Winter 2015-2016

Team Number ECE-BCC-4

Paintball Environment Tactical Engagement Recon System (P.E.T.E.R.S.)

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1. Abstract

The game of paintball has existed in one form or another for roughly the last 30 years, and in that time it has grown from a small group of friends engaging in archaic, backyard games to a full-fledged multi-million dollar-a-year industry. As a result, many great technological strides have been made in terms of improving the paintball marker, playing field, and peripheral development, but the tactics employed on the simulated battlefield and the derived annoyances that accompany them have remained largely unchanged over the years. For any seasoned paintball enthusiast, it is no secret that checking paint levels, pressurized air levels, and determining the location of teammates all involve a large diversion of attention from the task at hand and can each, in their own ways, contribute to the loss of the game. Currently, however, there is simply no work-around for keeping one's attention totally dedicated to the game and its resulting, dynamic environment.

The *Paintball Environment Tactical Engagement Recon System* (P.E.T.E.R.S) aims to significantly lessen or totally remove these distractions by placing the required information in the peripheral vision of the user. By way of utilizing existing commercial-off-the-shelf (COTS) hardware and developing a system of network communication, this project aims to make available to the user information regarding paint level, remaining air pressure, and relative player locations in the form of a heads-up display (HUD) integrated into the paintball mask. In this way, the user can maintain a ready posture at all times in terms of directing the majority of attention to his/her surrounding environment and thereby being able to react far more readily to the bevy of situations encountered during a game.

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Objective

Develop a system to enhance situational awareness in the game of paintball. This system will utilize a Heads-Up Display (HUD) connected to various sensors to present useful information to the user. The sensor information will be recorded and processed through a Raspberry Pi.

Relative team member locations will be displayed on a representation of the playing field via the HUD. Locations will be updated at regular intervals. Sensor information will be used to indicate low air pressure and low paint levels for the user.

Paintball marker with pressure sensor

Recon Snow2 HUD

Approach:

Modify existing HUD to display required information by:

1. Obtaining necessary data from paintball marker.
2. Processing and networking data via Raspberry Pi
3. Developing Android app for HUD
4. Displaying necessary information on app

Key Milestones

- HUD GUI code complete 1/16
- Server storage code complete 1/16
- Hardware mount for hopper (prototype) complete 1/16
- Paintball level detection filtering methods complete 1/18
- Server data intake code complete 2/16
- Data processing code complete 2/16
- Wireless data transfer from sensor array to server complete 2/16