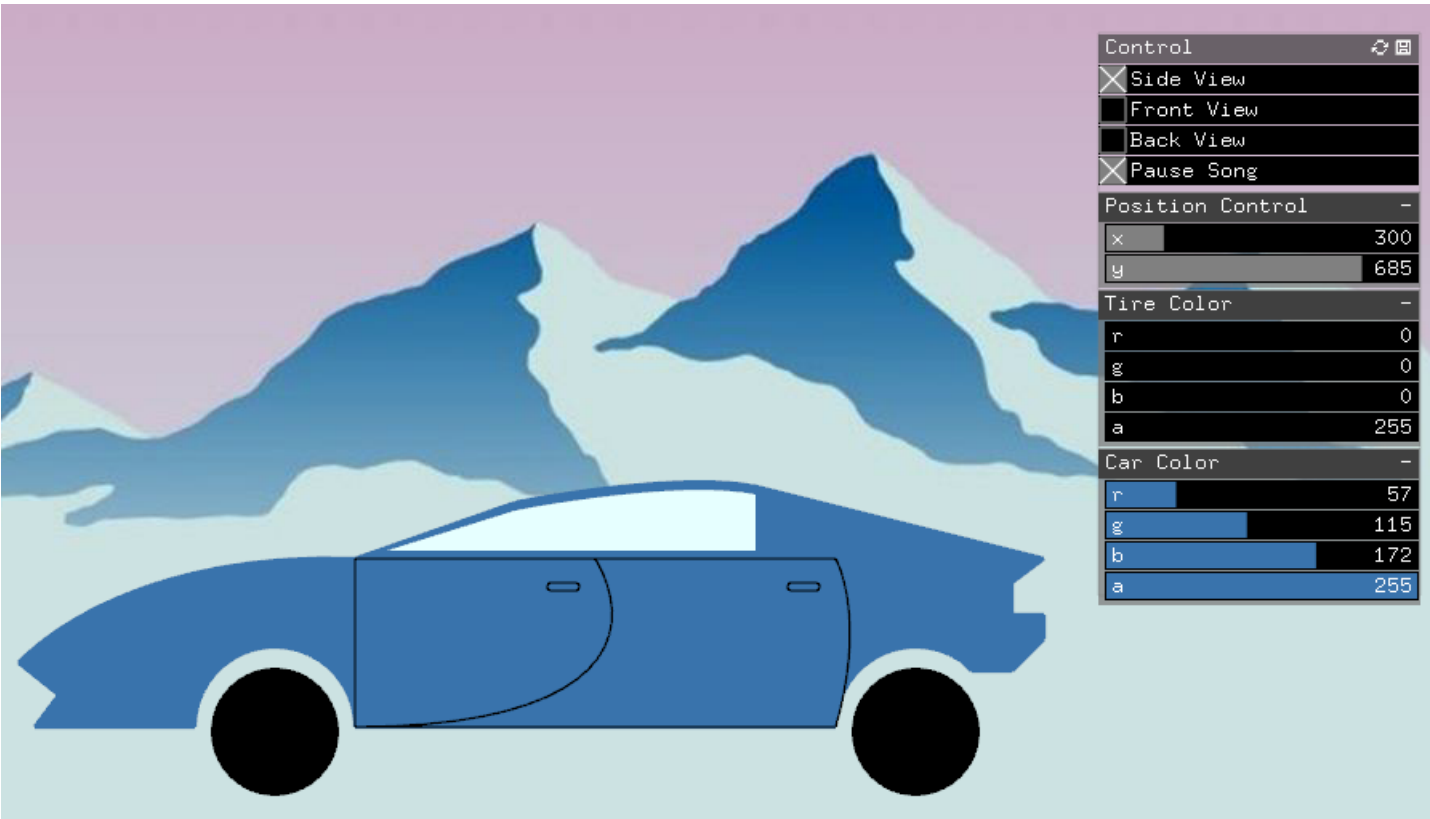
and here is where the "details functions" come in. These draw details on the car. Some of these details include doors, handles and windows on the side, windshield and hood in the front, and windshield and trunk in the back.

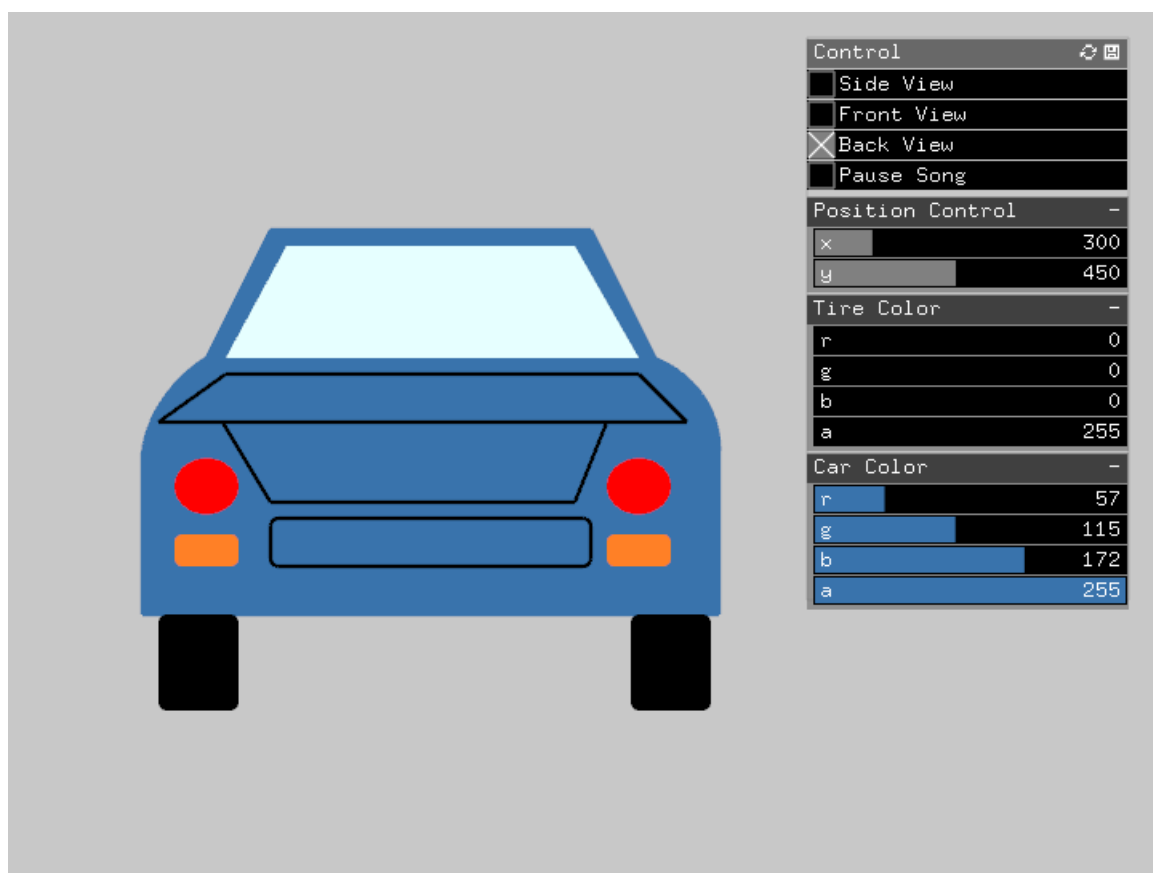
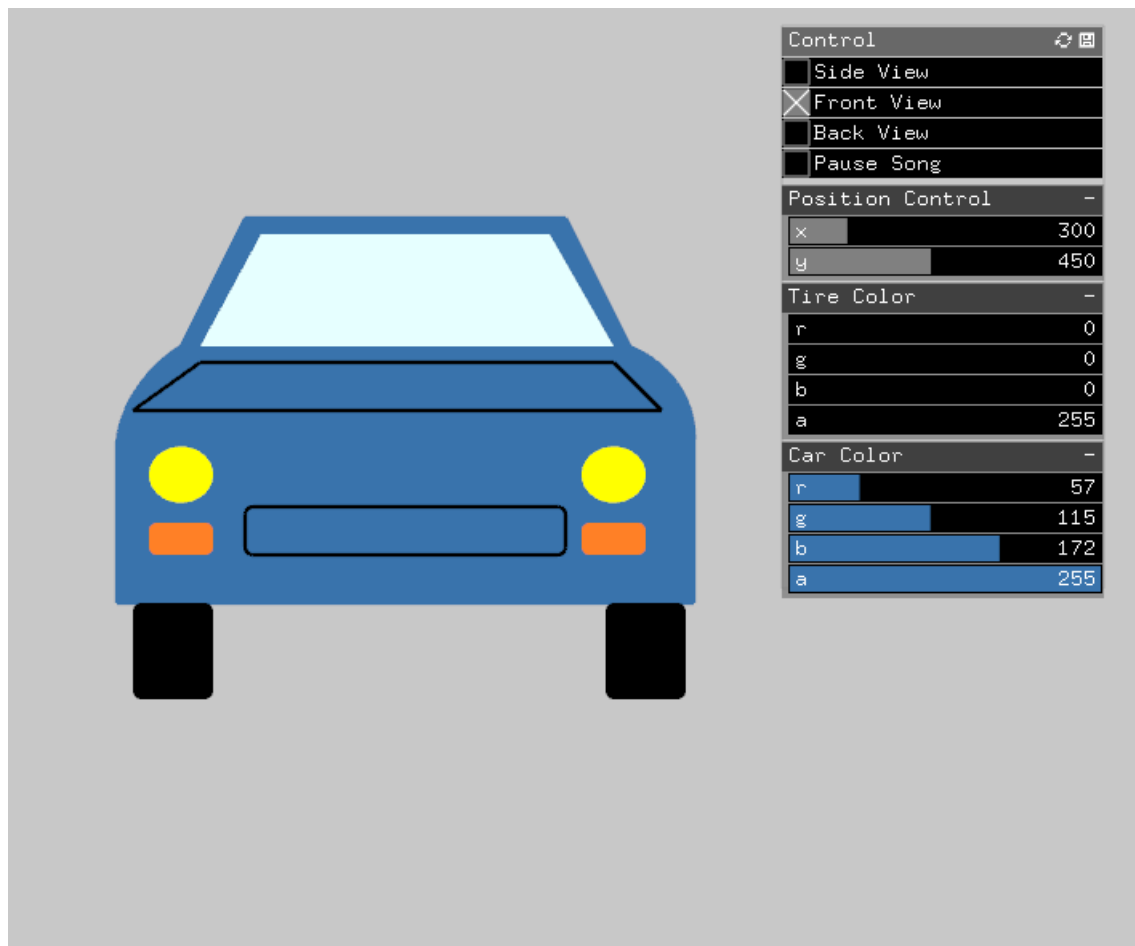
The path's initial position is controlled by a slider through a GUI. The colors of the tire and car are controlled independently through another GUI.

The Project end result is something very simple; however pathing and shape creation are very difficult and time consuming.

**Please check powerpoint presentation provided with project code in the zip file**

3    Testing and Output





## 4 Code

---

```
//---ofApp.h

    ofPath sidePath;
    ofPath frontPath;
    ofPath backPath;
    ofVec2f startPos;

    void sideCar(ofPath tempPath);
    void sideDetails();
    //---
    void frontCar(ofPath tempPath);
    void frontDetails();
    //--
    void backCar(ofPath tempPath);
    void backDetails();
    //--
    ofVec2Slider posControl;
    ofColorSlider tireColor;
    ofColorSlider carColor;
    //--
    ofxPanel viewGui;
        ofxToggle sideView;
    ofxToggle frontView;
    ofxToggle backView;
    ofxToggle songPlay;
    //--
    ofSoundPlayer mySong;

//-----
//-----
//---ofApp.cpp
void ofApp::sideDetails(){

    //---Doors
    ofNoFill();
    ofSetColor(0,0,0);
    ofSetLineWidth(1.5);
    ofBeginShape();
        ofVertex(posControl->x,posControl->y);
        ofVertex(posControl->x,posControl->y-105);
        ofVertex(2*posControl->x,posControl->y-105);
        ofPoint pt1,pt2,pt3;
        pt1.set(2*posControl->x,posControl->y-105);
        pt2.set(2*posControl->x+20,posControl->y-70);
        pt3.set(2*posControl->x,posControl->y);
        ofBezierVertex(pt1,pt2,pt3);
        ofVertex(posControl->x,posControl->y);
        ofPoint pt4,pt5,pt6;
        pt4.set(posControl->x+150,posControl->y);
        pt5.set(posControl->x+180,posControl->y-53);
        pt6.set(posControl->x+150,posControl->y-105);
        ofBezierVertex(pt4,pt5,pt6);
    ofEndShape();
    //---handles
    ofRectRounded(posControl->x+120,posControl->y-90,20,5,20);
    ofRectRounded(posControl->x+270,posControl->y-90,20,5,20);
    //---side windows
    ofSetColor(230, 255, 255);
    ofFill();
    ofBeginShape();
        ofVertex(posControl->x+20,posControl->y-110);
        ofVertex(posControl->x+100,posControl->y-135);
```

```

        ofPoint pt7,pt8,pt9;
        pt7.set(posControl->x+100,posControl->y-135);
        pt8.set(posControl->x+200,posControl->y-155);
        pt9.set(posControl->x+250,posControl->y-145);
        ofBezierVertex(pt7,pt8,pt9);
        ofVertex(posControl->x+250,posControl->y-110);
        ofVertex(posControl->x+20,posControl->y-110);
        ofEndShape();
    }

void ofApp::sideCar(ofPath tempPath){
    //-- car
    tempPath.setFill-color(carColor);
    tempPath.setStrokeColor(carColor);
    tempPath.setStrokeWidth(2.5);
    tempPath.setArcResolution(200);
    tempPath.moveTo(posControl->x-100,posControl->y);
    tempPath.lineTo(posControl->x-200,posControl->y);
    tempPath.lineTo(posControl->x-185,posControl->y-20);
    tempPath.lineTo(posControl->x-210,posControl->y-40);
    ofPoint pt1,pt2,pt3;
    pt1.set(posControl->x-210,posControl->y-40);
    pt2.set(posControl->x-150,posControl->y-110);
    pt3.set(posControl->x,posControl->y-105);
    tempPath.bezierTo(pt1,pt2,pt3);
    tempPath.lineTo(posControl->x+100,posControl->y-140);
    ofPoint pt4,pt5,pt6;
    pt4.set(posControl->x+100,posControl->y-140);
    pt5.set(posControl->x+200,posControl->y-160);
    pt6.set(posControl->x+250,posControl->y-150);
    tempPath.bezierTo(pt4,pt5,pt6);
    tempPath.lineTo(2*posControl->x+130,posControl->y-105);
    tempPath.lineTo(2*posControl->x+110,posControl->y-90);
    tempPath.lineTo(2*posControl->x+110,posControl->y-70);
    tempPath.lineTo(2*posControl->x+130,posControl->y-70);
    tempPath.lineTo(2*posControl->x+130,posControl->y-55);
    tempPath.lineTo(2*posControl->x+110,posControl->y-35);
    tempPath.lineTo(2*posControl->x+85,posControl->y-35);
    tempPath.arcNegative(2*posControl->x+50,posControl->y,50,50,-55,180);
    tempPath.lineTo(posControl->x,posControl->y);
    tempPath.arcNegative(posControl->x-50,posControl->y,50,50,0,180);
    tempPath.close();
    tempPath.draw();
    //--tires
    ofSetColor(tireColor);
    ofFill();
    ofSetCircleResolution(200);
    ofCircle (posControl->x-50,posControl->y+3,40);
    ofCircle (2*posControl->x+50,posControl->y+3,40);
    sideDetails();
}

void ofApp::frontDetails(){

    //--front bumper
    ofNoFill();
    ofSetColor(0,0,0);
    ofSetLineWidth(2.5);
    ofRectRounded(posControl->x+120,posControl->y-110,200,30,5);
    //--front tires
    ofFill();
    ofSetColor(tireColor);
    ofRectRounded(posControl->x+50,posControl->y-50,50,60,5);
    ofRectRounded(posControl->x+345,posControl->y-50,50,60,5);
}

```

```

//----front lights
ofSetColor(255, 255, 0);
ofEllipse(posControl->x+80,posControl->y-130,40,35);
ofEllipse(posControl->x+350,posControl->y-130,40,35);
//----front blinkers
ofSetColor(255, 128, 38);
ofRectRounded(posControl->x+60,posControl->y-100,40,20,5);
ofRectRounded(posControl->x+330,posControl->y-100,40,20,5);
//--front wind Shield
ofSetColor(230, 255, 255);
ofBeginShape();
    ofVertex(posControl->x+350,posControl->y-210);
    ofVertex(posControl->x+310,posControl->y-280);
    ofVertex(posControl->x+130,posControl->y-280);
    ofVertex(posControl->x+92,posControl->y-210);
ofEndShape();
//---front hood
ofNoFill();
ofSetColor(0,0,0);
ofBeginShape();
    ofVertex(posControl->x+350,posControl->y-200);
    ofVertex(posControl->x+92,posControl->y-200);
    ofVertex(posControl->x+50,posControl->y-170);
    ofVertex(posControl->x+380,posControl->y-170);
    ofVertex(posControl->x+350,posControl->y-200);
ofEndShape();

}

void ofApp::frontCar(ofPath tempPath){

    tempPath.setFillColors(carColor);
    tempPath.setStrokeColors(carColor);
    tempPath.setStrokeWidth(2.5);
    tempPath.setArcResolution(200);
    tempPath.moveTo(posControl->x+400,posControl->y-50);
    tempPath.lineTo(posControl->x+400,posControl->y-150);
    ofPoint pt1,pt2,pt3;
    pt1.set(posControl->x+400,posControl->y-150);
    pt2.set(posControl->x+405,posControl->y-190);
    pt3.set(posControl->x+360,posControl->y-210);
    tempPath.bezierTo(pt1,pt2,pt3);
    tempPath.moveTo(pt3);
    tempPath.lineTo(posControl->x+320,posControl->y-290);
    tempPath.lineTo(posControl->x+120,posControl->y-290);
    tempPath.lineTo(posControl->x+80,posControl->y-210);
    ofPoint pt4,pt5,pt6;
    pt4.set(posControl->x+80,posControl->y-210);
    pt5.set(posControl->x+45,posControl->y-190);
    pt6.set(posControl->x+40,posControl->y-150);
    tempPath.bezierTo(pt4,pt5,pt6);
    tempPath.lineTo(posControl->x+40,posControl->y-50);
    tempPath.lineTo(posControl->x+400,posControl->y-50);
    tempPath.moveTo(posControl->x+400,posControl->y-50);
    tempPath.close();
    tempPath.draw();
    frontDetails();
}

void ofApp::backDetails(){

    //----back bumper
    ofNoFill();
    ofSetColor(0,0,0);

```



```

ofSetLineWidth(2.5);
ofRectRounded(posControl->x+120,posControl->y-110,200,30,5);
//----back tires
ofSetColor(tireColor);
ofFill();
ofRectRounded(posControl->x+50,posControl->y-50,50,60,5);
ofRectRounded(posControl->x+345,posControl->y-50,50,60,5);
//----Back Lights
ofSetColor(255,0, 0);
ofEllipse(posControl->x+80,posControl->y-130,40,35);
ofEllipse(posControl->x+350,posControl->y-130,40,35);
//----Back Blinkers
ofSetColor(255, 128, 38);
ofRectRounded(posControl->x+60,posControl->y-100,40,20,5);
ofRectRounded(posControl->x+330,posControl->y-100,40,20,5);
//---back wind shield
ofSetColor(230, 255, 255);
ofBeginShape();
    ofVertex(posControl->x+350,posControl->y-210);
    ofVertex(posControl->x+310,posControl->y-280);
    ofVertex(posControl->x+130,posControl->y-280);
    ofVertex(posControl->x+92,posControl->y-210);
ofEndShape();
//back trunck
ofNoFill();
ofSetColor(0,0,0);
ofBeginShape();

    ofVertex(posControl->x+350,posControl->y-200);
    ofVertex(posControl->x+92,posControl->y-200);
    ofVertex(posControl->x+50,posControl->y-170);
    ofVertex(posControl->x+380,posControl->y-170);
    ofVertex(posControl->x+350,posControl->y-200);
ofEndShape();
ofBeginShape();
    ofVertex(posControl->x+330,posControl->y-170);
    ofVertex(posControl->x+310,posControl->y-120);
    ofVertex(posControl->x+120,posControl->y-120);
    ofVertex(posControl->x+90,posControl->y-170);
ofEndShape();
}

void ofApp::backCar(ofPath tempPath){

tempPath.setFill_color(carColor);
tempPath.setStroke_color(carColor);
tempPath.setStrokeWidth(2.5);
tempPath.setArcResolution(200);
tempPath.moveTo(posControl->x+400,posControl->y-50);
tempPath.lineTo(posControl->x+400,posControl->y-150);
ofPoint pt1,pt2,pt3;
pt1.set(posControl->x+400,posControl->y-150);
pt2.set(posControl->x+405,posControl->y-190);
pt3.set(posControl->x+360,posControl->y-210);
tempPath.bezierTo(pt1,pt2,pt3);
tempPath.moveTo(pt3);
tempPath.lineTo(posControl->x+320,posControl->y-290);
tempPath.lineTo(posControl->x+120,posControl->y-290);
tempPath.lineTo(posControl->x+80,posControl->y-210);
ofPoint pt4,pt5,pt6;
pt4.set(posControl->x+80,posControl->y-210);
pt5.set(posControl->x+45,posControl->y-190);
pt6.set(posControl->x+40,posControl->y-150);
tempPath.bezierTo(pt4,pt5,pt6);
tempPath.lineTo(posControl->x+40,posControl->y-50);
tempPath.lineTo(posControl->x+400,posControl->y-50);

```

```

tempPath.moveTo(posControl->x+400,posControl->y-50);
tempPath.close();
tempPath.draw();
backDetails();
}

//-----
void ofApp::setup(){

    startPos.set(300,450);
    ofSetWindowTitle("Pimp my Ride by Hussein El-Souri");
    //---
    viewGui.setup("Control");
    viewGui.setPosition(900,10);
    viewGui.add(sideView.setup("Side View",false));
    viewGui.add(frontView.setup("Front View",false));
    viewGui.add(backView.setup("Back View",false));
    viewGui.add(songPlay.setup("Pause Song",false));
    viewGui.add(posControl.setup("Position Control",startPos,ofVec2f(210,160),ofVec2f(700,800)));
    viewGui.add(tireColor.setup("Tire Color",ofColor(0,0,0),ofColor(0,0),ofColor(255,255)));
    viewGui.add(carColor.setup("Car Color",ofColor(57, 115, 172),ofColor(0,0),ofColor(255,255)));
    //---
    mySong.loadSound("song.mp3");
    mySong.play();
}

//-----
void ofApp::update(){

}

//-----
void ofApp::draw(){
    viewGui.draw();
    if(songPlay)
    {
        mySong.setPaused(songPlay);
    }
    else
    {
        mySong.setPaused(songPlay);
    }
    if(sideView)
    {
        frontView=false;
        backView=false;
        sideCar(sidePath);
    }
    if(frontView)
    {
        sideView=false;
        backView=false;
        frontCar(frontPath);
    }
    if(backView)
    {
        frontView=false;
        sideView=false;
        backCar(backPath);
    }
}

```

---