Sections 1,2,3,6 in requirements document

* 1. Project Overview

The purpose of this project is to provide the client with an autonomous solution for a pool playing partner. The robot will utilize Visual Recognition (VR) (need to define this) to make its own decisions regarding its shot selection and will play the game similar to how a regular opponent will.

* 1. Project Perspective
     1. System Interfaces (TODO for eric)
     2. Hardware Interfaces

The user will have the ability to interface with the system using hardware either through buttons, sensors or any other hardware solutions. This functionality will allow the user to give the robot trivial commands relating to the status of the game.

* + 1. Software Interfaces (TODO for eric)
    2. Communications Interfaces

1. From VR to PC

The communication between the VR and the PC will require the system to output the image takes by the VR to the PC for further computation.

1. From PC to microcontroller (uC) (need to define this)

This method of communications defines the method of transferring information from the heavy computational device (PC) to the microcontroller that will control the hardware.

* + 1. Memory Constraints

The PC not be very limited by memory since it should be well equipped with sizeable ROM (needs to be defined?). The limitations of the PC will arise from its RAM memory which may cause the computations to take time.

The microcontroller is more heavily constraint in its memory since most uC use chip memory that is general in the order of Kilobytes.

3.1 Mandated Constraints

* 750 dollar investment limit
* System will be customized for specific table
* Must create a functional prototype
* No motion further than 2ft away from table (in the plane of the table)
* No motion/components further than 4ft above the surface of the table
* Speed cannot reach dangerous speed
* The robot should not be required to break (define this) the balls
* Provide documentation for all requirements, design and testing component
* Must operate with user safety taken to consideration
* The group project will prepare a presentation to display the robots functionality
* The group will be required to complete the entirety of this project by the end of the academic year (April 2017)

3.2 Scope of the project

The scope of the project includes only the components of pool that require the player to attempt and take a shot.

3.2.2 Scope of the work (could be removed)

3.3 Scope of the product (could be removed)

3.4 Relevant Facts and Assumptions

|  |  |
| --- | --- |
| Facts | Assumptions |
| * Measurements and Physical Properties | * Table is uniform and flat * Balls are uniform and round * No mid shot interference * Balls never lift off table |

6 Project Issues

The issues to be addressed may consider marketability, competition, safety, liabilities or any other noticeable threats

6.1 Off-the-Shelf Solutions (how about “Existing Products/Solutions”)

Most existing solutions are non-commercial and are therefore not offered to the public. Nevertheless, these projects may affect the clients’ view of the product and the overall marketability of the product that this document describes.

6.2 Risks

The risks found in this project generally describe the safety considerations found with both the creation and operation of the product. This robot may have quite strong motor and actuators that may be high current/ high voltage devices. It is imperative that the user’s safety is taken into account and that even a player without any electrical experience will be able to at least be around the table.

6.3 User Documentation & Training

In order to market the product the user will need to be provided with documentation regarding the operation, safety and maintenance. Though the group should aim to create a product that provides the user with easy use there must be some form of training involved before the user can comfortably use the product. This may be include simple instructions, videos or formal training.

For the purposes of this product the team members will be required to operate the robot since they must have the highest level of training and have attained the most experience using the device.