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Software Development of SmartSealz Functional Prototype

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*Abstract*—

INTRODUCTION

T

he use of warning in the aviation environment is a not a new idea but the style at which these errors are provided has recently become an important question. This question has been looked at by the SmartSealz Development team over the course of four Senior Design teams. The goal of the project has remained constant through each of the iterations. This ultimate goal of “improving operational safety in flight” [Cite youtube video] has driven the project from its original idea to the current version of prototype that is functional and constantly under development and improvement.

In the beginning of the project there was a heavy focus on Electrical Engineering skill sets that lead to the initial proof of concept prototype. This initial prototype provided information about the possibility of providing tactile feedback to a pilot through vibration actuators in an aviation headset. After the initial proof of concept was created the next iteration brought on a Software Engineer to help in the development and in the course of seven months the original prototype was transformed into a working touch screen user interface with ability to connect navigational data from a second, complimentary device that will be explained later in the paper, a primitive physiological analyzer that will be described later in the paper, and the navigational data from an integrated circuit board described later in the paper.

Over the course of the most recent integration of the development team there has been improvements on the principle software that drives the user interface that will be described later in the paper, there has been work in creating a physiological connection that is described in the original Patton proposal [Cite Patton proposal], as well as possible connection to the aircraft to use data provided by the onboard avionics. These goals for the current iteration as well as the plan to achieve these goals will also be outlined later in the paper.

Software Development

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ver the course of the first portion of the current iteration of development there has been work to increase the level of multi-processing within the different processes. The goal of increasing multi-processing is to increase the response time of the user interface device that is directly manipulated by the user as well as to increase the refresh rate on the principle data collections. In data collections done from the original software version with no multi-processing ability was compared to the data from the current multi-process heavy program. Data file reading, background processes start and stop, and Boolean checking functions have been edited to be multi-processing functions so in Figure 1.1 the tables show the spread of memory usage from startup to stop on a five-minute test. The control data is the non-multi-process version with light usage. The comparison was taken on specific fields that would cause response time slowdown including {Add Areas of data checked}.

Alongside increasing the multi-processing, inside the multiple project files there is a combination of {Add number of languages used} used in the project

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