Using Technology to Measure Adherence of Complicated Medication Regimens

Progress Report 9

Client
Timothy Juergens, M.D.
UW/VA Hospitals
Geriatric psychiatrist/sleep specialist
Phone: 239-3030
timothy.juergens@med.va.gov

Advisor
Professor William L. Murphy Ph.D

Team Members
Sujan Bhaheetharan (Communications) sbhaheethara@wisc.edu
Cara Dunn (BSAC) cddunn@wisc.edu
Farshad Fahimi (BWIG) ffahimi@wisc.edu
Nipun Yamdagni (Leader) nyamdagni@wisc.edu

Problem Statement
According to a recent study, almost 75% of patients, especially the elderly, do not adhere to their medication regimens for various reasons. This lack of adherence can prevent a patient’s recovery. Additionally, the present state of affairs is such that if a patient reports no improvement, a physician does not definitively know whether to try a different medication or whether the patient is simply not taking the medication regularly. To improve general health of patients assigned complicated medication regimens, we are to make a device that keeps a record of when a patient takes their medication.

Summary of Team Accomplishments
• Formed team and assigned individual roles
• Met with client and obtained project supplies
• Formulated problem statement
• Brainstormed possible designs
• Compile team members’ parts of the PDS and edit
• Create project website
• Meet with Professor Morrow to discuss possible solutions
• Research processors
• Obtained a microcontroller and corresponding development kit
• Narrowing down designs and design specifics
• Figured out concept of a switch matrix
• Work on mid-semester presentation
• Research specifics about a switch matrix
• Research various switches that could be used

**Current Week’s Goals**

• Research
• Figure out details about how to use the micro-controller
• Continue research for more switches
• Build and test a sample circuit with the micro controller

**Project Schedule/Important Dates**

<table>
<thead>
<tr>
<th>Sep 08</th>
<th>Sep 15</th>
<th>Sep 22</th>
<th>Sep 29</th>
<th>Oct 06</th>
<th>Oct 13</th>
<th>Oct 20</th>
<th>Oct 27</th>
<th>Nov 03</th>
<th>Nov 10</th>
<th>Nov 17</th>
<th>Nov 24</th>
<th>Dec 01</th>
<th>Dec 08</th>
<th>Dec 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select a Project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client Meeting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literature Research</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rough Draft of PDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brainstorm designs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decide on Design Alts.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decide of Final Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work on Prototype</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poster Pres. (Dec 8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advisor Meeting (Dec 15)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***: Important
*: Urgent
****: Critical
Difficulties:
- Figuring out intricacies of programming the micro controller
  - How to use pins, other than P1.0 and P2.0, because we have access to and need, P1.1-P6.7.
  - How to create a new header file to incorporate additional functionalities

Activities

Sujan
- Notebook: 0.5 hr
- Digikey Research: 2 hrs
- Group Meeting: 2 hrs
- Communications: 0.5 hr
  Total: 3 hrs

Cara
- Pill Box Purchase: 1 hr
- C++ Review: 2 hrs
- Team Meeting: 2 hrs
  Total: 5 hrs

Farshad
- Digikey Research: 0.5 hr
- Meeting with Co-worker: 0.5 hr
- Group Meeting: 2 hrs
  Total: 3 hrs

Nipun
- Group Meeting: 2 hrs
- Finding CD: 1 hr
- Trying to program micro controller: 4 hrs
- Progress report: 0.25 hr
  Total: 7.25 hrs

Team Total Hours for this Week: 18.75 hrs
Cumulative Team Hours to Date: 155.5 hrs

Expenses:
- 2 Pill Boxes: $2.11