Team 304: ATS Training Application

Sponsored by Florida Power & Light

Alexis Cross, Christopher Sopeju, Kaitlyn Gurtner, Kevin Rodriguez & Max Urscheler

Team Introduction

Alexis Cross

Technical Specialist

Christopher Sopeju

Lead Programmer

Kaitlyn Gurtner

Team Leader

Kevin Rodriguez

Lead Designer

Max Urscheler

Test Engineer

Presentation Outline

- Project Information
- Progress Update
- Future Work

Project Information

Project Liaisons

Florida Power & Light

- Genese Augustin
  - Lead Project Manager
  - Smart Grid & Innovation
- Troy Lewis
  - Engineer II
  - Smart Grid & Innovation
- Kyle Bush
  - Project Manager

Faculty Advisor

- Reginald Perry, Ph.D.

Kaitlyn Gurtner

Objective & Motivation

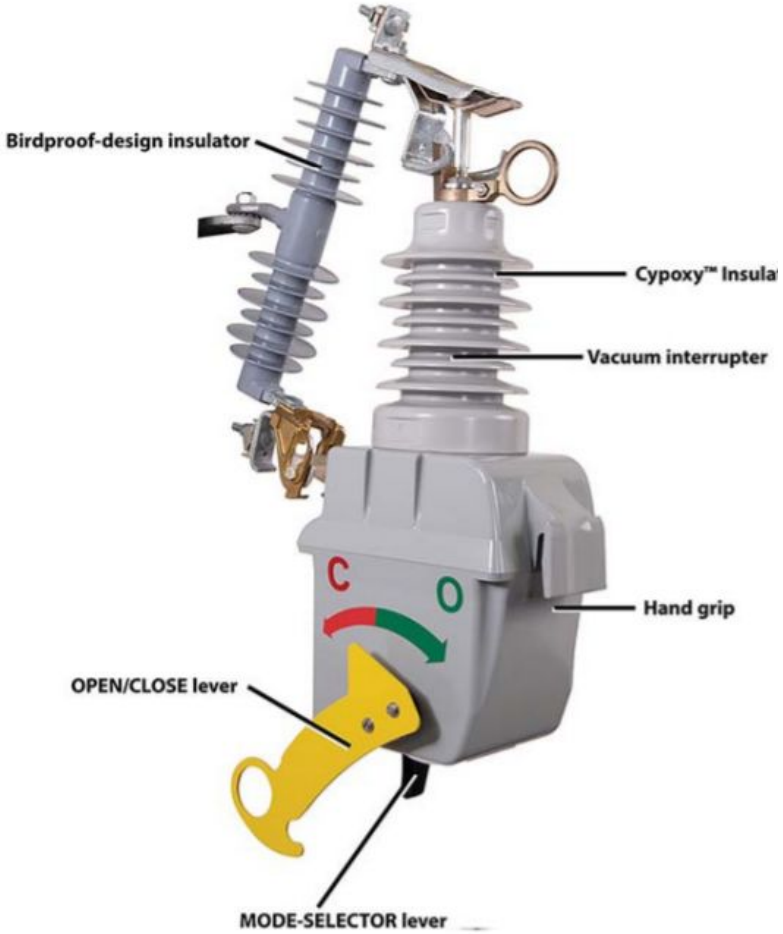
The objective of this project is to design an iPad application that will virtually train Florida Power & Light (FPL) employees on maintenance and troubleshooting procedures for the Automatic Transformer Switch (ATS).

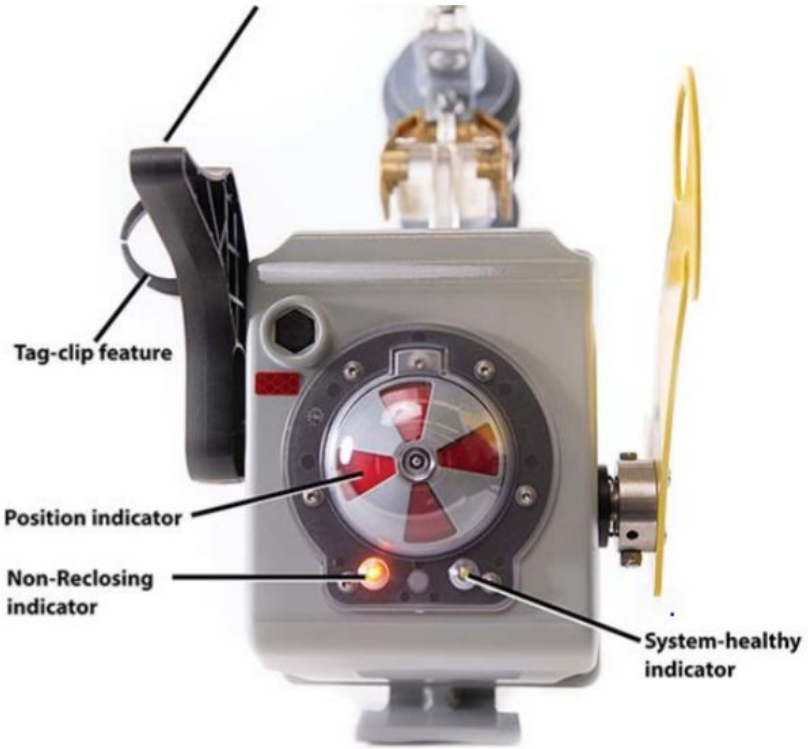
The application will provide an in-depth look into the switch along with the various mechanisms that must be used during temporary and permanent faults. In addition to training, employees will be assessed on their knowledge of normal ATS operation, and maintenance and troubleshooting procedures. The design will be implemented via 3D modeling software so the employee may interact with the model and do so virtually.

Background Information -
Automatic Transformer Switch (ATS)

- Ensures the continuous delivery of electrical power

- Manual Operating Lever
- Non-Reclose Lever
- Position Indicator Semaphore
- System Health LED
- Non-Reclosing LED

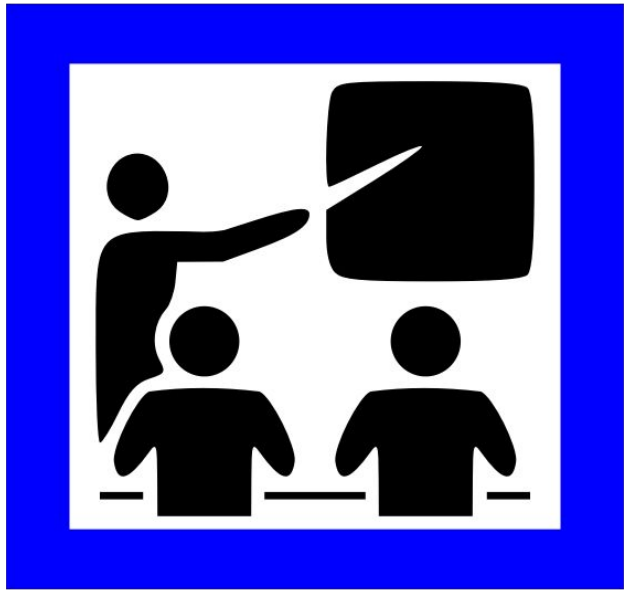




Kaitlyn Gurtner

ATS Operation - Training Procedures

- Normal In-Service Operation
- Operation During Permanent Fault
- Operation During Temporary Fault
- Non-Reclose Lever Operation
- Manual Open Procedure
- Manual Close
- Troubleshooting



Kaitlyn Gurtner

Project Progress

Project Progress - Fall 2020

- Documentation & Project Planning
  - Needs, Requirements & Targets
  - Functional Decomposition
  - Concept Generation & Selection
  - Preliminary Design (Flowcharts)
- Familiarization of Tools & Software
  - Unity
  - C#

Customer Needs

Identifier	Need	Source
N1	Train FPL employees on ATS maintenance procedures	Cust.
N2	Conduct training in a virtual manner	Cust.
N3	User-friendly/intuitive	Cust.
N4	Interactive experience	Cust.
N5	Easily distributed among FPL employees	Cust.

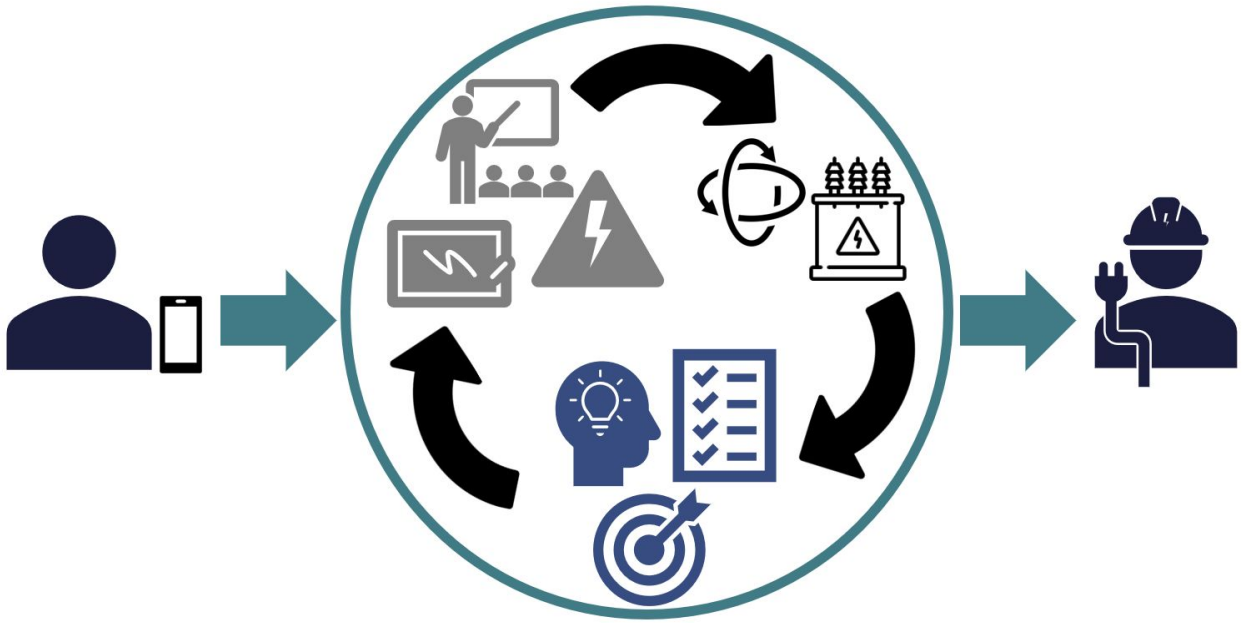
Kevin Rodriguez

Customer Requirements

Identifier	Requirement	Need(s) Met
R1	Educate on ATS components and their functions	N1
R2	Educate on ATS maintenance & troubleshooting procedures	N1
R3	Final design is an iPad application	N2, N3, N5
R4	Simulate ATS maintenance & troubleshooting procedures	N1, N2, N3, N4
R5	Assess the user's knowledge & provide feedback	N1, N4
R6	Provide feedback during simulations and assessments	N1, N3, N4
R7	Simulation behaves and appears like real life experience	N1, N3, N4
R8	Allow user to freely interact with ATS	N1, N2, N3, N4
R9	Enable user to request information on ATS components	N1, N2, N3, N4
R10	Demonstrate opening and closing of switch procedures	N1, N2, N3, N4

Kevin Rodriguez

Design Approach



The application design will model an interactive training session and will consist of the following:

- Informative Videos
- Demonstrations of ATS and Components
- Ability To Interact With And Request Information On ATS
- Assessments Of End User's Knowledge

Kevin Rodriguez

Selected Concept

- Production Method: Unity
- IDE: JetBrains Rider
- 3D Modeling: Maya
- Delivery Method: iPad Application
- Screen Design: Home/Menu
- Assessments: Multiple Choice & Scenario Based

Kevin Rodriguez

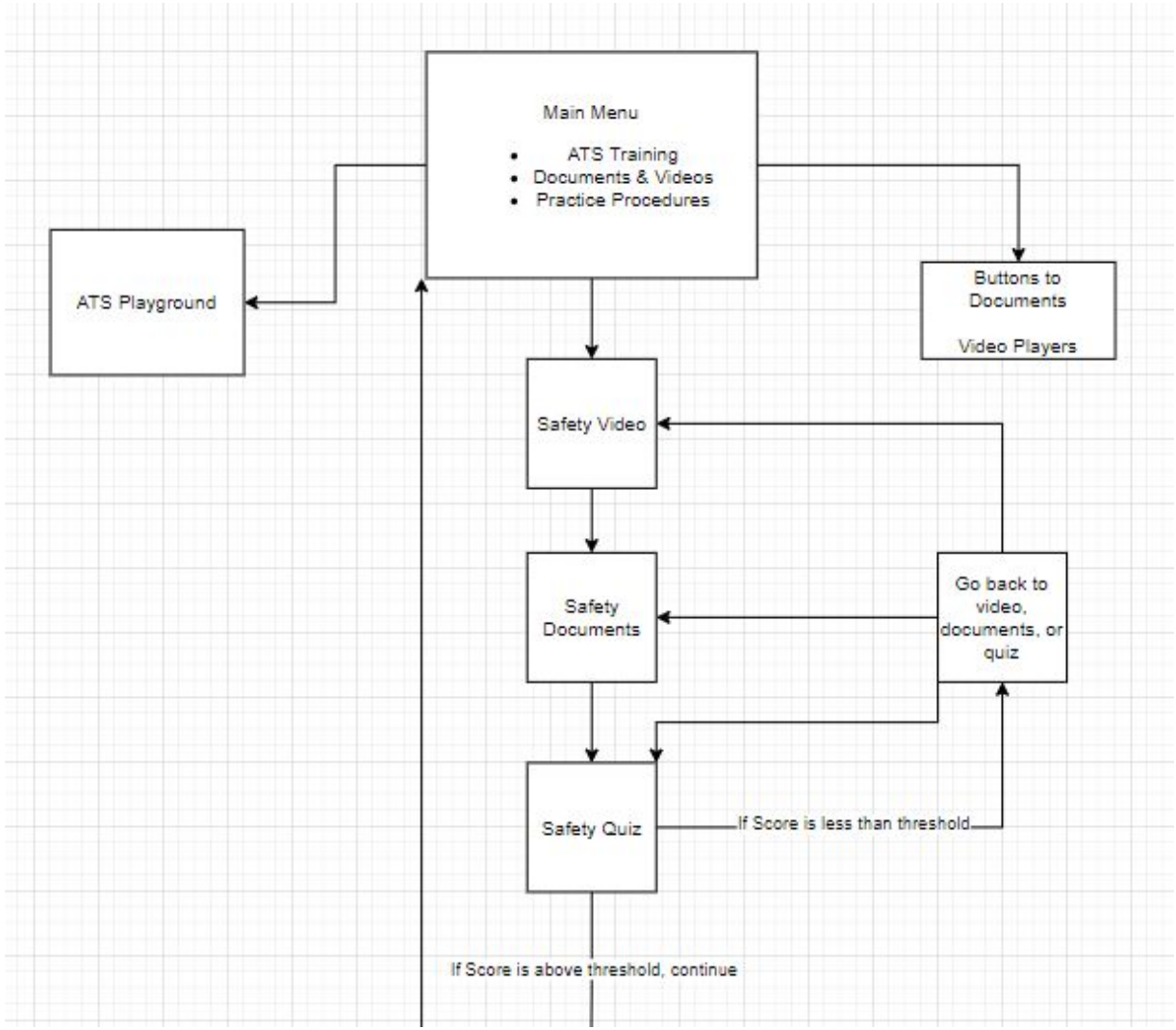
Project Progress - Spring 2021

- Storyboard
- Main Menu
  - Resource Gathering & Documentation Menu
- Assessment Module
  - Animations
  - Video Players
  - Version Control & Cloud Build
  - Website

Max Urscheler

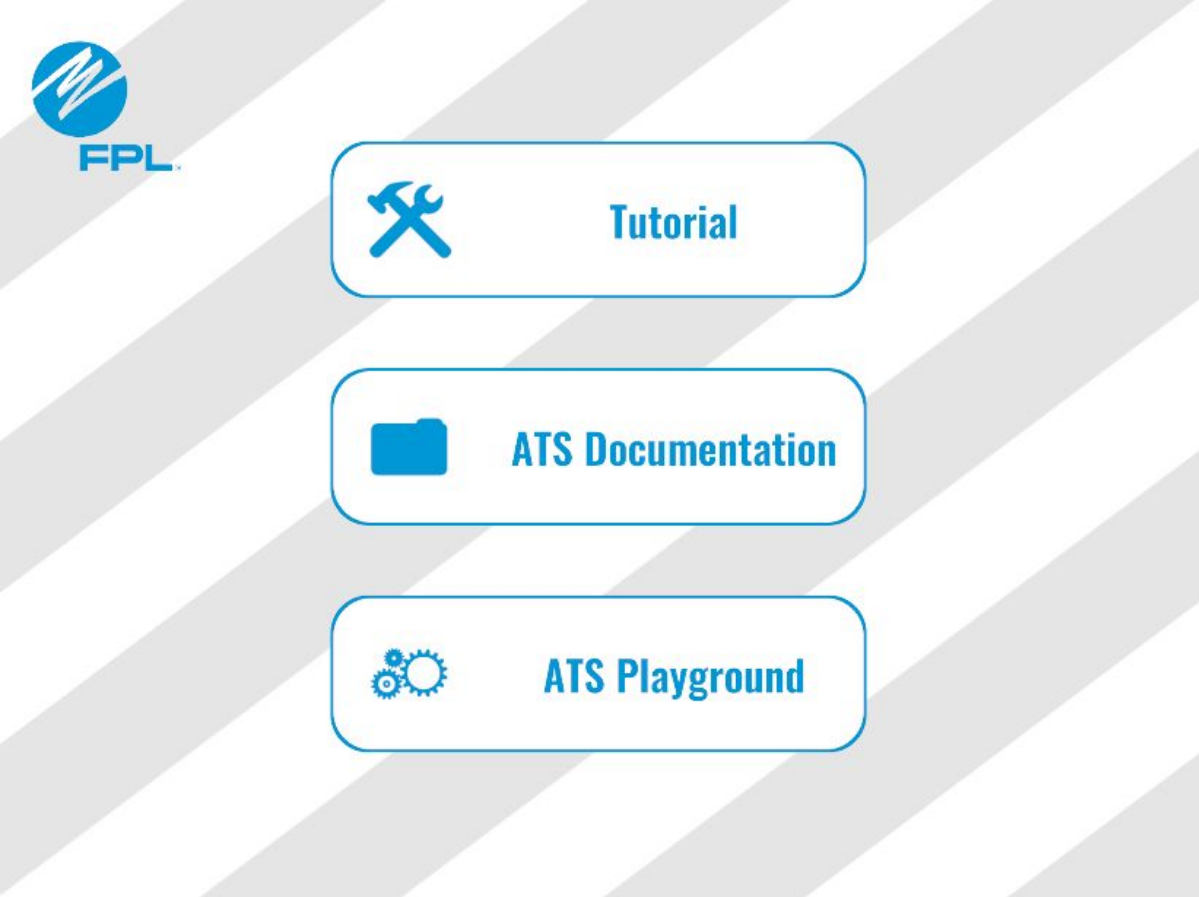
Storyboard

- Main Components
  - Storyline/Tutorial
  - “Playground”
  - Documentation



Max Urscheler

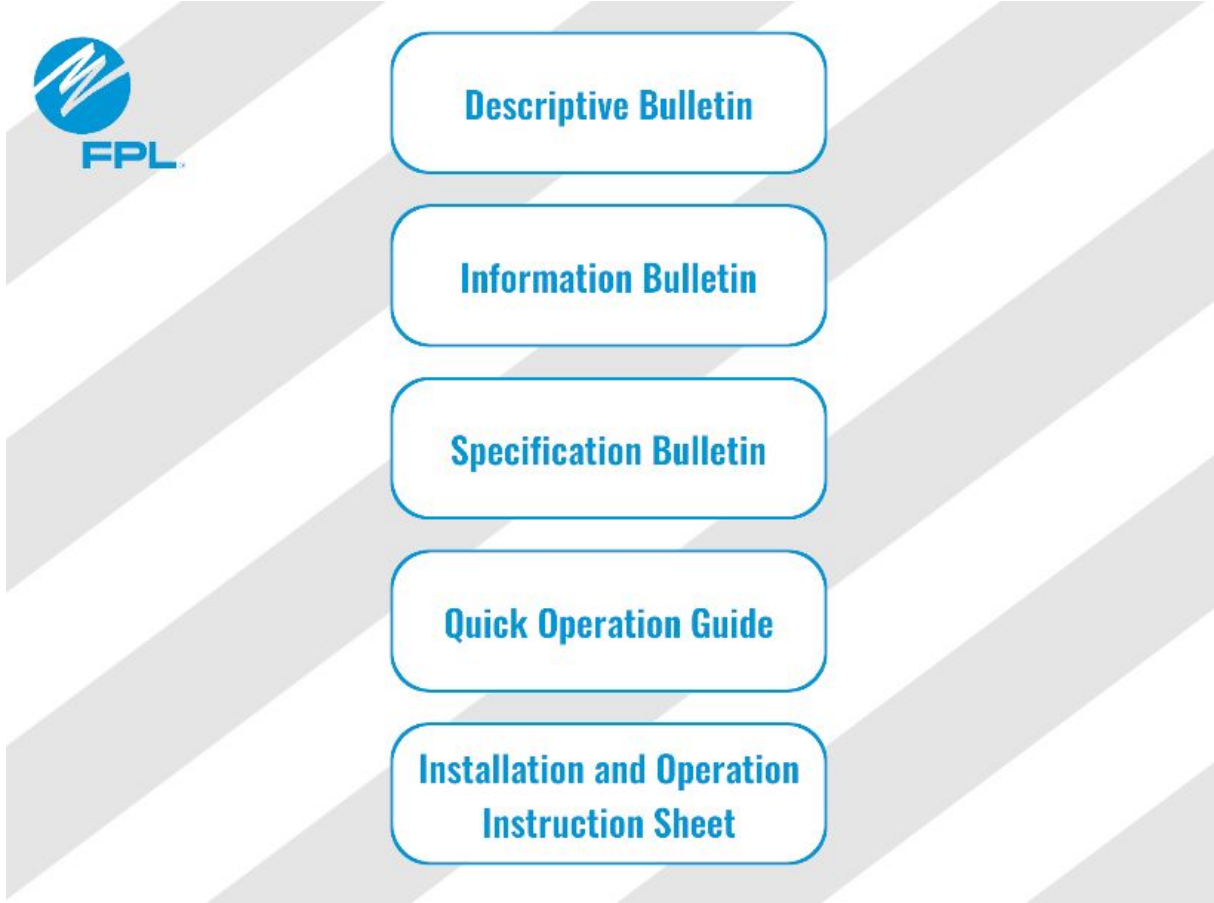
Project Progress - Main Menu



Max Urscheler

Project Progress - Documents Menu

Opens selected document in web browser



Max Urscheler

Project Progress - Resources

- Successfully Contacted S&C About CAD Model
  - Currently Waiting on File Delivery
    - Previously delivered 3D PDF, but not suitable for use within CAD Programs/Unity
    - Requested FBX file and awaiting deliver
  - Contact: Jeremy Nelson
- Working on segmentation of tutorial videos

Project Progress - Assessment

- Drafting of Questions
- Initial Unity Implementation
  - UI & C# Scripts
  - JSON: JavaScript Object Notation

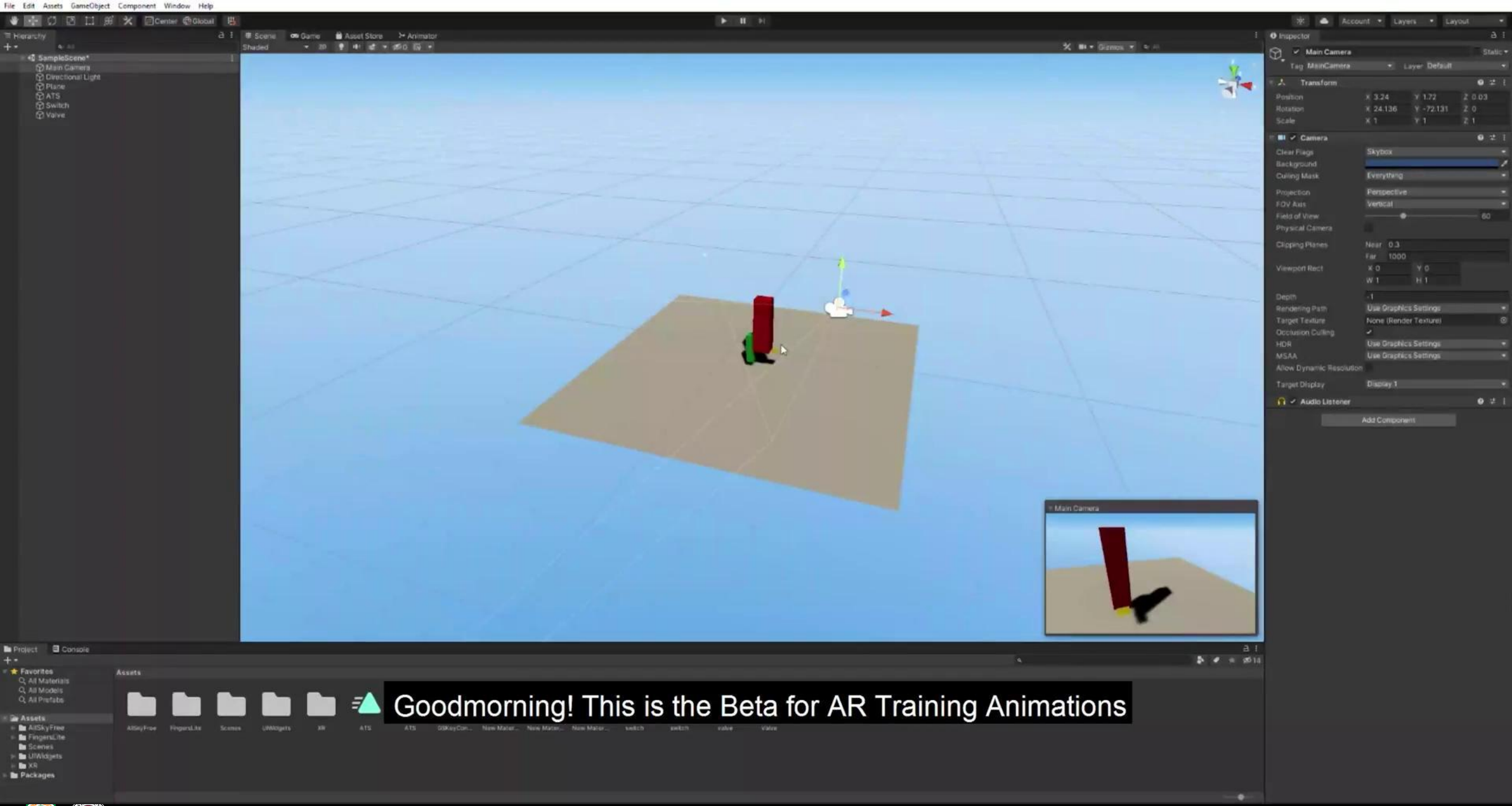
Project Progress - Assessment


```
{
  "allRoundData": [
    {
      "name": "ATS",
      "timeLimitInSeconds": 20,
      "pointsAddedForCorrectAnswer": 10,
      "questions": [
        {
          "questionText": "When the position indicator semaphore is RED, the vacuum interrupter is in which position?",
          "answers": [
            {
              "answerText": "OPEN",
              "isCorrect": true
            },
            {
              "answerText": "CLOSE",
              "isCorrect": false
            }
          ]
        },
        {
          "questionText": "What is the purpose of the Yellow Manual Operating Lever?",
          "answers": [
            {
              "answerText": "Automatic Reclosing",
              "isCorrect": false
            },
            {
              "answerText": "Manual OPEN/CLOSE",
              "isCorrect": true
            },
            {
              "answerText": "Interrupter Position",
              "isCorrect": false
            },
            {
              "answerText": "Troubleshooting",
              "isCorrect": false
            }
          ]
        },
```


Max Urscheler

Project Progress - Assessment

Max Urscheler


Goodmorning! This is the Beta for AR Training Animations

Project Progress - Video Player

Christopher Sopeju

Project Progress - Version Control

- GitHub Repository
- Contains:
  - Website Files
  - Application Files
  - Documentation Files

README.md

AR-Training-Application

FAMU-FSU College of Engineering Senior Design Team 304

Project Description

Create a user-friendly and intuitive virtual application that correctly trains and tests Florida Power & Light employees on how to perform maintenance on an ATS (Automated Transformer Switch).

Documentation

Further documentation for specific components in this repository.

- Unity Documentation
- Website Documentation

Color Scheme

Created using paletton based on main FPL color referenced as "Main Blue". Colors are given in the table below using their respective 6 digit hex values.

Color	Hex Value
Black	#000000
White	#FFFFFF
Gray	#696969
Main Blue	#0397D7
Light Blue	#0DA1E0
Dark Blue	#026A97

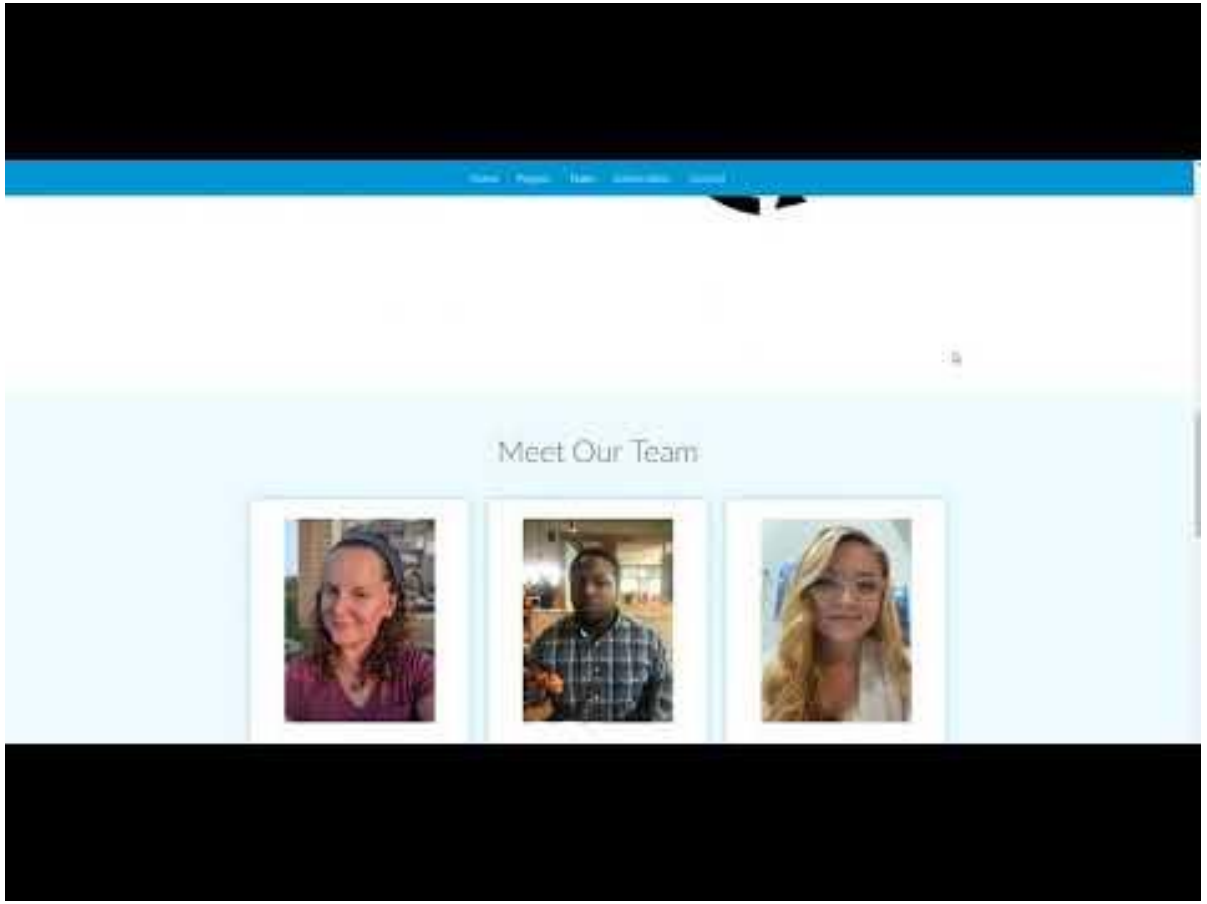
Christopher Sopeju

Project Progress - Cloud Build

- Direction integration with GitHub
- Automatically updates build
- Downloadable directly over cloud
- Issues with Apple certificates

Christopher Sopeju

Project Progress - Website



Christopher Sopeju

Future Work

Future Work

- Obtain CAD Model (FBX File)
- Application Components
  - Video Player
  - Continued Animation Development
  - Module Implementation
- Application Architecture
  - Observer Model
  - Database Implementation

Summary

- iPad Training Application
- Focus: ATS Maintenance
- Satisfy Customer Needs, Requirements & Targets
- Implement Derived Concept

Questions?