Final Project Proposal

Year: 2019 Semester: Fall Team: 10Project: Gesture Controlled Remote for Smart Home

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Team Members (#1 is Team Leader):

**Member 1: Wan Hsuan Lo Email: lo51@purdue.edu**

**Member 2: Timothy Yu-Jay Huang Email: huang983@purdue.edu**

**Member 3: Tsung Lin Hsia Email: thsia@purdue.edu**

**Member 4: Xi Wu Email: wu999@purdue.edu**

1.0 Project Description:

Gesture controlled remote for Smart Home is a device that responds accordingly to gestures such as swiping in different directions and hovering over the device. By showing certain gestures, the user is able to switch between different smart home devices and adjust the corresponding device’s settings. Meanwhile a display is available to the user for checking the remote status.

Depending on the smart home device the remote is connected to and the gestures used, the user could achieve different things. For speakers, the user could pause/start music, adjust volume, skip songs, and fast forward; for smart home lighting, the user could dim or brighten the lights.

2.0 Roles and Responsibilities:

Wan Hsuan Lo has significant experience in leading group projects in her academic career. She also has experience in both hardware and software design, including digital and analog circuit design, knowledge of semiconductor, and coding experience in many languages. Therefore, she is well-qualified to coordinate people with different skills.

Tsung Lin Hsia has had experience with system design and software integration during EPICS and internship projects at Purdue and Synopsis S.A. He also integrated the software on his ECE362 junior design team.Thus, Tsung Lin is best suited to be the system engineer for the team, responsible for high level functional overview of the system.

Xi Wu has had many experiences with hardware design. She worked on designing, manufacturing and assembling multiple PCBs interfacing with different sensors and adaptors during past internships. During her junior year, she was in charge of the IEEE ROV team’s embedded electronics group as the project group leader, in which role she was able to help design and debug circuits. Therefore Xi is the best candidate for the team’s hardware engineer.

Timothy Huang has plenty of experiences in software engineering. In his latest internship, he worked as a full-stack developer. He was on the computer vision team working on a deep learning people counter in the past two months. His work included both backend and frontend, from data training to UI/UX development. Therefore, we think Timothy is our best candidate for software engineer.

2.1 Homework Assignment Responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| *Design Component Homework* | | *Professional Component Homework* | |
| 3-Software Overview | TLH | 9-Legal Analysis | TH |
| 5-Electrical Overview | XW | 10-Reliability and Safety Analysis | TLH |
| 7-Mechanical Overview | WHL | 11-Ethical/Environmental Analysis | WHL |
| 8-Software Formalization | TH | 12-User Manual | XW |

3.0 Estimated Budget

|  |  |  |
| --- | --- | --- |
| **Mechanical Estimated Cost** | Remote frame | $10.00 |
| **Electrical Estimated Cost** | Project circuit board | $100.00 |
| Electrical components (gesture sensor[1],microcontroller, etc) | $50.00 |
| Misc. electronics | $40.00 |
| **Other Estimated Cost** | Estimated Shipping costs | $100.00 |
| Smart home device for testing | $30.00 |
| **Total Budget** | | $300.00 |

**Mechanical Estimated Cost**

Remote frame $10.00

**Electrical**

Project circuit board $100.00

Electrical components (gesture sensor[1], programming chip, etc) $50.00

Misc. cables $40.00

**Other**

Estimated Shipping costs $100.00

Smart home device for testing $30.00

**Total Budget** $300.00

4.0 Project Specific Success Criteria

*The following project specific success criteria are proposed for the motion controlled remote for smart home:*

1. *An ability to receive and interpret I2C data from the gesture sensor to the microcontroller (HW)*
2. *An ability to generate instructions for the device depending on the data received from the gesture sensor (SW)*
3. *An ability to update the status of the device on the LCD display (HW)*
4. *An ability to use the wifi module to establish a wireless connection between the device and the smart home device (HW)*
5. *An ability to monitor and display the battery usage status to the user (HW)*

5.0 Sources Cited:

[1]Digi-Key Electronics.(2019) Electronic components: sensor. Available: <https://www.digikey.com/products/en?WT.z_cid=sp_516_buynow&keywords=APDS-9960>