

# Gridiron Visuals

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# **Football Context**



# Current Situation

- Hudl
  - Film Database
- Limits
  - Time together as a team is scarce
  - Typically 1-2 viewing angles max





Undo



○

00:21.95 / 00:30.30



Clips 1-51 of 51 < > Columns Filters

Save Playlist

PLAY #	PP	(O) PERSONNEL	(O) FORMATION	(O) SHIFT	(O) MOTION	(O) LINE ACTION	(O) PLAY DESCRIPTION
3							
4							

Share Reports

Practice 12 (7)

- 4/13 (D) 7 ON 7
- 4/13 (D) HALF SKELLY
- 4/13 (D) TEAM
- 4/13 (D) TRACKING
- 4/13/2023 GO PRO
- IP BOOM CHING!
- OL V DL 1V1

Practice 13 (7)

- (D) 4/15 TRACKING
- 4.15 (D) 1/2 SKELLY
- 4.15 (D) SKELLY
- 4.15 (D) TEAM INTERACTION 1
- 4.15 (D) TEAM INTERACTION 2
- 4/15/2023 GO PRO

OL/DL 1v1

Practice 14

Willamette University Aug 11

Other Items

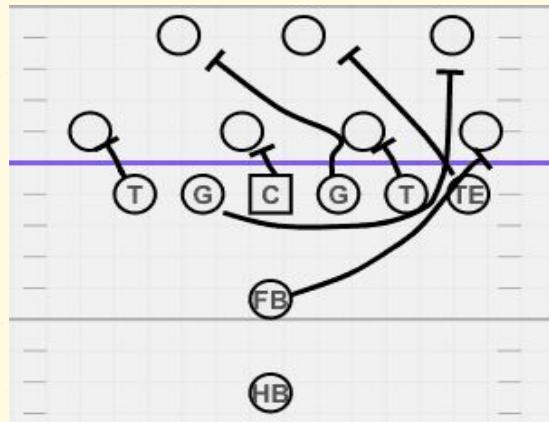
Mobile Uploads

2022-2023 Season

- (D) Disruption D Team Installs Mar 7
- (D) Pass Game Mar 8
- (D) Run Game Mar 8
- Spring Ball Practices Mar 10
- (O) TEACH TAPE BANK May 31
- (O) Summer Install Jun 1
- (O) SUMMER TEACH TAPE Jun 1
- Fall Camp Aug 11

# Learning Procedure

- Install
  - Coaches draw up 2d play
  - Circles are players, lines are where a player needs to go
- Run play in practice
  - Film the play, make adjustments
- Repeat
  - Decrease time it takes to make in-game decisions



# Current Issues

- A 2d play is difficult to visualize
  - Hundreds of variations on a play
  - Defense is also running their own play
- Limited amount of film
  - Can't watch every possibility
- Student before Athlete
  - Players often don't have sufficient time to meet with coaches to talk about plays
  - When schoolwork picks up, time dedicated to sports decreases

# How Our Project Helps

- Player learning curve
  - A player that can create and see every possibility can make decisions faster on the field
  - A first person viewing angle will allow the player to simulate a play from their position
- Less work for coaches
  - Less meeting time
  - Players can work within their academic schedules
  - Players learn faster so coaches can increase the size of their playbook

# Our Project



# **Project Scope**

- The goal of our software is to help athletes visualize on field scenarios more effectively
- The scope of this project includes the creation of scalability for the possibility of additional features.
- We have made a desktop app supported on Windows.

# Tools

There are a lot of components to an application that is not strictly programming:

- Models
- Animations
- Textures etc.

For these, we used the Unreal Engine base tools that they allow for use in any project. There are online tools that can also be used such as Mixamo and Sketchfab.

# User Interface

Player Button  
adds player to  
the field

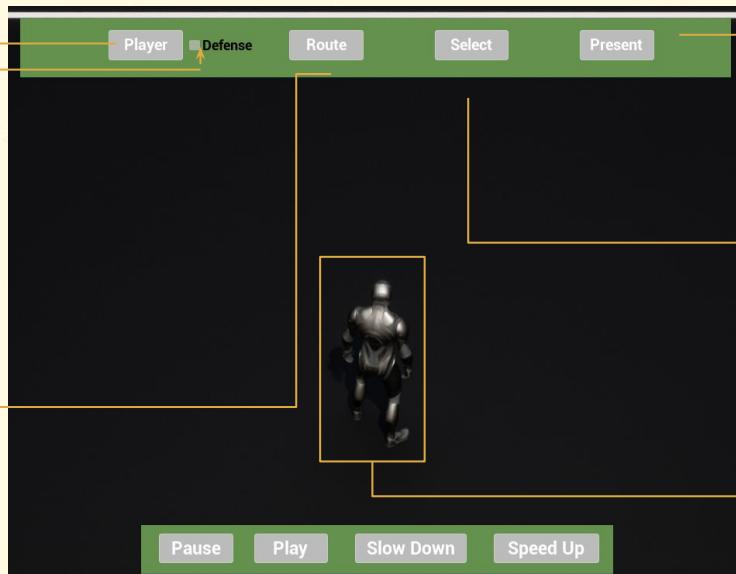
Decides  
whether or not  
the player is on  
the defense

Selects a player to  
add a Route point  
to and adds route  
point on left click

Switches between the  
Presentation mode and  
Planning mode(Hotkey R)

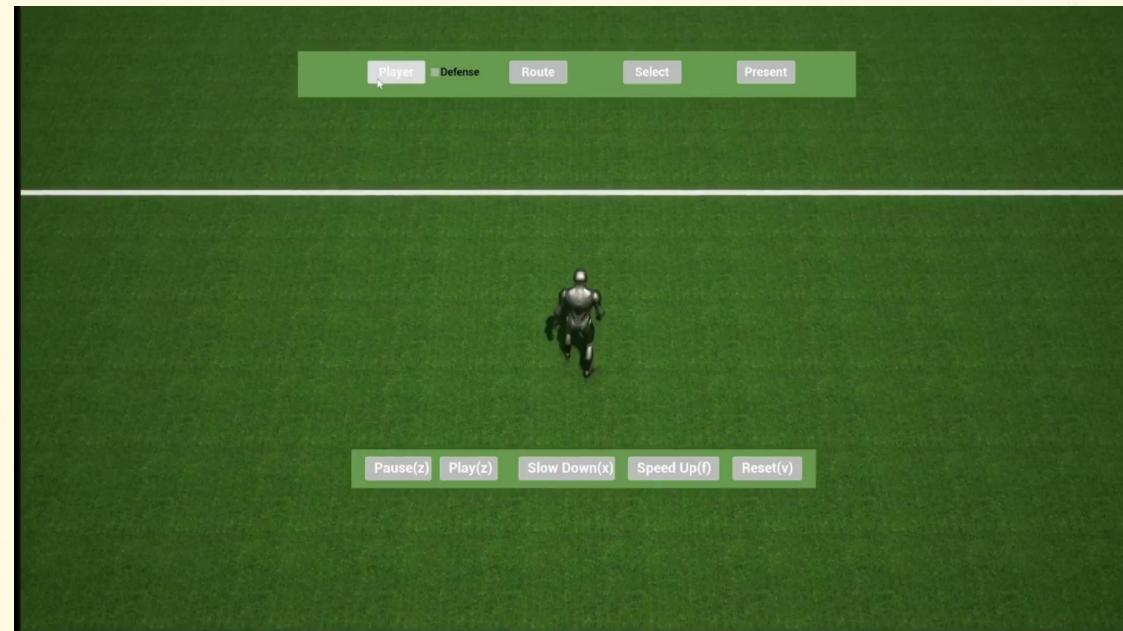
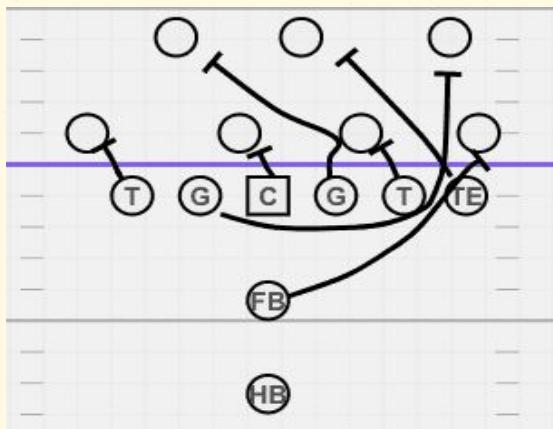
Select must be clicked to  
select on players during  
Presentation mode

Controlled  
character(moves with  
wasd)

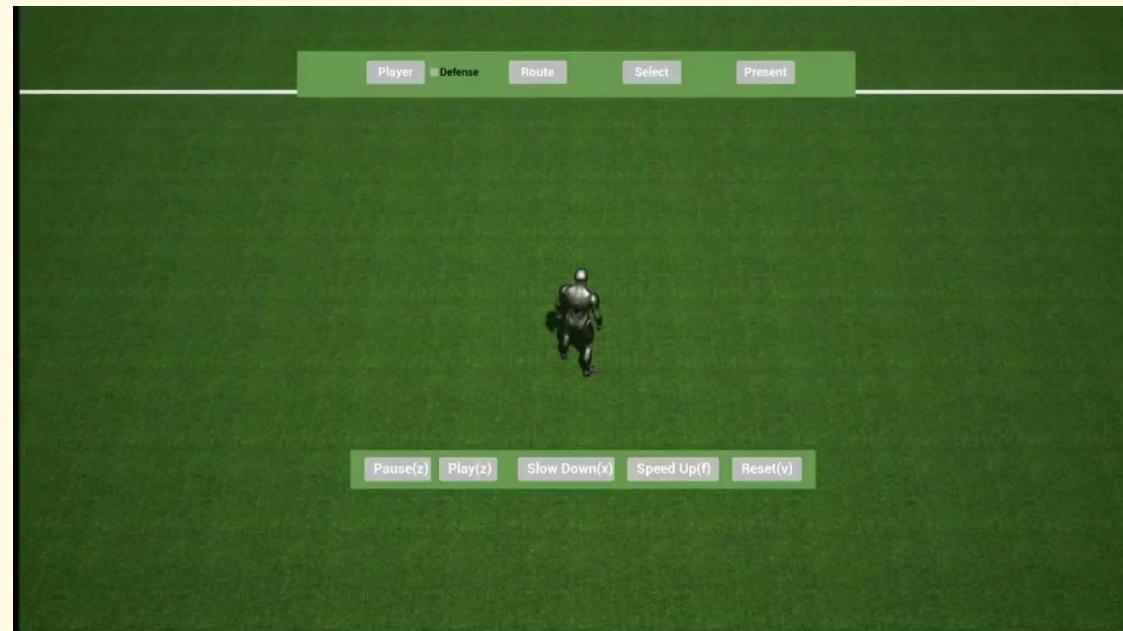
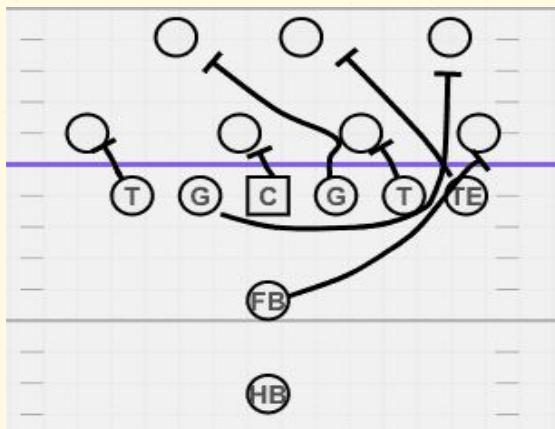


Button that control play speed. Pause and Play are both bound to z, Slow Down is bound to X, and Speed Up is Bound to F.

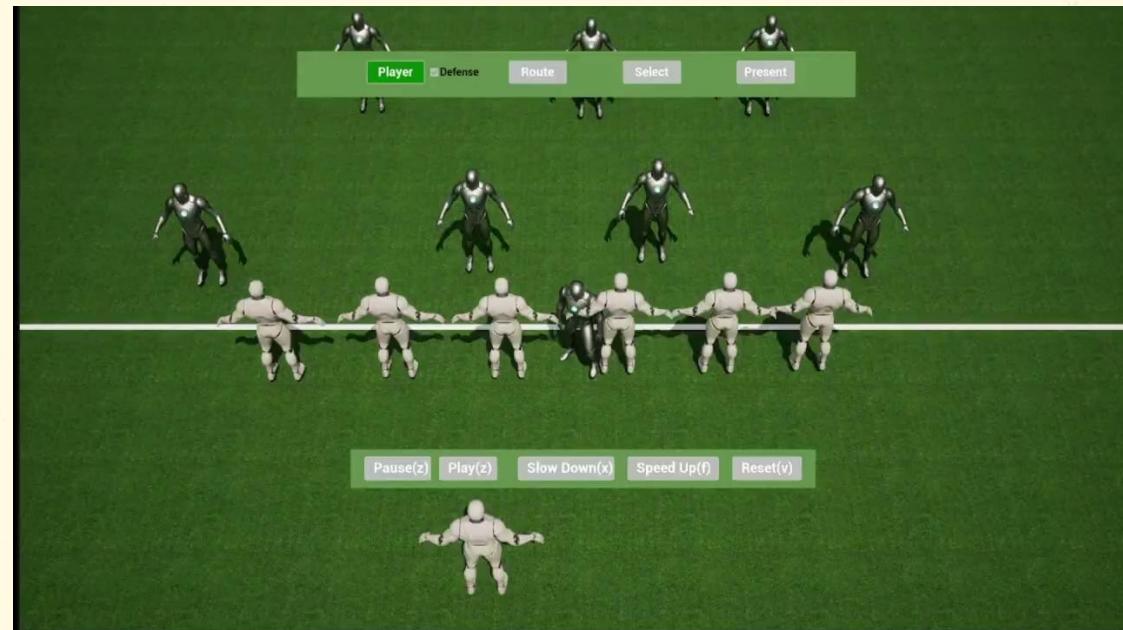
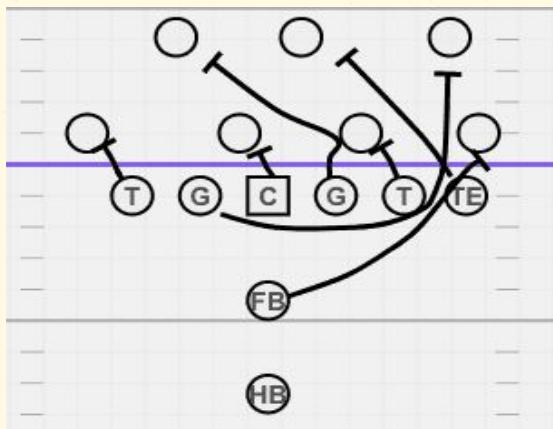
# Controls



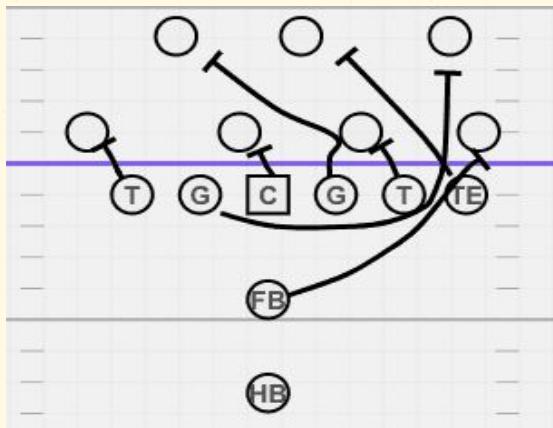
# Player Button



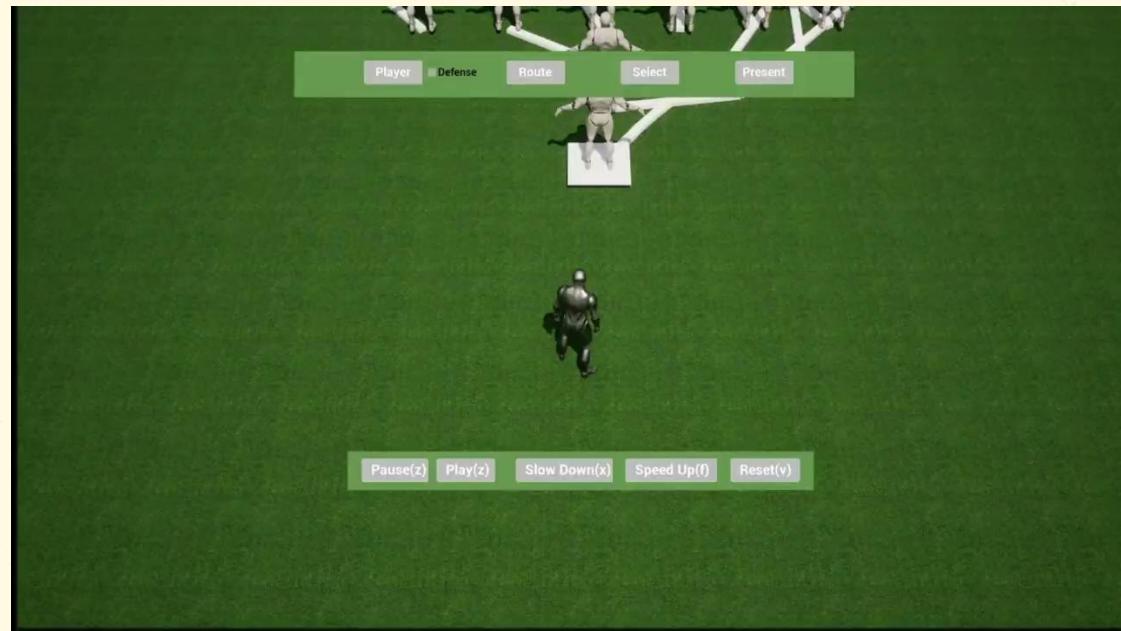
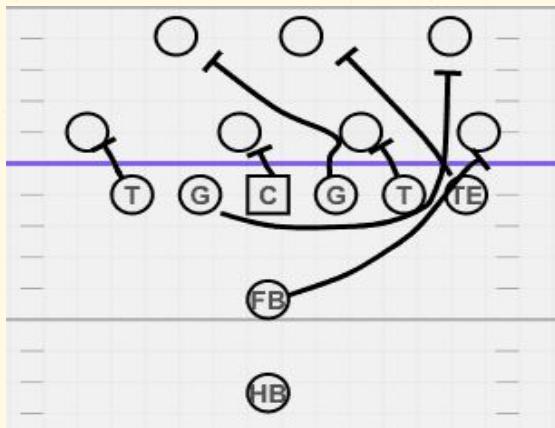
# Route Button



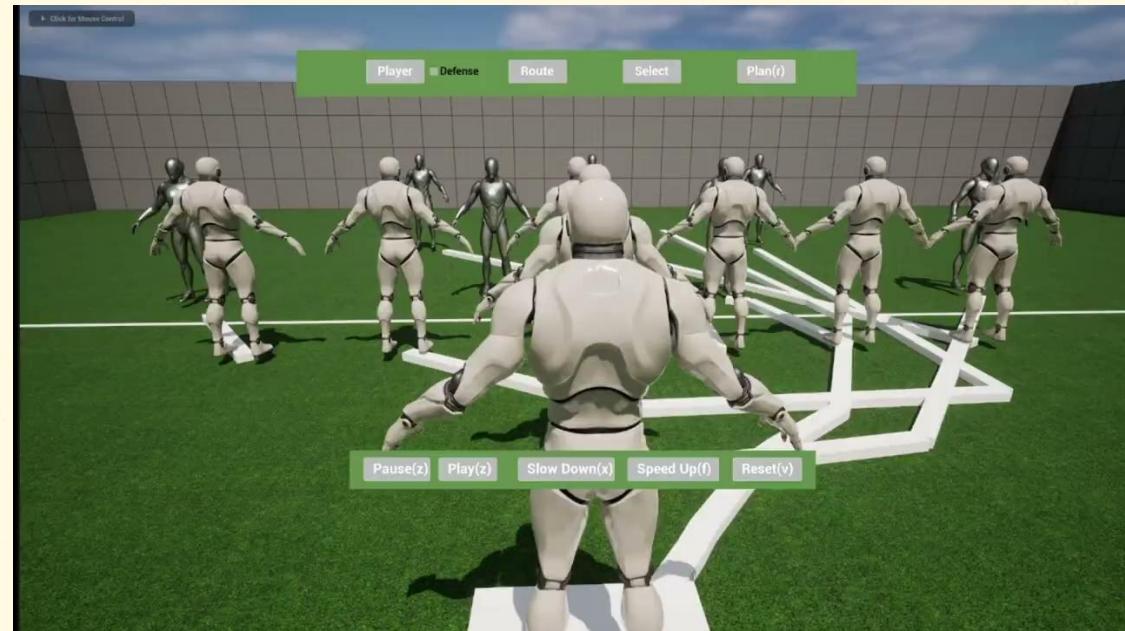
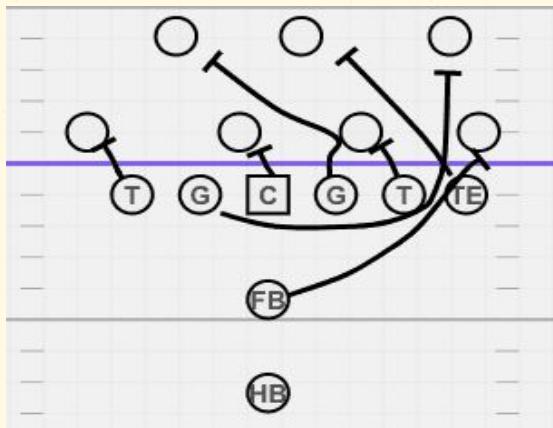
# Delete Button



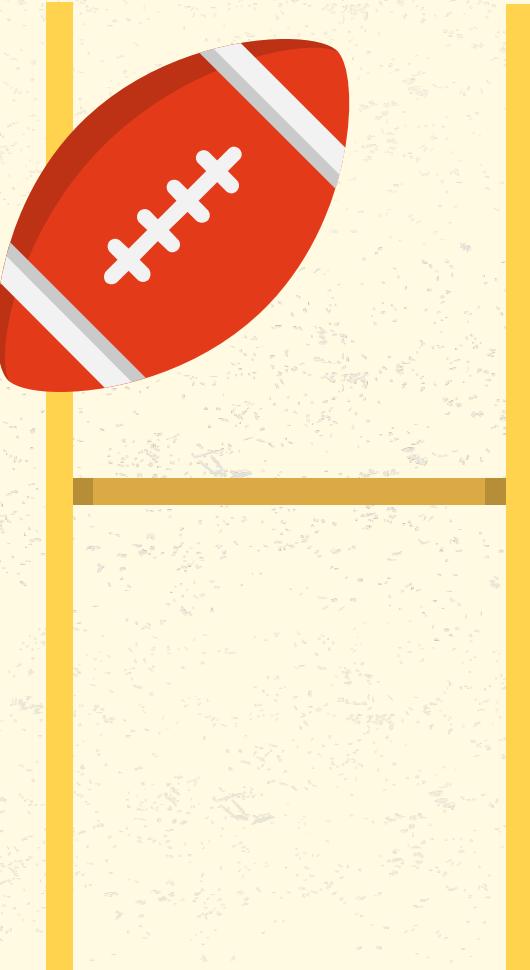
# Present Mode



# Through the Players Eyes



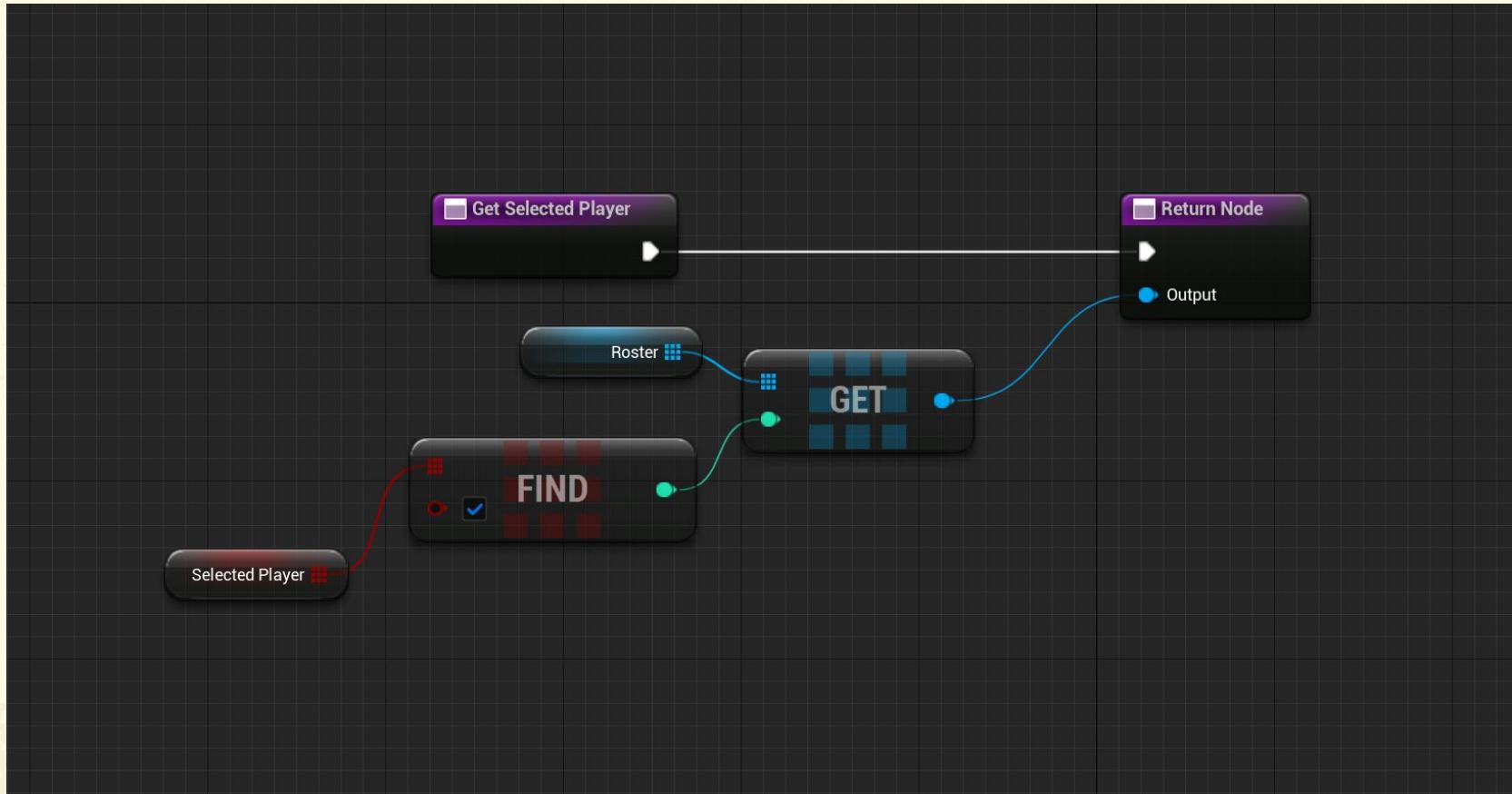
# **Peeling Back the Curtain**



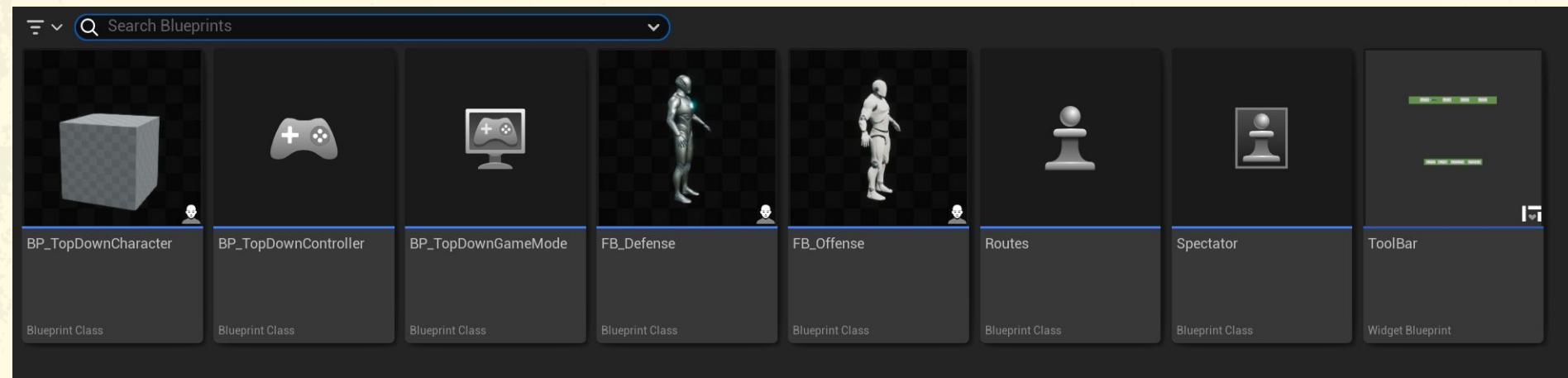
# Working with the Unreal Blueprints

1. Set up Inputs - Connect to Input Mapping
2. Set up Characters for Camera in Controller
3. Set up Rudimentary Interface Using Widget
4. Build Pawn/Actor Functionality in the Player Classes
5. Finish Interface
6. Polish/Document
7. Package

# Simple Function



# Classes (Objects)

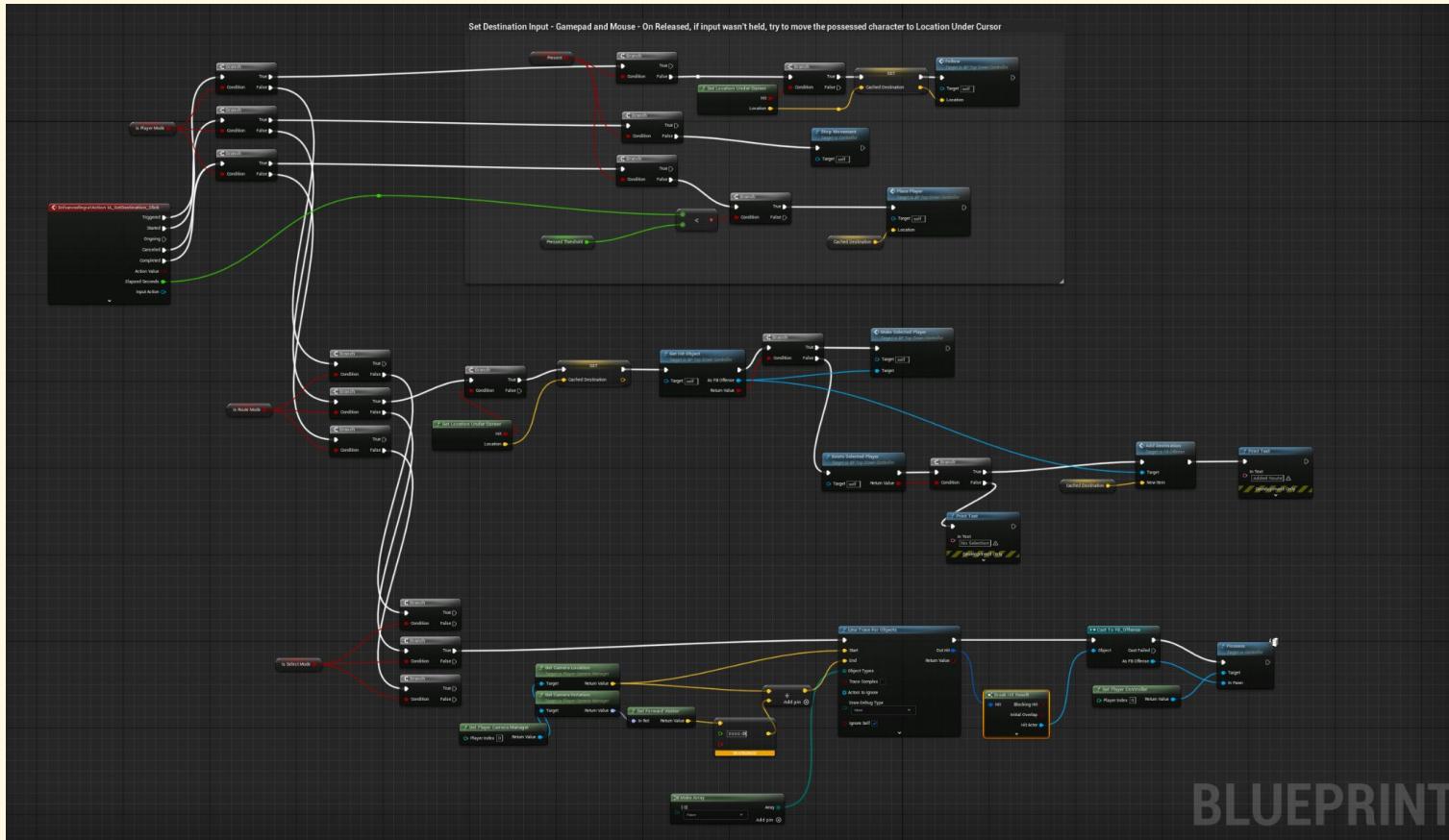


# Widgets

The screenshot shows a game development environment with a focus on UI design. The interface includes:

- Top Bar:** Includes "Palette", "Library", "Search Palette", "Zoom 1:1", "Selection: 68 x 25.03", and various icons for file operations like "None", "Lock", "R", "Screen Size", "Fill Screen".
- Left Sidebar:** Categories include **AUDIO**, **COMMON** (Border, Button, Check Box, Image, Named Slot, Progress Bar, Radial Slider, Rich Text Block, Slider, Text), **EDITOR**, **INPUT**, **LISTS**, **MISC**, **OPTIMIZATION**, and **PANEL** (Canvas Panel, Grid Panel, Horizontal Box, Overlay, Safe Zone, Scale Box, Scroll Box, Size Box, Stack Box, Uniform Grid Panel).
- Bottom Left:** "Hierarchy" and "Bind Widgets" panels, and a "Search Widgets" search bar.
- Central View:** A grid-based canvas showing two horizontal bars of buttons. The top bar contains "Player", "Defense", "Routes", "Select", and "Present". The bottom bar contains "Pause", "Play", "Slow Down", and "Speed Up".
- Right Sidebar:** "Details" panel for the "TextBlock\_2" component, showing properties for **Slot (Button Slot)** (Padding: 40, 20), **Content** (Text: Present), **Appearance** (Color and Opacity, Font: Roboto, Bold, Size: 16), **Font** (Font Family: Roboto, Typeface: Bold, Size: 16, Letter Spacing: 0, Skew Amount: 0.0), **Outline Settings** (Stroke Brush, Shadow Offset: 1.0, Shadow Color), **Advanced**, **Accessibility** (Override Accessible Defaults, Can Child be Accessible, Accessible Behavior: Auto), **Performance** (Is Volatile), **Clipping**, **Clipping**, **Wrapping** (Auto Wrap Text, Wrap Text At: 0.0), **Advanced**, and **Behavior** (Tool Tip Text, Is Enabled, Visibility: Visible).
- Bottom:** "Device Content Scale 1.0", "No Device Safe Zone Set", "1280 x 720 (16:9)", "DPI Scale 0.67", and "2 Unsaved" status.

# Complex Functions (Clicking)



BLUEPRINT

# **Future Research/Planning**

- Implementing more function
  - Deletion of players/routes
  - “Presentation Mode” movement
- Visuals
  - Animations
  - Textures
  - Collisions
- User Interface
  - Talk to football staff for input

# Requirements Engineering

- Met with the Offensive Coordinator of the Willamette Football Team
  - Meeting Potential Clients
  - Version 0.1
  - Get out of our Developing heads

# Conversation With Coaches

## ■ Recommendations:

- Implement a playbook function where we make premade plays/routes and coaches can edit and save them
- Instead of routing each player has “rules” for what they’re meant to do on a play
- Don’t have so many buttons/more user friendly

# Reflection

- What Did We Learn?
  - Teamwork is tough with dynamic schedules
  - Unreal engine blueprint is tougher than a traditional language in some ways but easier in others
  - With this project it took a long time to just learn the language so the timeline needed to be shifted just a couple weeks back but things came together quickly.

# Thank you!

Questions/Suggestions?