Legal and Regulatory Analysis

Year: \_\_22\_\_ Semester: \_\_FA\_\_\_\_ Team: \_\_12\_ Project:\_\_\_\_RACHEL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Creation Date: ­\_\_\_\_\_\_10/29/22\_\_\_\_\_\_\_ Last Modified: October 29, 2022

Author: \_\_\_\_\_\_\_\_\_James Hubbard\_\_\_\_\_\_\_\_\_\_ Email: \_\_\_\_hubbar31@purdue.edu\_\_\_\_\_

Assignment Evaluation:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **Score (0-5)** | **Weight** | **Points** | **Notes** |
| **Assignment-Specific Items** | | | | |
| **Regulatory Analysis** |  | x3 |  |  |
| **Analysis of Patent 1** |  | x3 |  |  |
| **Analysis of Patent 2** |  | x3 |  |  |
| **Analysis of Patent 3** |  | x3 |  |  |
| **Writing-Specific Items** | | | | |
| **Spelling and Grammar** |  | x2 |  |  |
| **Formatting and Citations** |  | x1 |  |  |
| **Figures and Graphs** |  | x2 |  |  |
| **Technical Writing Style** |  | x3 |  |  |
| **Total Score** |  | | |  |

5: Excellent 4: Good 3: Acceptable 2: Poor 1: Very Poor 0: Not attempted

Comments:

*Comments from the grader will be inserted here.*

1.0 Regulatory Analysis

Our project, because it operates at a clock speed of 48MHz in the microcontroller, and several GHz in the laptop, is an unintentional radiatior of radio noise. According to the FCC, the threshold for becoming a “digital device” is a clock speed of 9kHz. Because of this, it will be necessary to meet the FCC standard for unintentional radiators. Our device is designed with home use in mind, therefore it is a Class B digital device [4].

Class B digital devices have strict standards, because they are designed to be used in residential areas where an abundance of radio, TV, WiFi, Bluetooth, etc. receivers and transmitters can be found and potentially interfered with [4]. It is for that reason that the standards for Class B devices have been designed to limit potentially harmful interference to a radius of ten meters [4]. This limit is chosen so that it doesn’t affect other devices around the user, like a neighbor’s television. It isn’t intended to prevent interference within a close range, because those problems can generally be solved by the end user [4].

To make our device compliant with FCC regulations, it may be necessary to make a plethora of design changes. For instance, it may be prudent to shield all the cables running out of our device, as well as redesign the packaging to be made from a conductive material, and surround the entire PCB. Many of the components of our product are consumer-grade devices which are already approved for sale, which means that the process of verifying our design for compliance would primarily be focused on the PCB containing our microcontroller and analog filters.

2.0 Legal Liability Analysis

**2.1 Game table television and projector system:**

**Filed:** Nov. 14, 2006

**Synopsis:** Game tables take up a lot of space in a room, and can only be utilized for a small proportion of the time. Existing solutions for converting one game table to another (e.g. a tabletop to convert a pool table to a table tennis table) allow the user to make slightly more effective use of their space, but the table still remains unused most of the time. Adding a television to the playing surface may allow the table to be used more often, or provide additional entertainment while playing the game for which the table is designed. For example, in a poolhall, there are often many TVs for guests to watch while playing. By integrating the television into the playing surface, it becomes easier to watch both the game being played and a television program simultaneously.

**Liability:** This patent makes several claims which overlap with our team’s project, namely a “table game” with a “television system” for ‘displaying moving images on the surface”. With that being said, the patent specifies that the images displayed on the table are “not associated with the … table game”. The images that our team intends to display to the table are related to the game, so our project does not infringe on this patent.

**2.2 Method for acquiring ball-hitting gesture and ball-hitting speed of table tennis robot racket:**

**Filed:** May 25, 2011

**Synopsis:** To accurately predict the trajectory of a table tennis ball at the time of being struck by a robotic paddle, a system of nonlinear equations is derived in this patent. The equations take as inputs the paddle orientation, entrance velocity, and exit velocity.

**Liability:** This patent describes a superficially similar function to the camera-based ball tracking implemented in our project. The method describes differs quite substantially from ours, as our project merely finds the ball in each frame of a video stream, as opposed to predicting the trajectory as soon as the ball is hit. Furthermore, this is a Chinese patent, meaning the likelihood of being involved in a dispute over this patent is low.

**2.3 Entertainment system providing dynamically augmented game surfaces for interactive fun and learning:**

**Filed:** Aug. 31, 2009

**Synopsis:** This patent describes a system for projecting images onto the playing surface of a game, which would be augmented by real-time tracking data of objects on the playing surface. A figure from the patent [3] is shown below.

Diagram

Description automatically generated

**Liability:** This patent describes our team’s project almost exactly. The architecture of the described device, namely a central controller taking in tracking data from a camera, and using it to modify images being projected onto the playing surface, is mirrored exactly in our team’s project, performing the exact same purpose. This means that our project would be “literally infringing” on this patent until the expiration date: Jan 13, 2031.

3.0 Sources Cited:

[1] “US10124240B2 - Game Table Television and Projector System, and Method for Same.” Google Patents. <https://patents.google.com/patent/US10124240B2/en> (retrieved 10/29/2022 )

[2] “CN102200760A - Method for Acquiring Ball-Hitting Gesture and Ball-Hitting Speed of Ping-Pong Robot Racket.” Google Patents. <https://patents.google.com/patent/CN102200760A/en> (retrieved 10/29/2022)

[3] “US8292733B2 - Entertainment System Providing Dynamically Augmented Game Surfaces for Interactive Fun and Learning.” Google Patents. <https://patents.google.com/patent/US8292733B2/en> (retrieved 10/29/2022)

[4] FCC (2014). Understanding the FCC Regulations for Computers and Other Digital Devices. <https://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet62/oet62rev.pdf> (retrieved 10/29/2022)