Project Specifications

Bluetooth Enabled Coffee Machine

ECE 4901 - Senior Design I

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Introduction and Overview

Traditional coffee machine designs are outdated and inefficient. As a result, the purpose of our project is to Bluetooth enable a coffee machine. This will allow for users to operate their coffee machine from the convenience of the next room, or another area in the vicinity.

This coffee machine will have many features that a regular coffee maker does not. Through Bluetooth enabling it, the user will be able to control various features from their smartphone or other handheld device. Some of these features include: commanding it brew on command, commanding it to brew at a specified time, selecting a flavor of coffee to dispense, and selecting a volume of coffee to dispense.

Technical Specifications

Hardware
- A keurig coffee maker
- AC, zero-cross solid state relay (Input 3-8V DC, Output 0-220V AC)
- Atmega328 Microcontroller (Operating Voltage 5-12V, Output 5V, 30mA)
- Broadcom bluetooth module (Operating Voltage 3.3V, Output 3.3V, 30mA)
- Temperature Sensor (Operating Voltage 1.5~5V, Range -50°C~150°C)
- Interface between bluetooth module and microcontroller via UART

Software
- An application on a smartphone
- Minimum Requirements: Basic UI layout with buttons to control the coffee machine
- Execution time(after connection): max 5 seconds

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
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<tbody>
<tr>
<td>Connect</td>
<td>Establishes a safe connection to coffee maker via bluetooth</td>
</tr>
<tr>
<td>Disconnect</td>
<td>Closes the connection.</td>
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<tr>
<td>Brew</td>
<td>Send control to brew coffee</td>
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<tr>
<td>Flavor</td>
<td>Choose a flavor for brewing</td>
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<tr>
<td>Volume</td>
<td>Select volume to dispense</td>
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<tr>
<td>Time</td>
<td>Set a time to brew coffee</td>
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<tr>
<td>Stop/Cancel</td>
<td>Stops current brewing</td>
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Operating Range
Temperature: Ideally Room temperature (25°C)
Range: 50-70 feet
Cost: ideally <$300