E-Sense

Physical Simulation of Low-Level Device Interaction

As contemporary computing develops, the user is abstracted from the beating heart of the computer itself. S-Ense, pronounced “essence”, is a project aimed to reproduce the feelings of interfacing directly with a machine that working professionals in technology driven fields sometimes experience for the layman user. The layman user can be described as any person who has not experienced a computer or similar device as an extension of themselves; who has not experienced a complete symbiosis with a device. Curiosity is a universal human trait, but it is notoriously difficult to develop a deep enough comfort level with a machine that it feels like an extension of your own mind. S-Ense is a project which is designed with the goal of distilling this experience between human and machine, providing an array of practical uses that may benefit its user throughout their day, and embracing a stylized user interface which challenges the user to speak to S-Ense and interpret its replies on the device’s terms.

The ability to understand how a machine operates is highly prized in our society. This skill can be taught with a reasonable rate of success, given the general progression of technology. However, a love for computing can only be inspired. The easier a computer becomes to use, the more their inner complexity and maximum potential as a creative tool are obfuscated. The ultimate goal of S-Ense is to provide a platform which encourages users to explore a machine on its own terms, using binary code in all of its commands and programs as input and output. This will provide a standing reminder of the roots of computing, and train the user to apply what they have begun to understand from S-Ense to the other devices of their daily lives.

The foremost goal of E-Sense is to inspire curiosity and delight for computing in a user. Because all details of the E-Sense project will be open-source, the user will be free to construct an S-Ense device for themselves, modifying what they see fit. This outlines the second goal of the S-Ense project: to provide an easy to use, modifiable, cost-effective platform for computing experimentation. S-Ense will be able to provide an interesting and inspiring experience in some way to user with any level of computing experience.

S-Ense will be developed on an Arduino Uno prototyping board with simple electronics readily available to the average consumer. For output, an S-Ense will utilize eight LED lights arranged in pairs of four different colors, and for input, two buttons to deliver eight bit commands. The Arduino Uno will be configured to reliably receive a binary command from its user, and then execute whichever selected program. Such programs may include reporting the current time or date, or activating a simple binary calculator. All code and project documentation will be freely available to the user, and will likely be posted as a Google Code project (code.google.com). The user will be provided with documentation on how to use the E-Sense device, including a detailed list of commands the E-Sense device can interpret.

Examples of E-Sense Commands/Programs

(Input is provided by user via two buttons labeled “0” and “1”, each command is interpreted as a byte)

(Output is displayed as a byte or a series of bytes to the user via the colored LED’s)

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| **Binary Command** | **Output Description** |
| 00000000 | Reset: Flash all LEDs 3 times  A neutral command to orient the device to receive a command (allows user to be certain that no prior key-presses are being interpreted).  \*If a command byte that does not exist is received by the device, nothing will happen |
| 00000001 | Calculator: Refer to character guide. Enter an operator (“+”: 00000001) and any two numbers. Values above 255 will be displayed across multiple bytes of output in units of 255 or lower. |
| 10101010 | Lock Device: Device will only accept a Reset command or Lock command (which unlocks the device an allows for normal input). |

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|  | Description of Work | Start and End Dates |
| Phase One | Explore input/output algorithms of Arduino Uno using C programming language | 11/28 – 12/11 |
| Phase Two | Finalize wiring layout and S-Ense command system | 12/11 – 12/18 |
| Phase Three | Create S-Ense commands and programs/Bug-fixes | 12/18 – 12/25 |
| Phase Four | Finalize device housing and presentation/Add commands and programs where possible | 12/25 - end |