Christmas Lights Animation

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Sponsor: L3 Communications

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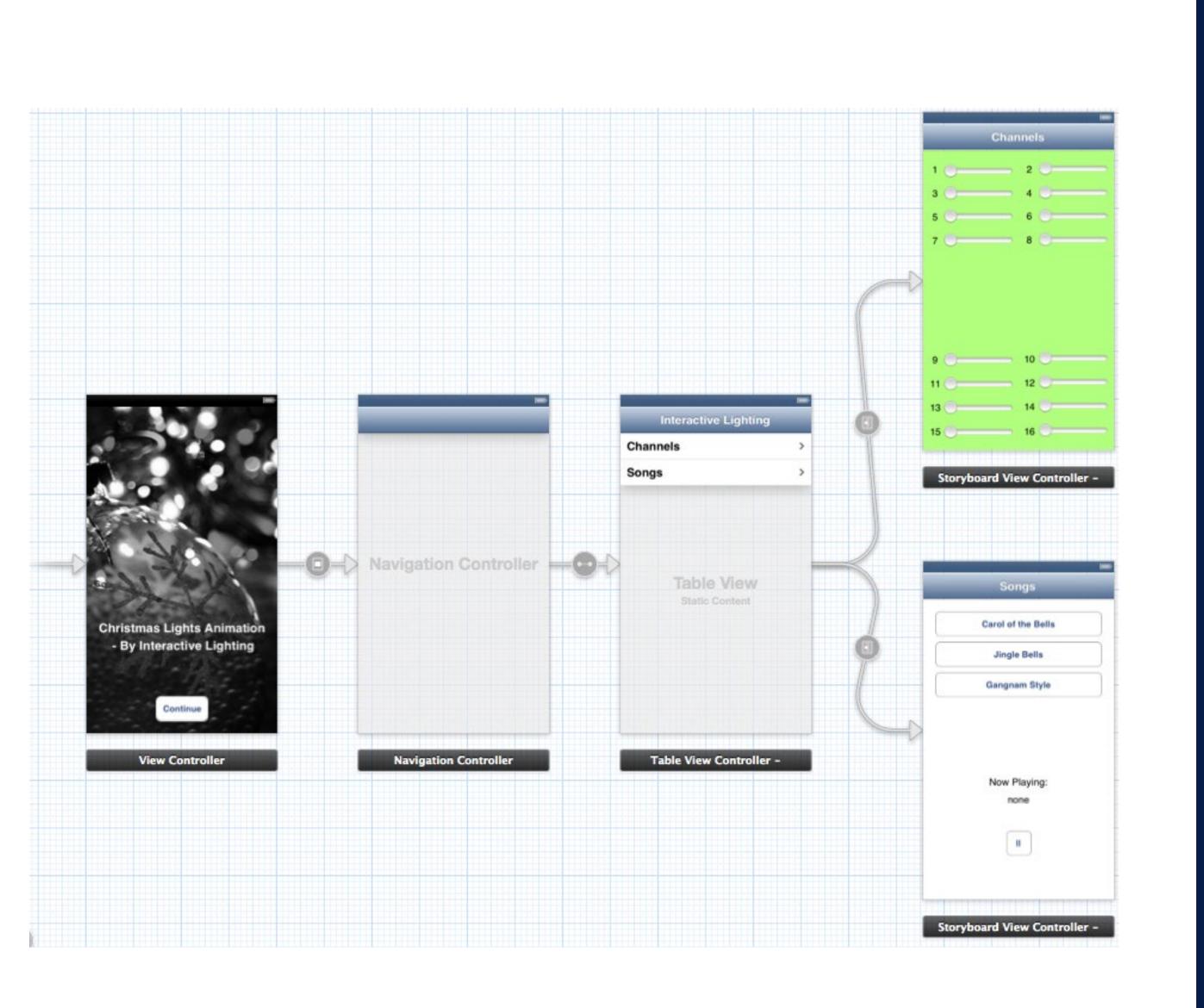
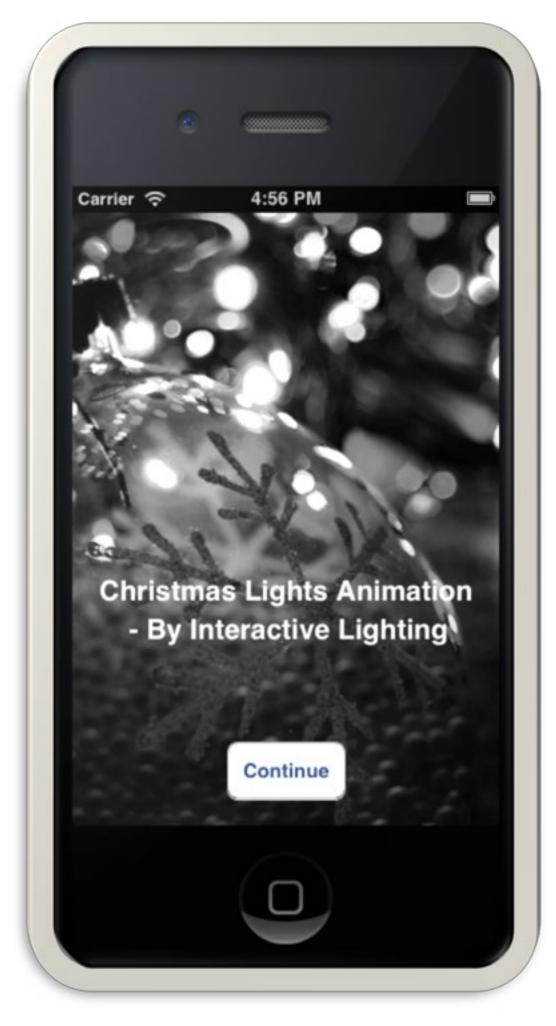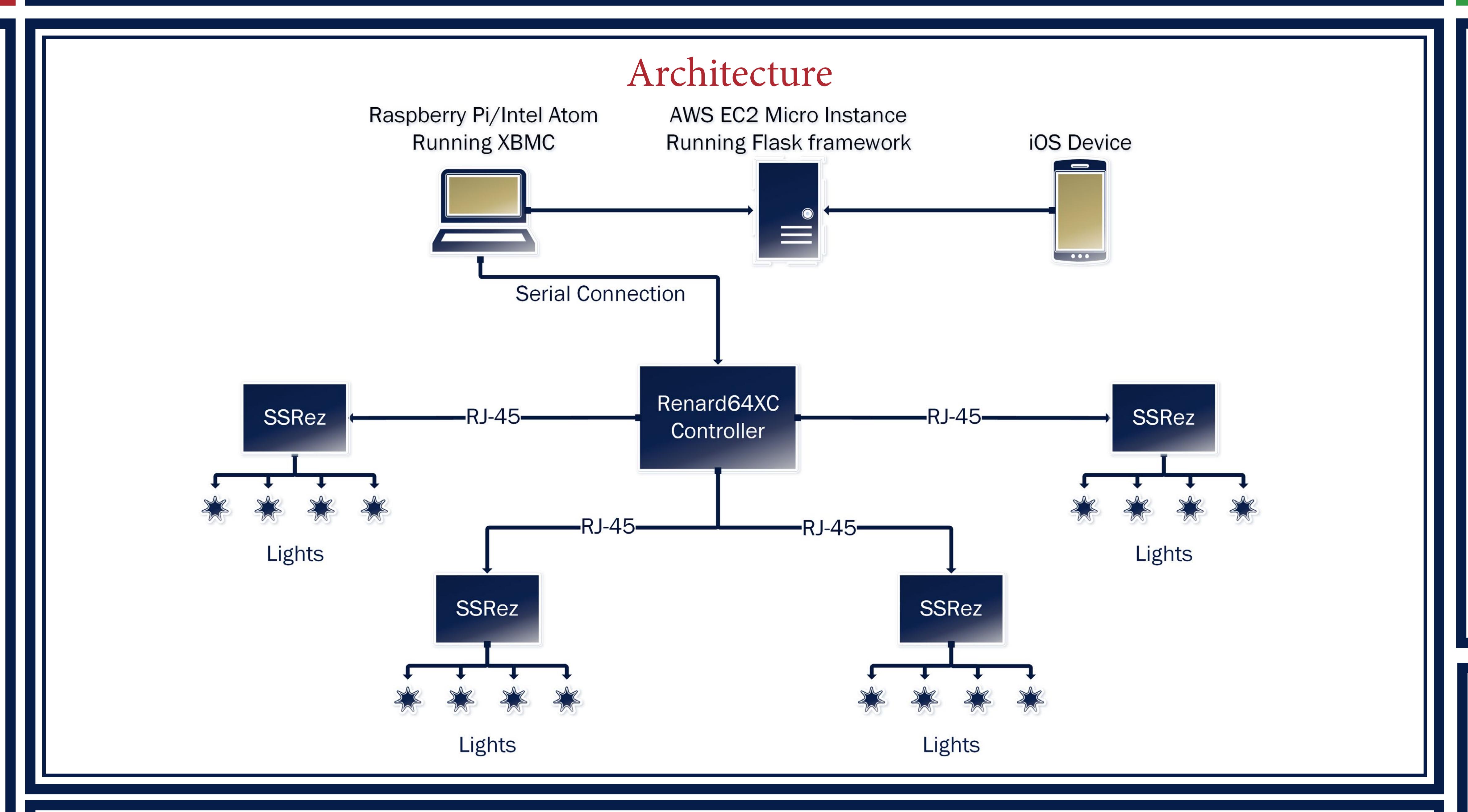SOUTH DAKOTA
SCHOOL OF MINES & TECHNOLOGY

Purpose

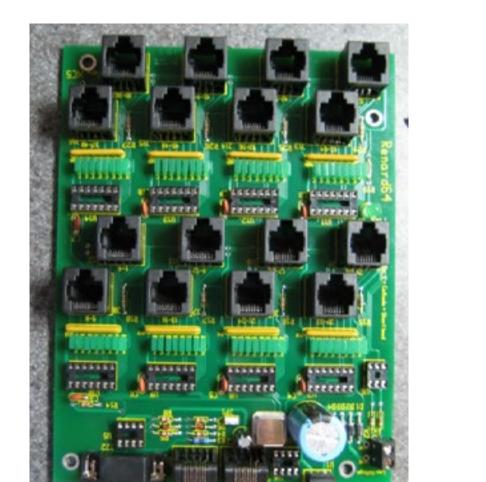Synchronize lights to music and allow control via smartphone.

iOS Application

- iPhone® app
- "Controls the system"
- Sends commands to the server
  - Play a song
  - Pause a song
  - Can change each channel's brightness
- Sends commands using JSON data format

Architecture

Raspberry Pi/Intel Atom Running XBMC

AWS EC2 Micro Instance Running Flask framework

iOS Device

Serial Connection

SSRez — RJ-45 — Renard64XC Controller — RJ-45 — SSRez

Lights

RJ-45 — SSRez   SSRez — RJ-45

Lights

Lights

Lights

Server

- Amazon EC2 instance running Ubuntu
- RESTful web service created using Flask, a microframework for Python web development
- Mobile device sends notifications or requests to the EC2 server using POST and GET commands
- Computer connected to lighting controller queries EC2 instance for new information
- Prevents having any issues with firewalls, network configuration, etc.

Client

- XBMC Plugin
- XBMC is designed for network playback and supports almost all audio and video formats
- Includes a built-in Python interpreter which allows users to develop add-ons
- Works on Linux, OSX, & Windows

Hardware

Renard64XC

- DIY Christmas light controller
- Uses PIC microcontrollers

SSRez

- DIY Four channel Solid State Relay
- Capable of switching up to 4 amps/channel