Miami Lib Finder

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Introduction

- Application

- Xamarin & C#

- MVC Framework

- Grid Mapping System

- Map Operation

Application

Homepage
- Map
- Search Bar
- Other Function
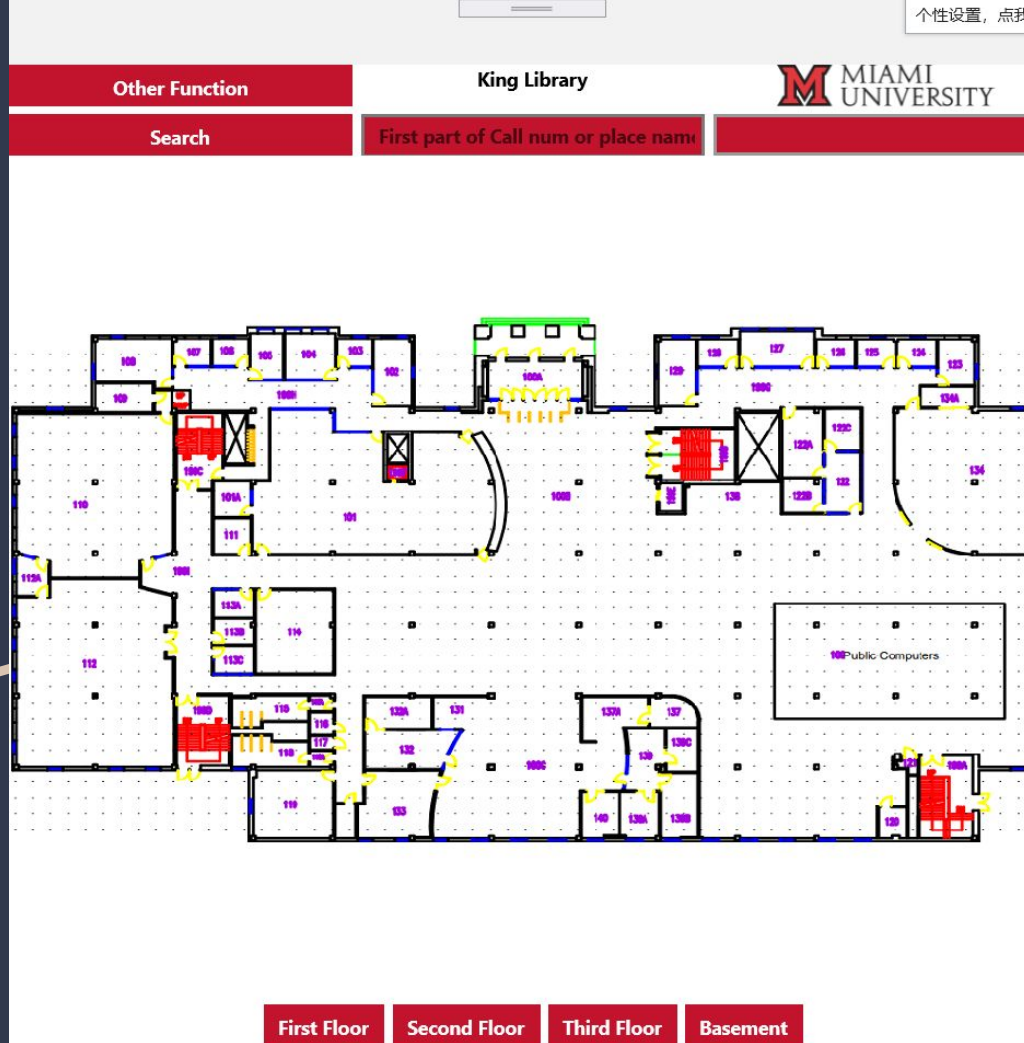
个性设置，点我

Public Computers

First Floor   Second Floor   Third Floor   Basement

test

Search

Search

Link

Google
Miami University
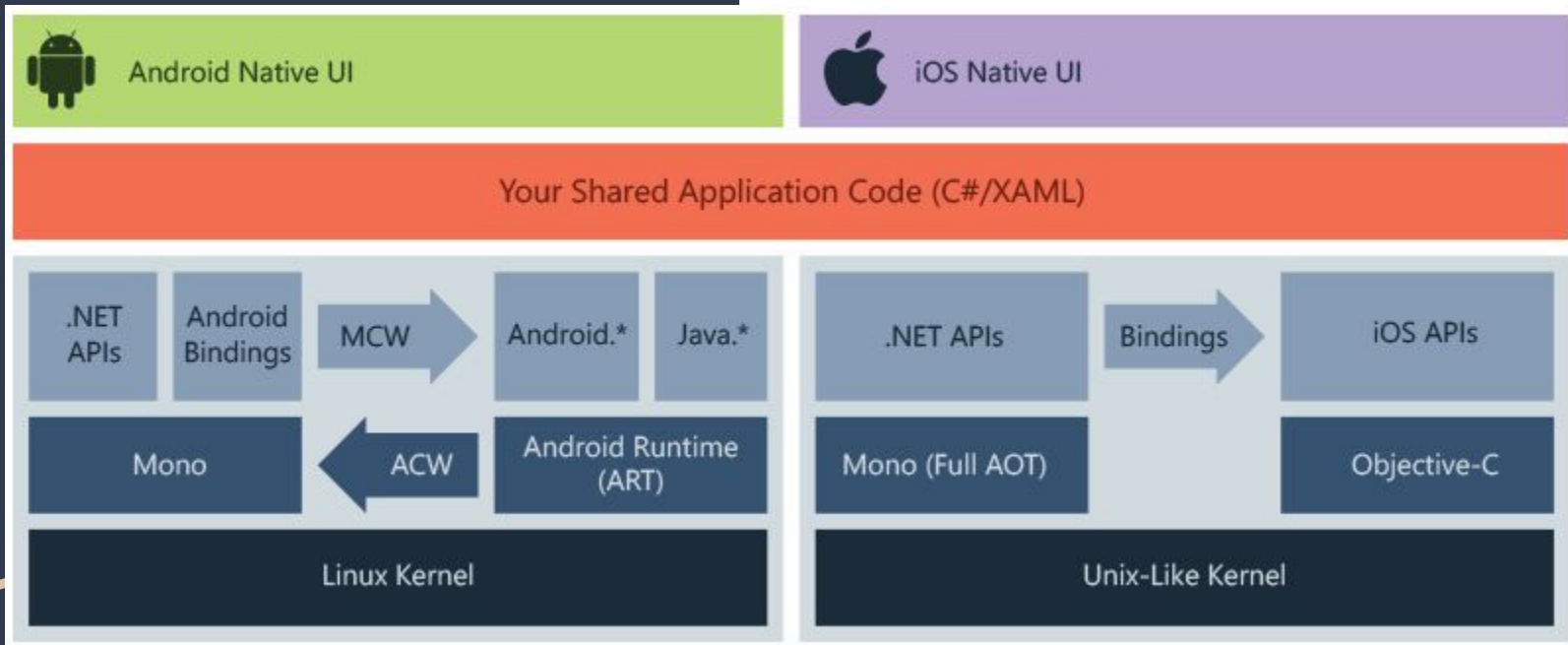Miami Libaray

MIAMI
UNIVERSITY

Xamarin

- Open-source platform for building applications for iOS, Android, and Windows with .NET.

- Xamarin is an abstraction layer that manages communication of shared code with underlying platform code.

- Xamarin can runs in a managed environment such as memory allocation and garbage collection.

Xamarin & C#

Android Native UI | iOS Native UI

Your Shared Application Code (C#/XAML)

| .NET APIs | Android Bindings | MCW → | Android.* | Java.* | | .NET APIs | Bindings → | iOS APIs |

Mono ← ACW | Android Runtime (ART) | Mono (Full AOT) | Objective-C

Linux Kernel | Unix-Like Kernel

Xamarin & C#

- Complete binding for the underlying SDKs
  1. Xamarin contains bindings for nearly the entire underlying platform SDKs in both iOS and Android.
- Robust Base Class Library (BCL)
  1. .NET BCL is a large collection of classes that have comprehensive and streamlined features
- Modern Integrated Development Environment (IDE)
  1. Xamarin uses Visual Studio
- Mobile cross-platform support
  1. Xamarin offers cross-platform support for the three major platforms of iOS, Android, and Windows.
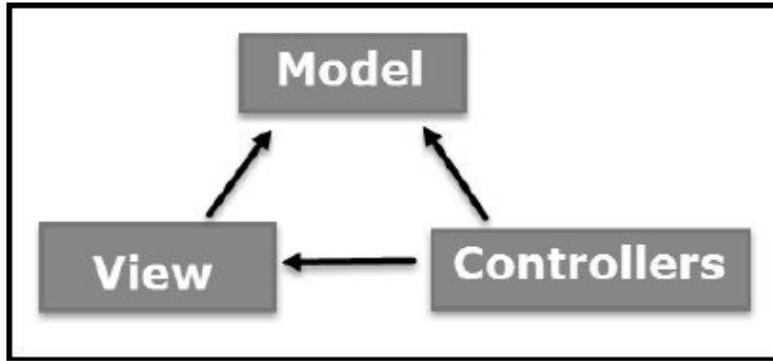
MVC Framework

Model-View-Controller

- The MVC is an architectural pattern that separates an application into three main logical components: the model, the view, and the controller.

- Each of these components are built to handle specific development aspects of an application.

- MVC is one of the most frequently used industry-standard web development framework to create extensible projects.
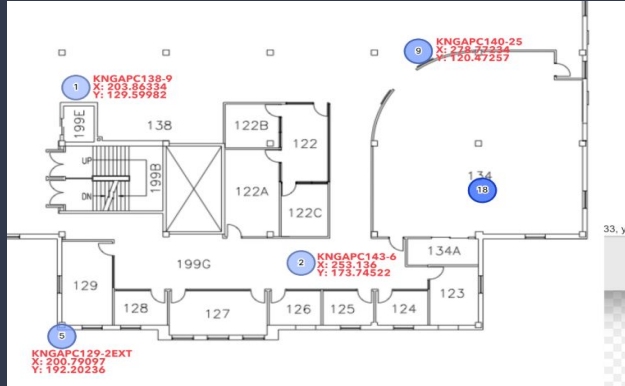
MVC Framework

- The **Model** component corresponds to all the data-related logic that the user works with.

- The **View** component is used for all the UI logic of the application.

- The **Controllers** act as an interface between Model and View components to process all the business logic and incoming requests, interact with the Views to render the final output.

Grid Map System

- For the Algorithm we use, we need to build a grid map system

- The tool we use is AutoCAD.

- First, we need get the real-world coordinate system based on the AP coordinate in library.

- Second, use the "Matrix" function in AutoCAD to place coordinate points and adjust it to make it consistent with the AP coordinate

PHP CAS

phpCAS

phpCAS is an authentication library that allows PHP applications to easily authenticate users via a Central Authentication Service (CAS) server.

Please see the wiki website for more information:

https://apereo.github.io/phpCAS/

Api documentation can be found here:

https://apereo.github.io/phpCAS/api/

MUnet Login

UniqueID

MUnet Password

LOGIN

Need help logging in?

Contact ITHelp at 513 529-7900 or Miami IT Chat.

- According to client needs, we want to protect the computer's status data from the library API.

- Using phpCAS to protect the computer status webpage.

PHP CAS

Station ID	Status
1019	powered_on
1023	offline
1024	powered_on
1025	offline
1034	offline
1035	powered_on
1052	powered_on
1058	powered_on
1061	powered_on
1069	powered_on
1075	offline
1078	powered_on

- In the webpage we made, users can view the status of the computer on each floor after logging in.

Mapping System

Visualization of the map data

- Based on the grid map system, we could transfer visual geometric pictures to usable data, when not much resources can be provided.
- After we have coordinate data and associated place information for each node, a mapping system can be easily built.
- A text file is used for storing such data.

name	x	y	floor
R001	41.6348	134.1029	0.0000
R004	105.4128	70.3249	0.0000

Mapping Algorithm

A*

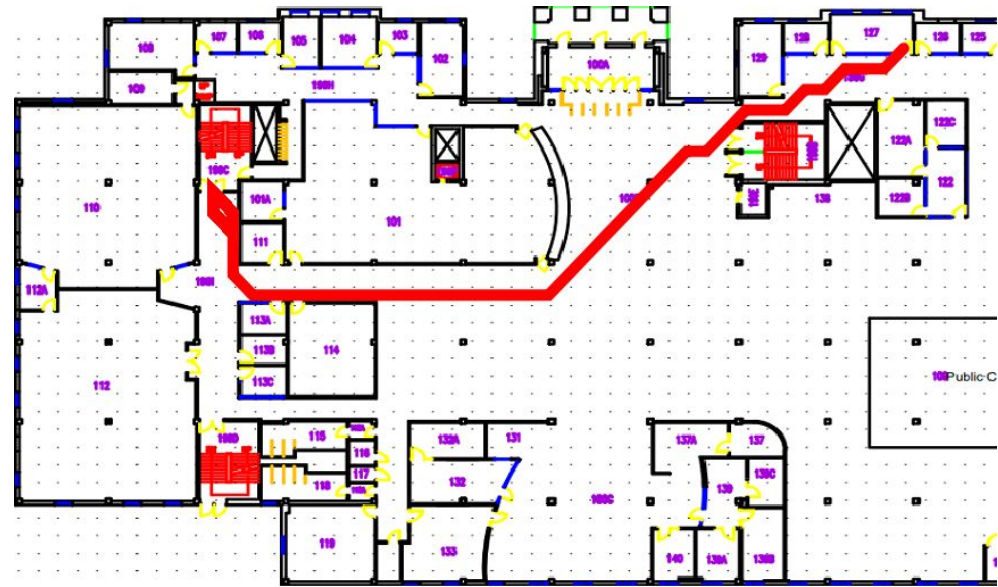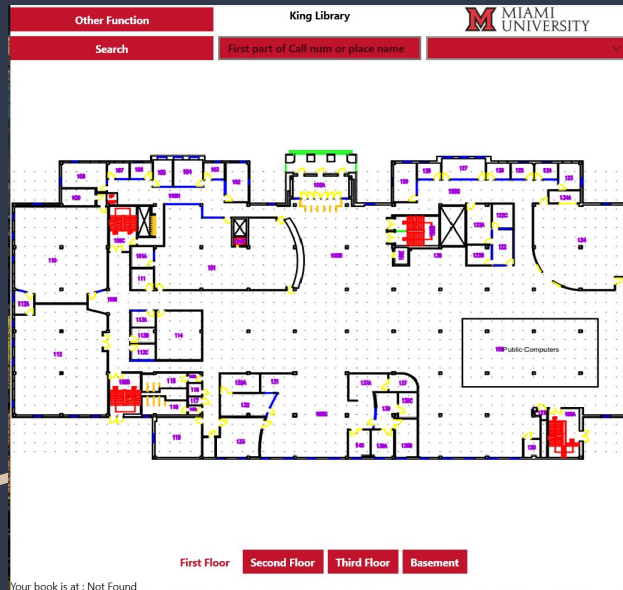"A* Pathfinding Algorithm". *Growing With The Web*, 2012.
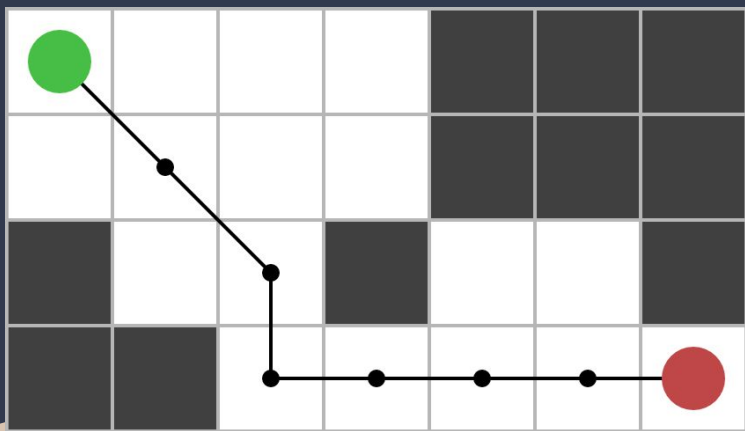
- Accurate
- High efficiency
- A* is the best suit algorithm for our current situation (a grid system that has evenly distributed distance among adjacent nodes on the map)
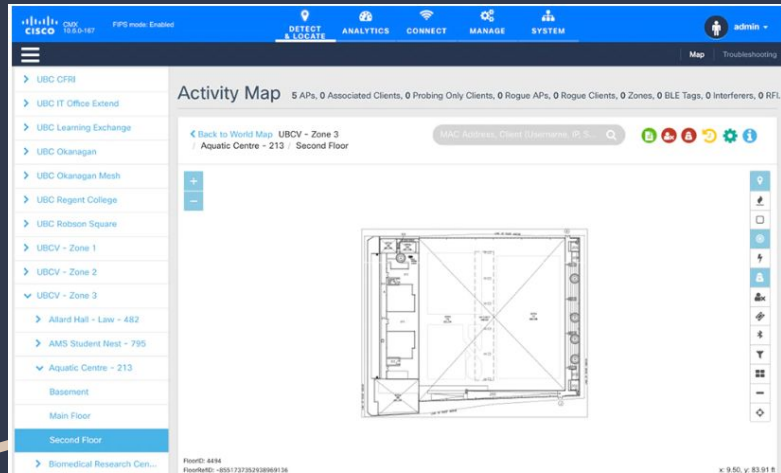- Easy to modify

Drawing Pathline

Skiasharp

Tracking System

CMX   (ideal)

Cisco CMX Interface

- Tracking the user's location is required
- GPS is not accurate and reliable at in-door environment.
- Any mobile or devices that access the in-door Wifi can be identifiable by the CMX system.
- Require library to allow every user who access Miami University public Wifi with MU account login in to retrieve their own access point data at King library in order to let app user know where they are.
- Some side effect on using CMX system (i.e. response time, precision, consistency, and maintain issue).

References Page:

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