Formal Review

for

Hug the Rail IoT

Version 1.0

Prepared by Zac Schuh

Stevens Institute of Technology

May 11, 2021

Time of FTR: 8:40PM 5/9/21

Participants: Grace Mattern (Reviewer), Christian Szablewski-Paz (Producer), Tristan Kensinger (Recorder), Zac Schuh (Review Leader)

Initial Goals

Our initial goals when starting out largely revolved around the creation of a safe product. Our main goal was to create an embedded system with sensors not reliant on any connection to the internet or a network. With the combination of these, we aimed to create an easy-to-use product with a focus on safety, while ensuring the GUI would be simple to understand and operate. While setting our goals we understood that there would be features that ended up being either too time consuming or difficult to implement. With this in mind, however, we still tried to set realistic expectations and strived to successfully implement every feature we had planned. Nothing was too ambitious, although there were features, such as the weather sensor, that ended up being too complicated to add.

Changing Goals

Throughout the course of the development process many of our goals changed drastically. Some extraneous features, like the aforementioned weather sensor, had to be eliminated since they provided very little to the effectiveness of the product while requiring a rather time consuming process. While doing this, we also added the horn feature, which allowed for a more safe environment for the product; this was in line with our initial goals and proved to be a worthwhile time investment. In addition, we added the obstruction, slippage, and gate features for a similar reason, although the extra information these features provided allowed for an easier product to use, as well. One of our biggest issues throughout the development process was defining our requirements. This proved to be an issue early on, as well as around the midpoint of the process. While they were technical issues as well with the IDE and our requirements, these issues were easily surmountable. A problem that we quickly solved was our struggle to choose the architecture for the product. We eventually decided on an architecture that would be easy to use and understand, instead of one that would be the most visually appealing.

Issues Throughout the Process

By the end of the process, almost every feature we had planned ended up working correctly. While we had to cut out the weather sensors, all the remaining aspects of the product functioned successfully with little modification. What surprised us the most was the sheer amount of writing text compared to the very low emphasis on coding. There was far less programming than we initially planned for, which made for a very ineffective planning process. We did not entirely understand the scope of what we would be working with throughout the process, which meant that we could not plan our work in a timely manner, either. The product's GUI was not visually appealing and could certainly have been implemented further with more detail and polish. Given slightly more time, the weather sensors likely could have been implemented with little difficulty. If we were to go through this process again, we would have a far more efficient system for creating diagrams. While we used a template in google drawings, the template was not shared and we wasted lots of time recreating the same diagrams repeatedly. If we had more foresight and a better understanding of what the process would entail, we would have spent far more time on the planning process.

Vote

Upon voting to accept the product, we determined with a vote of 4-0 that we accept this product without modification.

Grace met with our coach, Akhilesh Reddy, on 5/10/21 at 3:05PM.
He looked and reviewed our product and was satisfied with it without modification.