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KnowSmart

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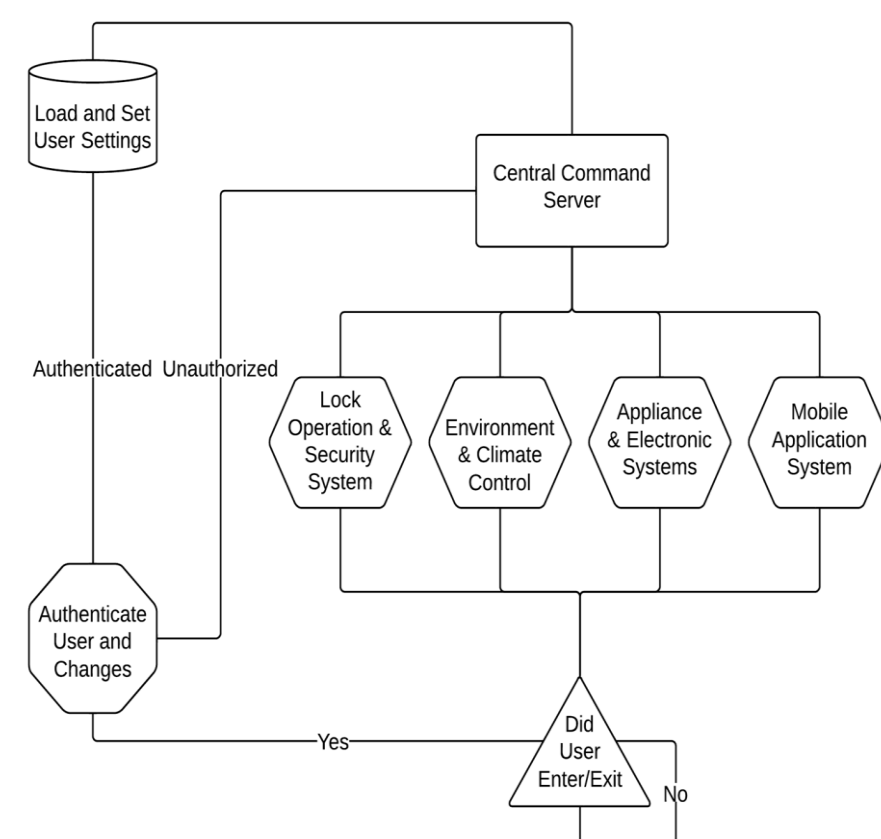
KnowSmart

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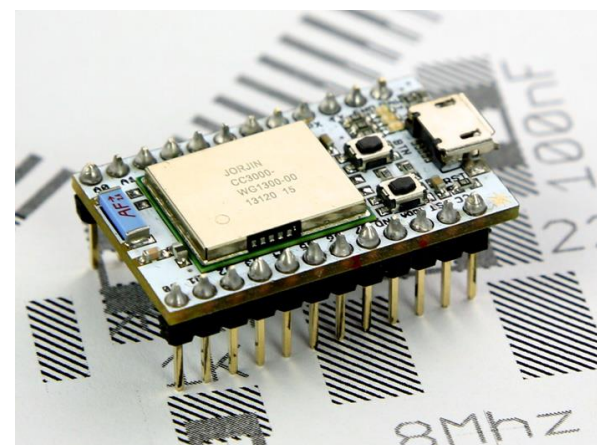
Abstract

KnowSmart is our team's innovative approach towards implementing smart house technology that is quickly emerging on today's market. Management of the home is done by a central command server. Multiple modules on devices around the house communicate with a central server. These modules are part of four distinct subsystems: the Lock System, the Climate Control System, the Smart Outlet System, and the Appliance Control System. The server and the modules communicate back and forth to authenticate a user. Once the user is authenticated, the preferences of the user(s) are loaded and set. Each individual module adjusts to the devices' settings accordingly. The central command server will then be updated with the status. Each individual module should be able to be applied to any house.



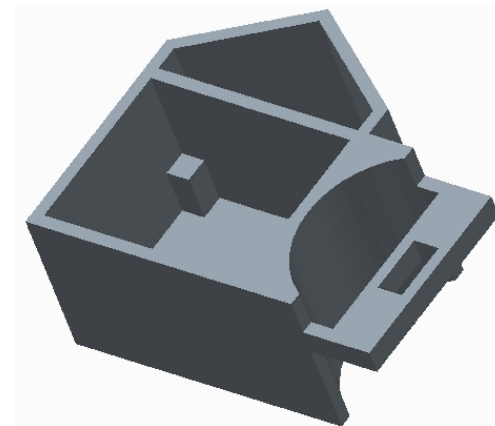
Spark Core

At the brains of all our modules is the Spark Core, an innovative approach to internet-connected hardware.



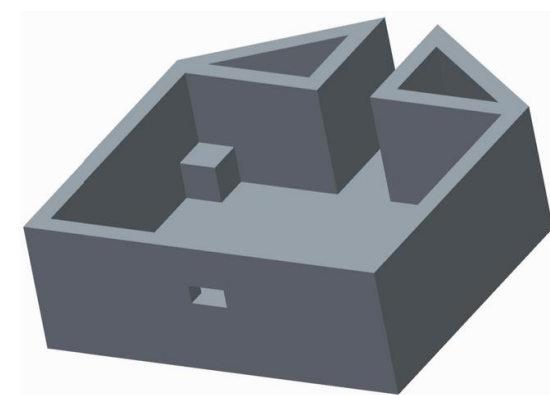
Lock System

This module is responsible for managing and tracking KnowSmart users, while maintaining the integrity of the home. This module has the ability to seamlessly grant access to registered users and allow registered users to grant guests access.



Television Control

This module acts as a smart remote for a television. The users have the ability to power on and off the television and set the channel and volume through the web and mobile application.



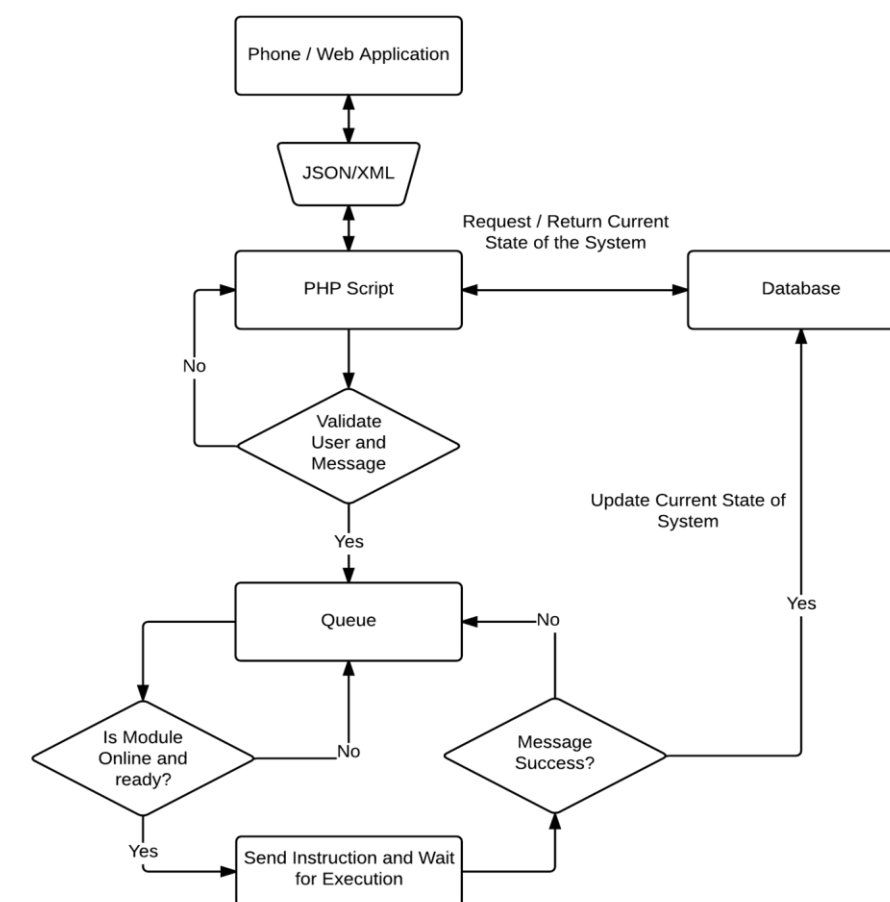
Smart Outlet

This module consists of a relay shield with four outlets. It has the ability to power on or off any appliance that is hooked up to it remotely through use of the mobile application or the web interface.



Central Command Server

The Central Command Server controls the various modules within a KnowSmart home. It communicates with the other systems sending messages back and forth with user preference data and current device settings.



```

mysql> SHOW TABLES;
+-----+
| Tables_in_localHome |
+-----+
| COMMAND              |
| MESSAGES              |
| SPARKDATA             |
| SPARKITEMS           |
| USERS                 |
+-----+
5 rows in set (0.00 sec)

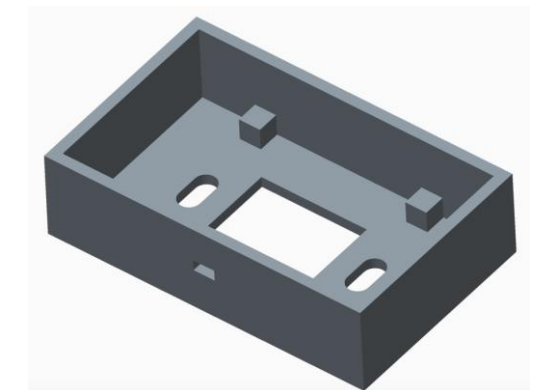
mysql> SELECT * FROM MESSAGES;
+-----+-----+-----+-----+-----+-----+
| itemID | deviceValue | time       | dayofweek | userSender | usersHome |
+-----+-----+-----+-----+-----+-----+
| 3      | relay,1000  | 14:20:00  | 2         | 1          | 1         |
| 3      | relay,0000  | 19:21:00  | 2         | 1          | 1         |
| 3      | relay,0000  | 14:18:00  | 3         | 1          | 1         |
| 3      | relay,0000  | 19:34:00  | 3         | 1          | 1         |
+-----+-----+-----+-----+-----+-----+
    
```

Artificial Intelligence

The Decision Tree Learning algorithm used by our AI makes decisions based on users' preferences, processes the information, and sends the corresponding information to the other subsystems.

Climate Control System

This module is composed of a smart thermostat that can read the current temperature and alter the temperature. It has the ability to analyze the users' preferences through the artificial intelligence and adjusts the climate throughout the house accordingly.

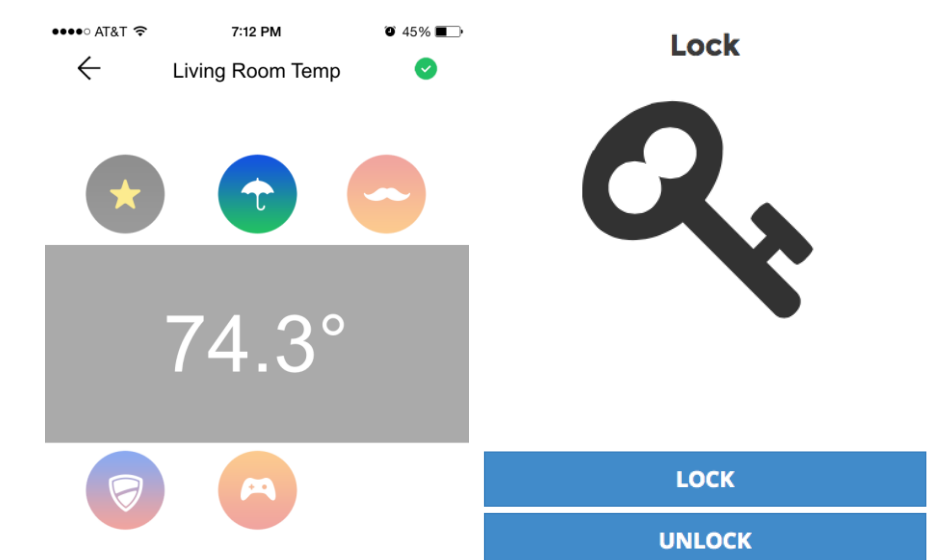


Washer/Dryer

The vibration of each cycle triggers sensors and monitors the status of each washer and dryer load.

Mobile/Web Application

The mobile and web applications provide users with a graphical representation of the status of the different modules. The applications also act as a control module for the house.



KnowSmart

NORTHROP GRUMMAN



Engineering & Science
Student Design Showcase
at Florida Institute of Technology

