Semester 4 Design Review

Prepared by: Kevin Hartwig

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## Deficiencies in Design vs. Original Specification

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| **Platform Controller (operations on Embedded Target)** |  | **Status** | **Comments** |
| **Platform Communication** |  |  |  |
| Receives and responds to commands over an RS232 link | M |  | Complete |
| Communication protocol and commands documented | M |  | Complete |
| Asynchronous command processing  (respond to commands while platform or camera moving) | M |  | Complete |
| Useful status messages on LCD | C |  | Complete |
| Halt operations if communication with platform supervisor lost | C |  | Incomplete |
| Restart operations if communication with platform supervisor restored | C |  | Incomplete |
| **Platform Operation** |  |  |  |
| Homes pan/tilt mechanism at reset and/or on command | M |  | Complete |
| Tilt tilt mechanism forward and backwards to set points, stop at appropriate limits | M |  | Servo does not stop at appropriate limits |
| Pan pan mechanism left and right to set points, stop at appropriate limits | M |  | Complete |
| Simultaneous pan, tilt and DC motor speed control | M |  | Complete |
| DC motor bidirectional motion with variable speed control (each motor of two) | M |  | Control of speed is not in any measureable unit |
| DC motor closed-loop speed control | M |  | Incomplete |
|  |  |  |  |
| **Platform Supervisor (on Linux host)** |  | **Status** | **Comments** |
| **Platform Supervisor Operation** | | | |
| Sends commands and receives status information over an RS232 link | M |  | Does not receive status information from the target |
| Menu or text-entry based control of operations | M |  | Complete |
| Pings embedded target regularly and reports loss of communication | C |  | Incomplete |
| Graphical User Interface | C |  | Incomplete |
| **Optional Joystick interface** | | | |
| Detect joystick device | C |  | Incomplete |
| Read hat events and convert to camera motion commands | C |  | Incomplete |
| Read joystick position and translate to platform motion commands | C |  | Incomplete |
| Read "sound capture" switch and translate into fork or system call to do audio capture and processing | C |  | Incomplete |

## Deficiencies in Product Quality

Product quality will be affected for each deficiency in design as per the original specification. The foreseeable deficiencies are outlined below:

1. If communication with platform supervisor is lost, the target will continue to run (i.e., neither the platform nor supervisor will acknowledge the loss of communication).
   1. If the robot was carrying out an operation when communications are lost, the actions of the robot are no longer controllable. **This is a safety issue.**
   2. The user in control of the supervisor will not be aware if communications are lost.
      1. This would be a very frustrating scenario for the user.
      2. Features implemented in the future will be difficult to diagnose, as there will always exist the potential that a perceived bug is actually the result of lost communication.
2. If communication between the platform and the supervisor fail, the system is not automatically restarted. The user must identify that communication has gone down then manually restart the system. This is a major deficiency in user experience.
3. Tilt mechanism has no limits, and thus the user could unintentionally damage the servo motor by attempting to move it beyond its recommended range of motion.
4. DC Motor speed control is not in any measureable unit (i.e., currently the user can choose between speeds of 1, 2 and 3, which do not correlate to any specific units and are not linear). This will significantly degrade user experience.
5. DC Motor speed is not closed loop. This is a major deficiency in user experience as the user will have to manually account for any external forces which may deter the platform from reaching the desired set point.
6. Lack of graphical user interface (a command prompt interface is used instead) may affect user experience, depending on the user’s level of computer knowledge.