

North Carolina A&T State University students utilize ThingWorx in senior design group projects to create smart home and parking lot applications



The ThingWorx platform has been a joy to work with. The quick start guides allow the students to get a sample project up and running their first session. I typically start them out with 5-30 minute guides the first week. Once viewing these guides, students are very adept at creating ThingWorx applications."

Dr. Christopher Doss,
North Carolina A&T State University



Diagram of Sensors in Smart Home.

PROJECT 1: SMART HOME SIMULATION

The project replicates common household smart devices to implement them in a smart house simulation.

Data can be sent from an external source to add things, add properties, and change values of said properties at the user's discretion. By using this feature with the simulated smart devices, the students are able to replicate how a smart house tracks a person's routines. The end goal is to monitor smart devices, tracking anomalies in a person's routine and initiating certain actions when such an anomaly is found.



Deriech Cummings accessing his application on ThingWorx.

PROJECT 2: SMART PARK

The purpose of this project is to use IoT to solve the issue of parking at North Carolina A&T University.

Students involved in the project decided to utilize IoT to construct a Space Monitoring Device (SMD) – which incorporates sonar sensors that can detect when a vehicle has entered the corresponding parking spot. This information is then transmitted via Wi-Fi to a centralized ThingWorx server and then displayed on an output monitor – a conventional tablet – which is placed at the entrance of the parking lot. They can also view vacant spots by downloading the app onto their Android device.



Smart Park Project Students.

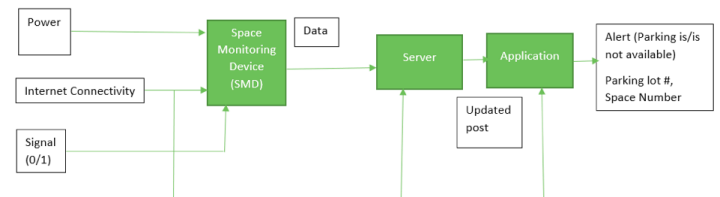
Each parking spot is equipped with a SMD to create a network of parking monitors which give real-time analysis of parking at the university.

Students, faculty and staff will use this system to make informed decisions when trying to find free parking spaces, which will save time and gas and decrease the levels of stress.

Level 0 Design



Level 1 Design



Block Diagram of Smart Park System

PROJECT 3: SMART HOME SECURITY SYSTEM

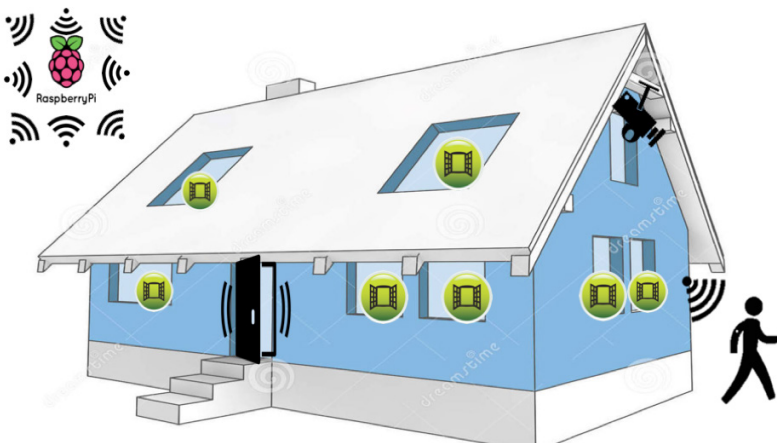
For the senior design project, the overall goal was to simulate an IoT home solution. In particular, a smart home security system.

By using sensors – primarily camera sensors – the student group wanted to make a functioning mini-surveillance system that could react dynamically to the environment based on data it receives.

For example, in a real smart home, a text could be sent to a phone when someone new enters the room. Events can either trigger something to happen on the main website hub, or can activate something within the room.

The students describe the value proposition of the smart security system is as follows:

"Whether you're 5,000 miles from home or running a quick errand, you can stay connected to home with smart security. That means convenience and peace of mind, no matter where you are. Even if there is an issue at home, it's easier to manage with a smart security system. You can get immediate notifications that can include images and video clips to show you what's going on."



Conceptual Representation of Smart Home Security System.



Rodney Ivey Accessing ThingWorx App on Phone while Javon Lee Accesses on Computer.



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