**Project Proposal Form**

**Team Name: The 186 Supreme Dream Team All-Stars**

**Members: David Boschwitz, Ryan Wendell, Omar Taylor**

**Section: D**

Please use the following pages to give us an idea of what you would like to work on this semester. Be descriptive as possible – we would hate to turn down an awesome project or give you too hard of one because we didn’t understand it!

To give the TAs time to review, please submit before Friday (1/30) at 11:59 PM. Projects approvals or rejections will be given in the following lab.

Example of a ***bad*** proposal:

Project Description – we want to do something with the Kinect. Either a game or a motion tracker. We won’t need any external libraries and we will write in Java.

*What is the project? How will you interface with the Kinect without its developer packages? How will you write this in a language the Kinect doesn’t support? This needs to be longer and more concrete.*

Difficulties – None

*Every project has difficulties be it a new language, new system, etc. If there are truly no difficulties, this project is too easy.*

Outcomes – This is going to make us better programmers and we want to use the Kinect because we think it’s neato burrito.

*How is this going to make you better? What sort of skills are you going to gain? What about the Kinect is enticing?*

Member Roles – Harold is going to make the UI, Fred is going to write the motion tracking, Susan is going to write the OS that will run the application, and Bob will help out where he’s needed.

*Make this a bulleted list!! This workload is unbalanced, Bob has no defined role.*

**Project Option #1**

2-Dimensional Platformer in 3-Dimensional World

Project Description: There will be little to no hardware required besides a computer capable of rendering 3-dimensional objects and an optional controller besides a keyboard. We will be coding in C++ or C.O.F.F.E.E. in order to have our 3D modeling suite, Cinema 4D, Cooperate with us. Cinema 4D includes the required libraries and dependencies to work with our project.

Difficulties: Some difficulties in this project will be modeling in 3D, along with making a game from it. C++ & C.O.F.F.E.E. is similar enough to C that there will be no difficulties in creating a project, but it is different enough that there is new things to learn.

Outcomes: We will learn how to create a 3-Dimensional video-game using 3D modeling systems and C++. Creating something of this magnitude is something that no one in the group is accustomed to so we will also learn how to create a large scale project.

Member Roles:

1. Omar: Majority of 3D modeling
2. Ryan: Integrating modeling into game
3. David: Developing logic/physics of our platformer

**Project Option #2**

Raspberry Pi Repeater

Project Description: *Create a repeater network using a network of Voice-Over-IP connected Raspberry Pi computers hooked into small 5W transistor radios. This would allow long-range communications where normal two-way radios would not be able to reach without using cell phones. You would set up a repeater in one area (ie Iowa State) where it would receive all two-way radio transmissions on a specific channel and then it would be transmitted to all the repeaters on the VOIP network which would transmit the message out of the connected two-way radio.*

*The hardware would include:*

*• Raspberry pi computer(s)*

*• BaoFeng BF-888s Two-Way Radios*

*• Any soundcards that may be needed to connect the radio and raspberry pi*

*(David already has all of this hardware)*

*Because the raspberry pi is a computer we could code in any language we wanted to, although it would probably work best in either C or Java. If we had enough time we would probably have to make a web admin panel that would allow a user to connect to it and change settings without physical access to the repeater.*

Difficulties: *The actual connection of the radio to the raspberry pi, you would need to know how the radio works and where to connect the specific elements of the radio to certain parts. The VOIP network would also be nearly impossible to create on our own but we may be able to use an open-source VOIP network we might find if we researched it.*

Outcomes: *This project would teach us about networking and connecting computers as well as how to make an electronic device that normally would not interact with a computer to interact with a computer. This project is a real-life work project that gives a low cost solution (all hardware for one repeater costs less than $100) for a large scale problem (connecting a large network of radio communication)*

Member Roles:

1. *Work on the hardware connections between the radio and computer and see what would be possible.*
2. *Create on the actual code and functions that would run the VOIP and controller system*
3. *Create a web interface/admin panel for changing settings on the repeater (main goal would be to help #2 as needed)*

**Project Option #3**

Targeting Drone

Project Description: *There are many drone products on the market each with their own unique features. Many drone products are designed to be flown with a remote control while others, such as Soloshot, are stationary cameras that follow all your motions. This targeting drone however takes the best of both worlds and will both soar to the skies and target whoever or whatever the user wants it follow via a receiver located on the targeted object. It will be programmed using either C, C++, Java. The hardware associated with the project will include parts for the drone, a camera, a gimbal (camera stabilizer), and a target receiver (i.e. electronic wristband).*

Difficulties: *If necessary, building the drone itself and having it fly properly may prove to be tedious for Computer Engineers without manufacturing experience, and this isn’t even the main task of the project. If we are merely modifying a drone, developing the code for the drone so that it tracks the receiver without complications, such as being able to dodge obstacles on its own, will be the next biggest hurdle.*

Outcomes: *If manufacturing is involved, we will have effectively gotten a crash course on how to develop flying objects, gained experience in motion tracking, and have further developed our problem solving skills. I am interested in every single aspect of the project, but between developing the drone (if we do that) and programming it to track the receiver, I am most interested having it successfully respond to the receiver. The idea is a relatively simple of one with a lot of user outreach potential.*

Member Roles: *What is each person going to work on?*

* Construct/buy/borrow the drone
* Write code for the drone to perform its basic flying functions
* Write code for drone’s advanced flying functions (collision protection, auto pilot)
* Write code for the drone to track receiver.