

# Game System Design

Assassin's Creed – Navigations, Control, Combat & Camera System

By Ajay Chaudhary

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# Assassin's Creed Control, Camera System, Combat & Navigation




















## Assassin's Creed Controls

### Controls Mapping

Control mapping for PC, PS3 and Xbox Platform.

#### Basic controls:




Contains movement of character, selection of weapons, camera controls, menu controls and game map control.

Windows (PC Keyboard)	Xbox 360	PlayStation 3	Usage
W/A/S/D			Movement
			Camera Rotation
1			Short blade / Knife throw
2			Hidden Blade
3			Long Blade/Sword
4			Fist
F			Lock On
Q			Chase Camera
Esc			Animus Menu
Tab			Map

## Game System Design



### Low Profile Controls

This is the default profile that protagonist is always on. Under low profile player has the ability to move through crowds, blend and pick pocket.

Windows (PC Keyboard)	Xbox 360	PlayStation 3	Usage
E			Eagle Vision, Synchronize (On top of a View point)
Spacebar			Blend in the crowd (Prayer crowd)
Shift Key			Gentle Push, Drop while hanging (Ladder, Cliff)

### High Profile Controls











High profile control when activated changes the context of action buttons. Under high profile player has the ability to Run, Fight and free run grab people.

Windows (PC Keyboard)	Xbox 360	PlayStation 3	Usage
			Activate (Release to Deactivate)
			Attack with Equipped Weapon
Spacebar			Free Run, Jump
Shift Key			Grab a Person

## Game System Design










### Map Controls

Once the world map is opened player can use the controls to explore the map.









Windows (PC Keyboard)	Xbox 360	PlayStation 3	Usage
Tab			Enter/Exit Map
			Scroll Map
Mouse Scroll			Zoom In/Zoom Out
Legends Button			View Legend
LMB			Set Marker
			Cycle through Icon Display









### High Profile Control Combination



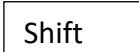






High profile control switching requires player to press and hold Activate button + required action button.

Platform	High Profile + Action Button	Usage
PC	 +  + 	Attack with equipped weapon
PC	 +  + <span>Spacebar</span>	Jump
PC	 +  + <span>Spacebar</span>	Press and hold to Run
PC	 +  + <span>Shift</span>	Grab Person

## Game System Design

Platform	High Profile + Action Button	Usage
Xbox 360	 + 	Attack with equipped weapon
Xbox 360	 + 	Jump
Xbox 360	 + 	Press and hold to Run
Xbox 360	 + 	Grab Person

Platform	High Profile + Action Button	Usage
PS3	 + 	Attack with equipped weapon
PS3	 + 	Jump
PS3	 + 	Press and hold to Run
PS3	 + 	Grab Person

Platform	High Profile + Action Button 1 + Action Button 2	Usage
PC	 +  + 	Tackle while running
Xbox 360	 +  + 	Tackle while running
PS3	 +  + 	Tackle while running

## Assassin's Creed Camera System

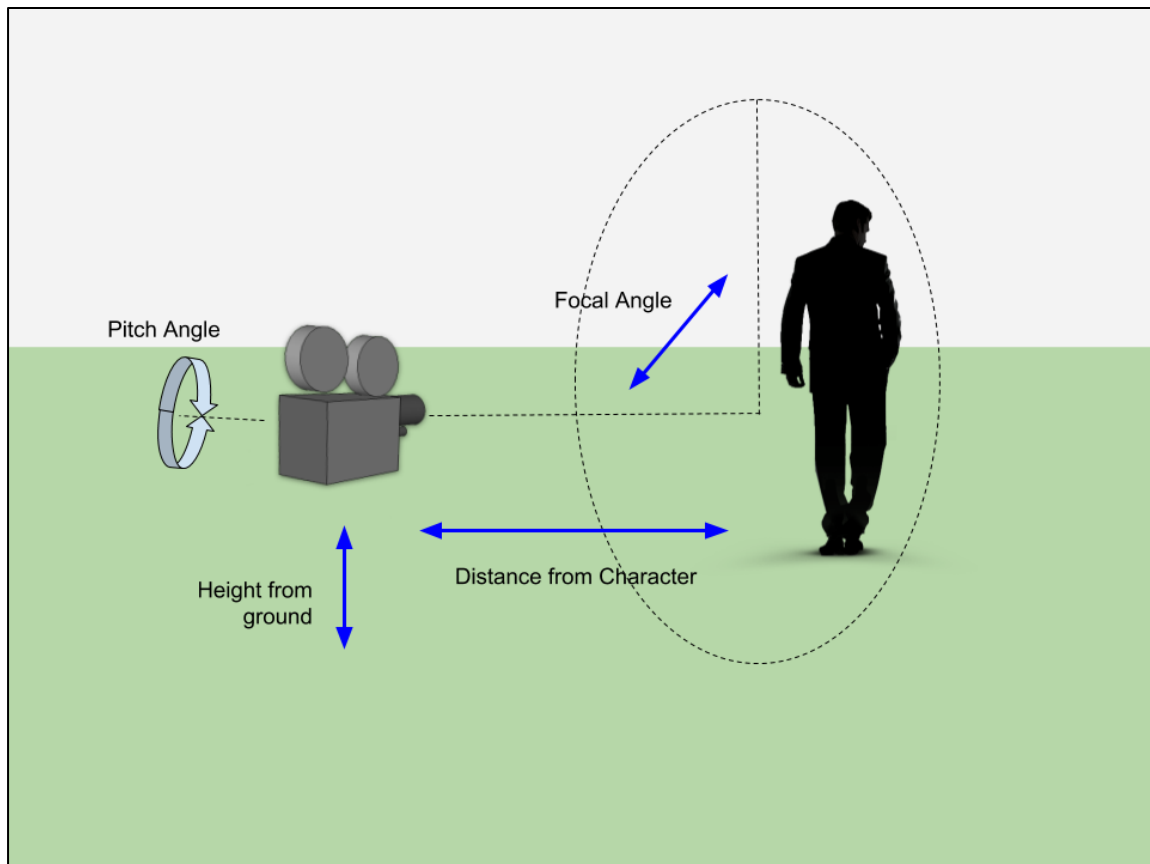
### Character Camera System.

- Basic camera view contains a third person angle.
- Camera rotates 360 degrees around the main character.
- Camera system will contain collision.
- Collision will prevent the camera from entering the terrain, building, NPC or Prop in the game.
- Camera movements are anchored to the character Pivot.
- Where the character moves the camera will move.
- Camera will be capable of moving in X/Y/Z axis in 3D space.
- The camera will not move in Y axis when the character performs a normal jump

Parameters required to adjust camera in follow mode:

- Height from ground (Units)
- Distance from character (Units)
- Pitch Rotation (Units)
- Horizontal angle of view (Degree)
- Horizontal offset (Units)

### Basic Camera Setup



### Camera Controls

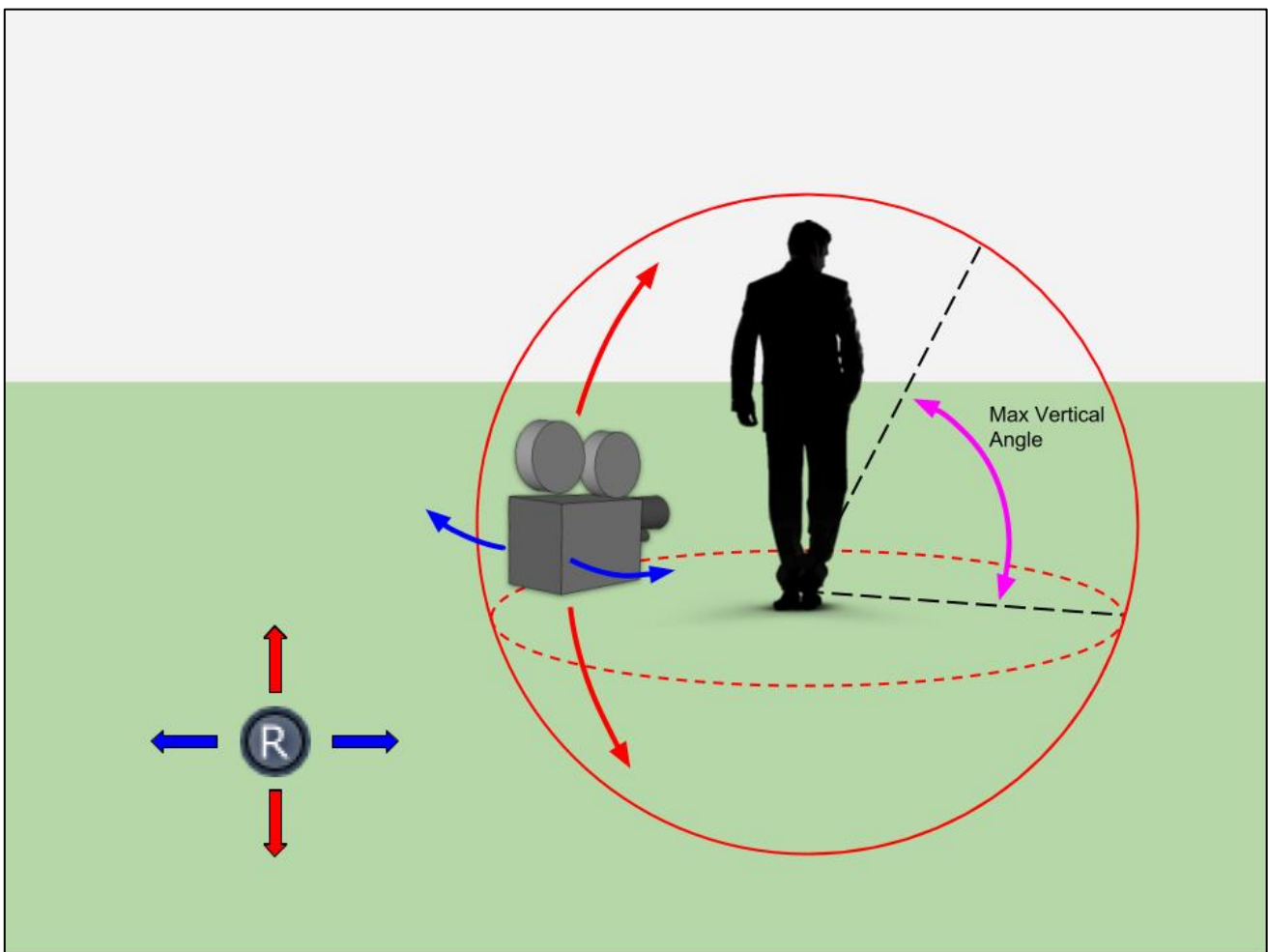
Assassin creed control mapping shows which controls the camera will be mapped with.

Using X/Y unit's player will is able to move the camera around the character sphere. Player can move the camera freely on the sphere around the character, with camera always looking at the character.

The movement has a specific acceleration and its max speed together. The camera move is vertically limited by a limited angle (During cinematic).

Design Parameters for camera free roam mode:

- Free move radius (Units)
- Free up move distance (Units)
- Free down move distance ( Degree)



### Camera Follow Action

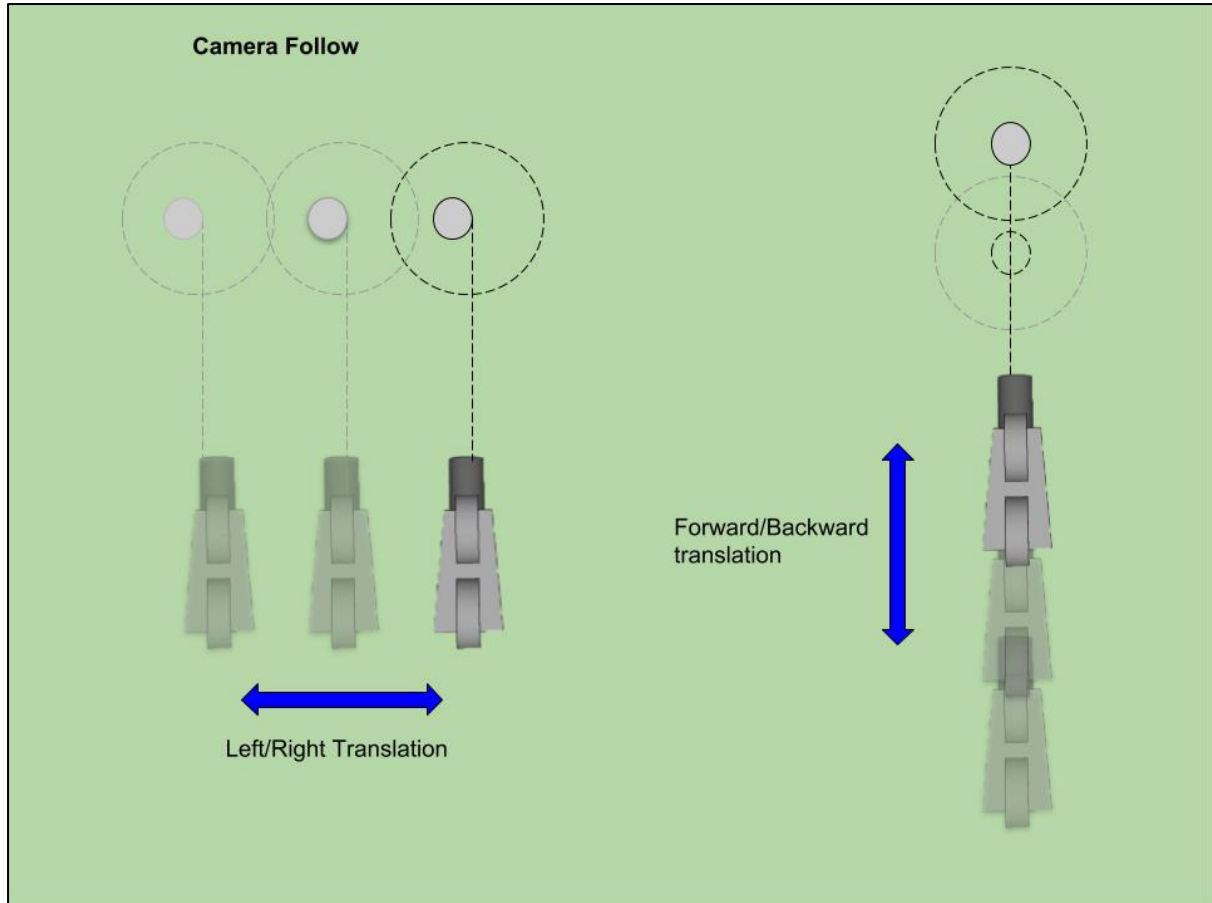
Assassin's Creed follow camera is a simple setup. Camera while in free roam mode will follow the player.

Depending on horizontal or vertical follow different constraints/rules will lead to new position and orientation of choice.

## Game System Design

Design Parameters for camera follow:

- Follow smooth inertia
- Angle to return from free roam to standard default mode
- Max pitch angle



Camera will follow the player where they travel. Tied to the character pivot. In assassin's creed camera follows the player where ever they move in the 3D world with a world view.

### Speed and Camera Distance:

Speed and camera distance is relative which is observable when the player does a leap of faith or while running.

When speed of the character increases the distance also increases.

Design Parameters:

- Min Speed to start increase distance (Unit/Sec)
- Max Speed to start increase distance (Unit/Sec)
- Max distance from character.

There are a max speed and a max distance to clamp this behaviour. When the character exceeds a specified front speed, the camera starts to increase the distance with the character for the player to have a better view on where he goes.

## Game System Design

### Camera Collision

#### Collision Rules:

- Maintain minimum distance from the free move zone
- Camera collider does not enter another collision sphere
- When they collide the camera collision slides over the other collider smoothly
- Collision is allotted the highest priority.

### Eagle Vision Camera

Eagle eye vision enables the player to focus on different enemy targets. It allows the player to distinguish between different enemies and potential target tied to the current mission.

Eagle vision switches the camera to First Person view.

#### Activation/Deactivation:

- Player has to press E (PC) to activate the eagle vision.
- While in Eagle vision mode when player presses any other button the camera is set to normal mode (3<sup>rd</sup> person view)
- If player presses E or any other key again while in eagle vision mode the camera sets back to normal 3<sup>rd</sup> person view.
- Eagle vision is only available when the character is static.
- Eagle vision will freeze characters movement in 3D world

#### Camera properties during Eagle Vision

- Camera will switch from 3<sup>rd</sup> person to 1<sup>st</sup> person view
- Camera will transition towards the head of the character
- Camera will rest in the first person view
- Camera transition will have an offset motion while coming to the resting position from 3<sup>rd</sup> to 1<sup>st</sup> person view
- Reverse motion will happen when switching back from 1<sup>st</sup> to 3<sup>rd</sup> person view.

#### Camera Control

- Player will be able to control the camera with the same control that is used to control 3<sup>rd</sup> person camera
- Camera position in 3D world will be static
- Camera will only have rotation in eagle vision mode.
- Camera will have a 360 degree free rotation while in Eagle vision mode.

### Cinematic Camera System:

Cinematic camera system allows player to view the cinematic scene from different angles. This offers a flexibility to the player to have a better view of characters & environment in Assassin's Creed.

Control of multiple cinematic cameras:

- These cameras are fixed for the cinematic
- Player has to simply click in order to cycle through these different cameras
- Cameras cycle through in a fixed order.



Above image shows an example of the 4 camera angle used to see the cinematic by the player.

### Cinematic Focus Camera

- When a cinematic is playing a layer of symbols is seen on screen
- If player presses the required key the camera will move on to a new subject or object that has been introduced to the scene.
- Introduction of new entity in a cinematic and cinematic focus is panned on this new entity helps explain the importance of the entity in the scene.
- For Example: When Altair is talking to Al-Mualim one of the servants brings an egg shaped object. When the symbols are shown on the screen if player presses the required key then camera switches to the new object that is introduced in the scene.

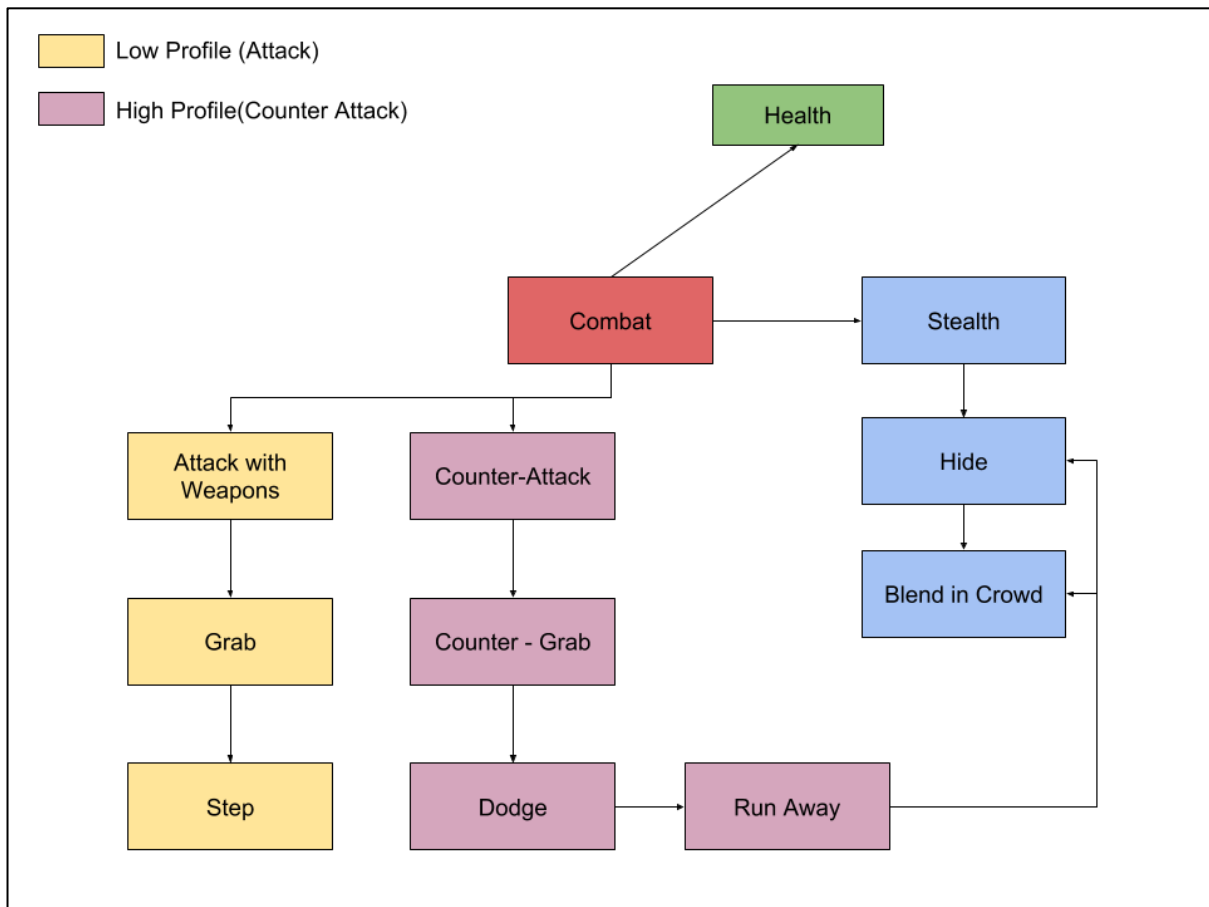
## Combat System

Combat system contains multiple aspects. All these aspects put together form a combat system.

Combat system consist of:

1. Weapons System
2. Health System
3. Fighting techniques
4. Stealth System

All these systems are interconnected and together form the combat system. Stealth is more about avoiding combat. But it can be used when player is critical on their health and has to run away and hide in combat hence can be counted as a counter attack.



Combat system as a whole consist of Attack, Counter attack Health and stealth System.

All these systems consist of multiple actions. Sum of these actions leads to combat in a gameplay.

Freedom for the player to choose what they can do during combat and the degree of freedom they maintain during this combat makes the combat system engaging and fun. Limiting the combat system leads to a very restrictive combat and hence a disappointment for the player.

Hence a combat system cannot be complete without a survival measure taken during the combat.

## Game System Design

### Weapons System:

Player has 4 types of weapons at his/her disposal in Assassin's Creed.

Each weapon has their unique properties. Each weapon has a unique visual style to distinguish them and different stats that define the damage, speed and other properties that the weapon contains.

Weapons player can use in Assassin's Creed:

- Fists
- A Hidden Blade
- Throwing Knives/Short Blade
- A Sword

### Weapons Details:

Fist Properties:

- Fist is the basic weapon a player can use.
- Fist is the default weapon the character is armed
- Fist is not an effective weapon against the opponents
- It can be used by the player during interrogations.
- Fist is a melee weapon
- Using fist as default near guard guarantees that player doesn't fall into suspicion and is attacked by the guards

Controller mapping shows how fist can be selected by the player.

Hidden Blade Properties:

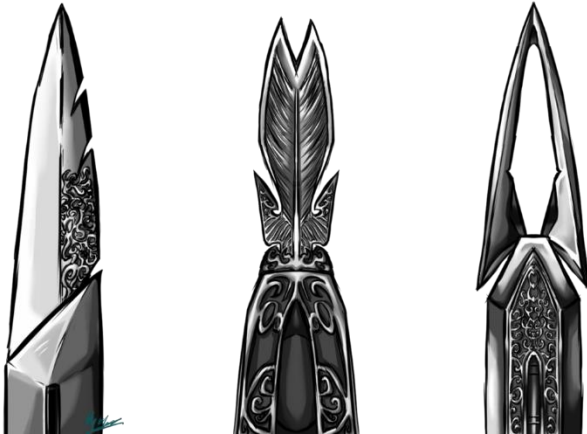
- Hidden blade is a powerful melee weapon
- Hidden blade has a high damage value
- Hidden blade can be used to kill a target in one go
- Hidden blade can be used while chasing an opponent
- Hidden blade is effective against all kind of opponents.

Hidden Blade Art reference: Hidden Blade mechanism reference:

## Game System Design



### Hidden Blade Types:



### Throwing Knives Properties:

- Throwing knife is a ranged weapon
- Throwing knife is effective from a close range
- Throwing knives are fatal
- Throwing knives can be used against all kinds of opponents
- They are effective against the guards and archers that are surveying the area.

## Game System Design

Throwing Knives Example Art reference:



Short Blade Properties:

- Short Blades is effective from a close range
- Short Blades are fatal
- Short Blades can be used against all kinds of opponents
- Short Blade allow the player to fight in a unique fight style.
- Short blades provide the player with unique kill style during a melee attack

Short Blade Art Reference:



Kurdish Jambiya Short Blade

There are multiple short blades used throughout the Assassin's creed series above shown is just one example as a reference art for artist and modellers.

## Game System Design

### Sword Properties:

- Sword is a melee weapon
- Swords are effective from close range
- Swords are useful in most cases
- Swords are fatal
- Swords can be used against all kinds of opponents in close range.
- Swords are effective for counter attacks.

### Sword reference Art:



The sword of Altair

### Weapon Statistics:

Weapon	Damage	Speed	Combo
Sword	5	3	2
Hidden Blade	5	2	N/A
Short Blades	4	4	Unique Kill
Throwing Knives	3	3	N/A
Fist	1	3	N/A

Numbers mentioned above are hypothetical and do not represent the actual damage, speed or combo properties of the weapons found in game.

### Weapon statistics:

#### Damage:

Damage inflicted upon enemy by the weapon.

#### Speed:

Speed with which the weapon can be struck.

## Game System Design

Combo:

Number of combo attack that can be performed while fighting with this weapon.

### Health System

Assassin's Creed health system is called synchronization. Player can lose health if they perform a wrong action. The Health will gain overtime when player is not in combat mode.

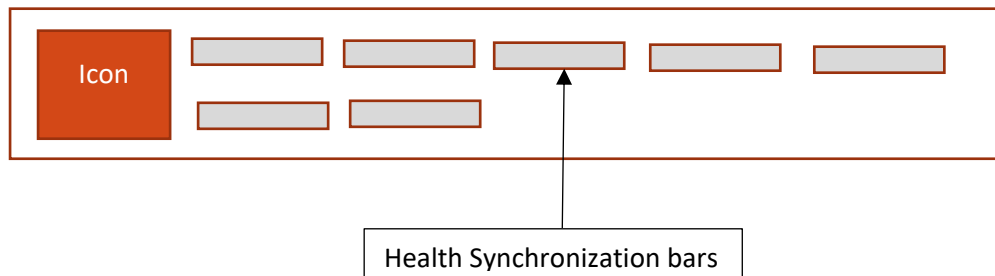
Player loses health:

- If they harm innocent citizen
- If they incur damage during combat
- If the jump from greater height

Health Parameters:

- Player has X amount of health when they start the game
- When player saves and quits the game in this case the health is also saved.
- Player loses health when they incur damage
- When player loses complete health (synchronization) they are taken back to animus from where they can restart memory block to continue playing
- Health points are flexible as per each memory block this will help designer to scale challenge and set difficulty.
- Both player and enemies have health system
- Health is displayed only for the player and not the enemy.

Health System representation:



Health & Level up System:

- Health and player level up are tied together.
- As the player progresses through game and levels up the health parameter also increases.
- Each time a memory block is reset player will start with full health which matches the current level up parameters.

Table below shows how Player XP level, Required XP points and Health Points are interconnected.

As player completes missions they gain XP points. As the XP points increase the Health points increase. More health points enable the player to survive the missions longer

Table below is a hypothetical XP/Health points table this table doesn't represent the numbers in Assassin's Creed Game and is just an example.

## Game System Design

Player XP Level	XP Points	Health Points
1	100	500
2	200	1000
3	300	1500
4	400	2000
5	500	2500
6	600	3000
7	700	3500
8	800	4000
9	900	4500
10	1000	5000
11	1100	5500
12	1200	6000
13	1300	6500
14	1400	7000
15	1500	7500

### Fighting System:

Player has to use Low profile and high profile during combat.

Table below shows use of High and low profile controls:

Button (PC controls)	Low Profile	High Profile
LMB	Attack	Counter Attack
Shift	Grab	Counter Grab
Spacebar	Step	Dodge

#### Low Profile Controls:

- Player can Attack their opponent in low profile
- They can grab their opponent in low profile
- They can step towards the opponent as an aggressive move in a low profile attack

#### High Profile controls:

- When player activates the high profile same controls are used as counter offensive
- Player can counter the incoming attack.
- They can counter grab the opponent.
- They can dodge the incoming attack.

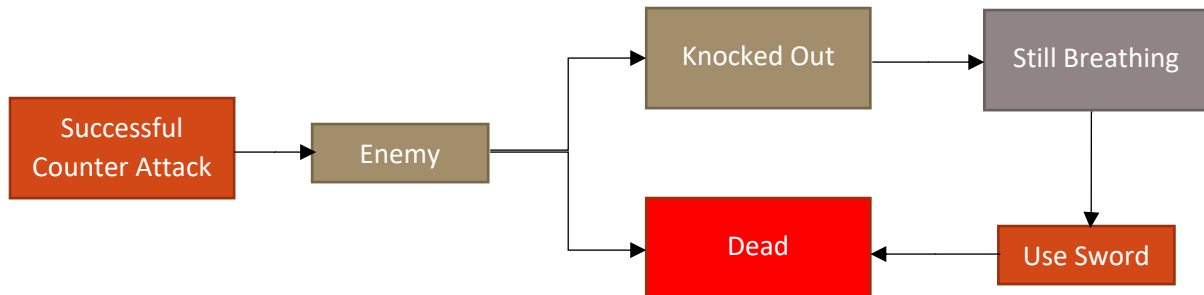
#### Combo attacks with sword:

- Player can perform combo attack with sword.
- Combo attack consist of multiple strikes
- Combo attack can end with a strike killing an enemy.

## Game System Design

### Counter Attack:

- This is the most useful technique during fighting
- Counter attack is activated when high profile is activated
- Player has to simply push LMB button in high profile



- When player performs a successful counter attack they can either knock out the enemy or Kill the enemy
- If player has knocked out the enemy and they are still breathing then they can use the sword to kill the enemy

### Grab Breaks:

- Grab break is a defensive technique
- This allows the player to intercept an enemy grab.

### Defence Break:

- An defensive technique that allows player to break enemy guard
- Player has to use a spacebar (Step) and then an attack to use the defence break

### Dodge an Attack:

- Dodge attack is a defensive technique the player can use to dodge an incoming attack.
- Player has to activate high profile to use dodge

## Stealth System

- Stealth system consist of Hiding and blending with the crowd.
- Stealth is a counter measure for survival in the game.
- When player is injured and their health is critical they can use stealth action of hiding or blending.
- Stealth system can be used to assassinate a target without alerting NPC.

Stealth system in combat can be used to survive an attack from over whelming opponents.

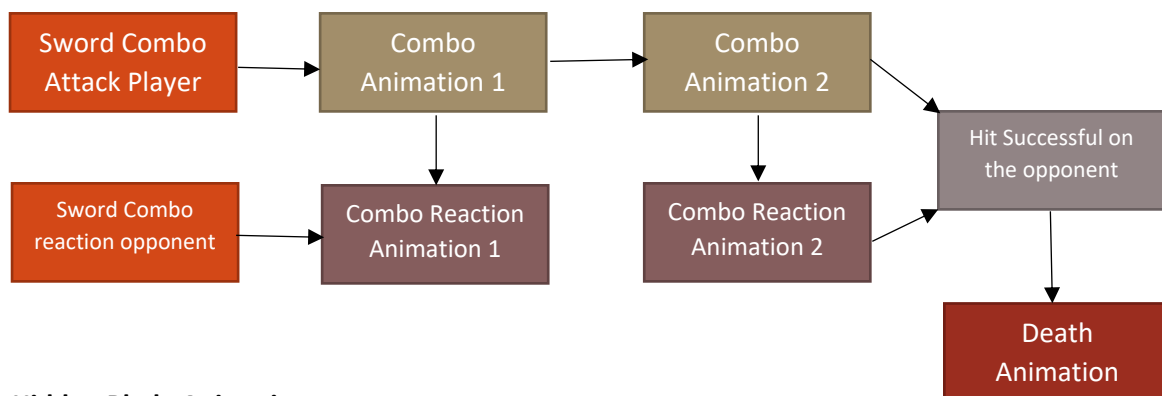
### Fight Combo & Animation

- Each weapon will have its own unique action & reaction animation
- Ranged weapon will have single animation
- Whereas Melee weapon like sword will have multiple combo animations
- Each animation will be accompanied by reaction animation for the opponent
- Actions like Grab Break, Defence break and Dodge an attack will have one animation and not a combo
- Animations for the combat system will have Action and Reaction animation.

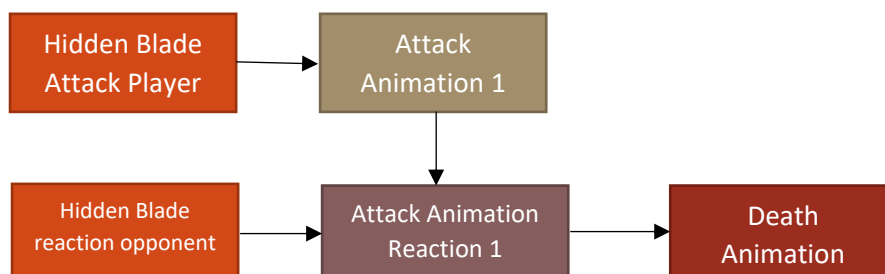
### Attack Animations:

#### Sword Combo Attacks

- When player keeps pressing attack button after the first hit a combo is executed then the second hit combo.
- A sword will have 2 combo attack animations
- When player presses & holds attack button and the releases then a heavy hit animation will be played.
- Heavy hit animation will be different from the normal hit combo it will feel more effective
- Sword combo animation will contain 2 consecutive strikes

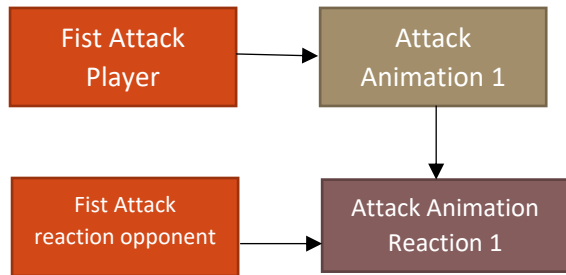


#### Hidden Blade Animation:

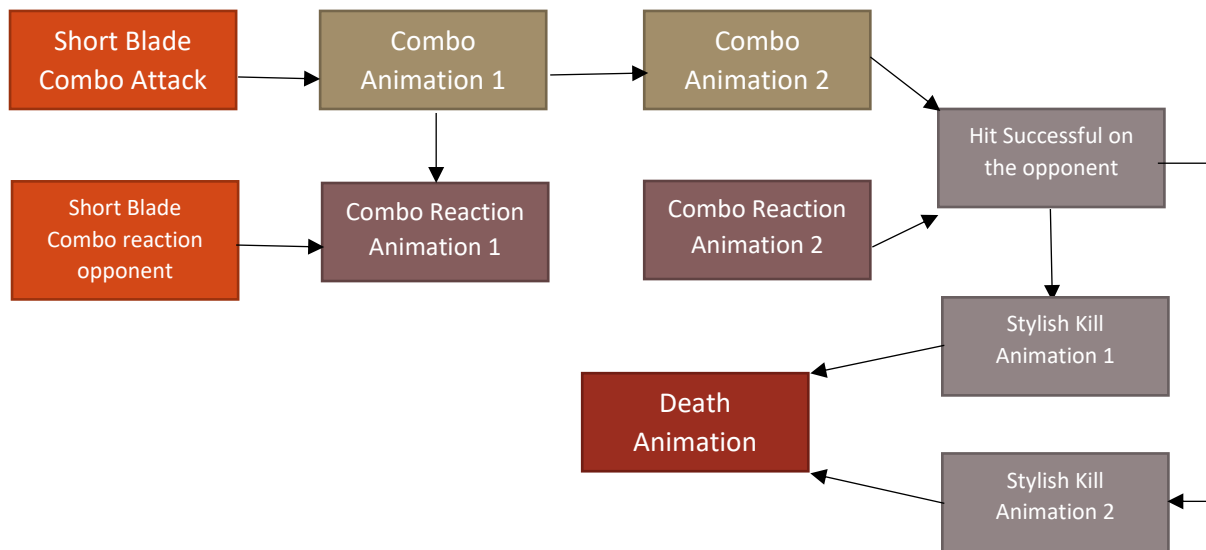


## Game System Design

### Fist Attack Animation:

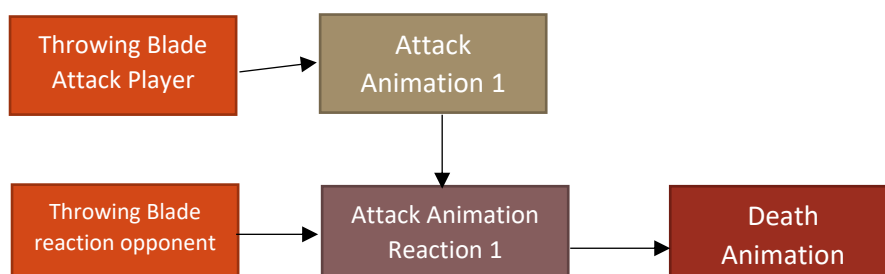


### Short Blade Combo Kills:



- Short blade combos are similar to sword combos.
- Short blade has unique stylish kill animations
- When combo is successful and opponent gets hit a stylish animation is played leading to death of the opponent

### Throwing Blade



## Game System Design

### Attack Animation Structuring:

- An attack animation frames will be set as per animation style and requirement of the action
- Attack animation will have three sections
- Start section will contain the action start (Start-up Frames)
- Active frame will contain the hit or collision section
- Recovery frame will contain the recovery action



- Each combo attack will have same number of frame data to avoid frame data advantage
- This will help the action to remain consistent
- A reaction animation can be the same as the action animation in respect of number of frames
- This will allow the character to do complete recovery and then perform the second combo hit.
- In case of a single attack animation same rules will not apply as death animation will play once the attack is successful

## Assassin's Creed Navigation system

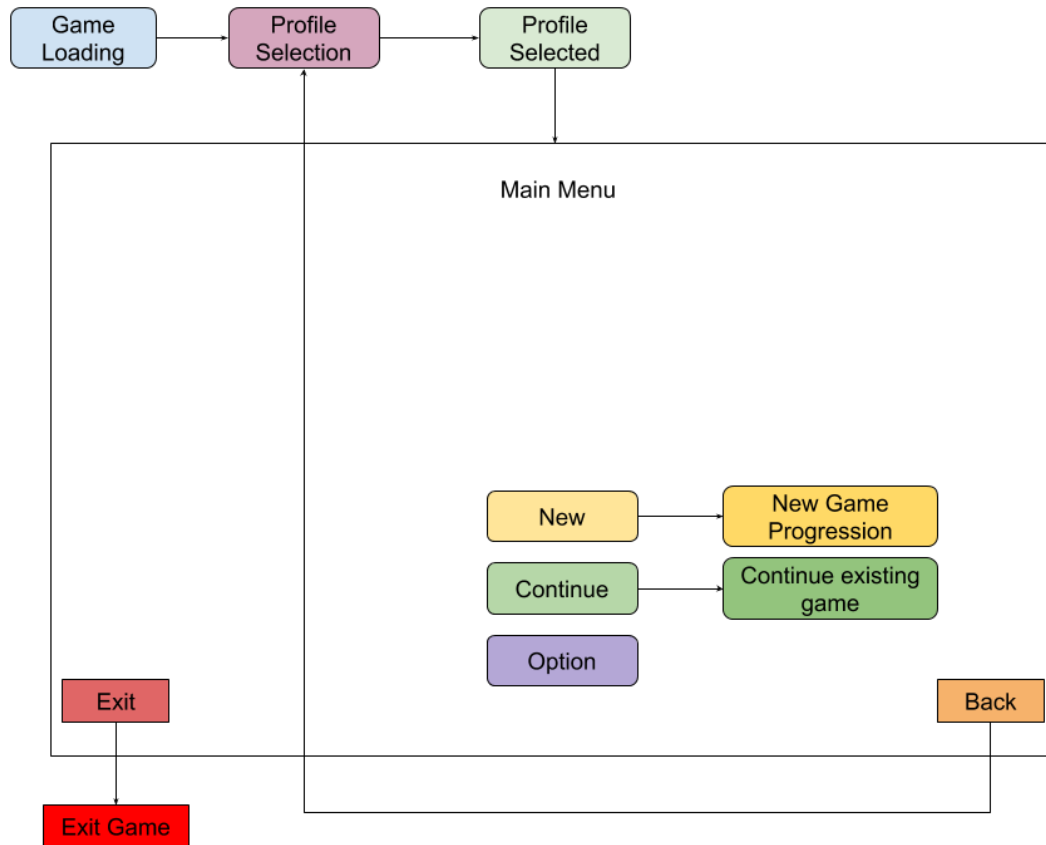
Assassin's creed navigation system can be divided into subsets:

1. Menu Navigation
2. In Game Navigation system

### Menu Navigation System

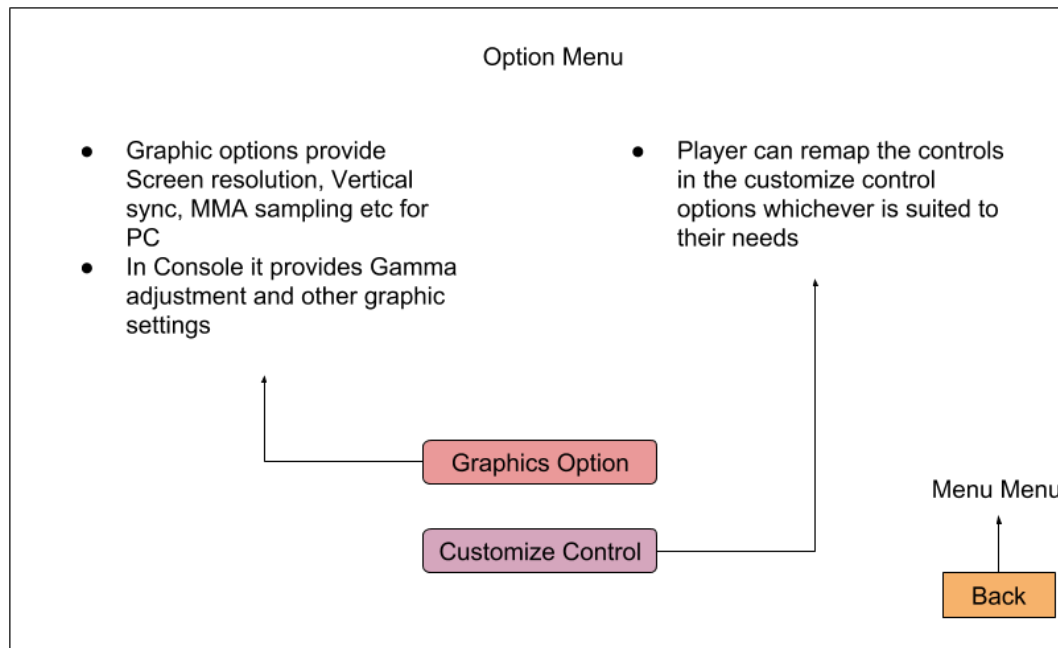
Menu Navigation is responsible for the navigation from the main menu to the game play.

Below is the Menu Navigation system:



- When player starts the game they have to create a profile
- Once profile is created it gets saved on the disk and player's game progression and options are stored in this profile.
- When profile is loaded player is taken to the main menu
- In Main menu player has an option to start a new game for the first time
- When player comes back to the screen for the second they get an option to continue the game.
- After the second visit player is given both options to continue the game or start a new game.
- Option button is provided where player can change device settings
- Exit button exits the game.
- Back button takes player back to profile screen

Image below describes the function of the option menu



### Animus Machine

Animus is the machine that simulates the memory of its user. Using this machine player will be able to access past of their ancestors. Animus is a part of the game.

Animus is built and sold by Abstergo Industries.

Player can only enter the assassin's creed world using the Animus.

Animus laboratory consist of rest room for players character a meeting room and the Lab itself.

Player can travel in the room perform basic action of interacting with objects but the character will not be able to fight and do other actions unless the story permits.

### Animus Menu

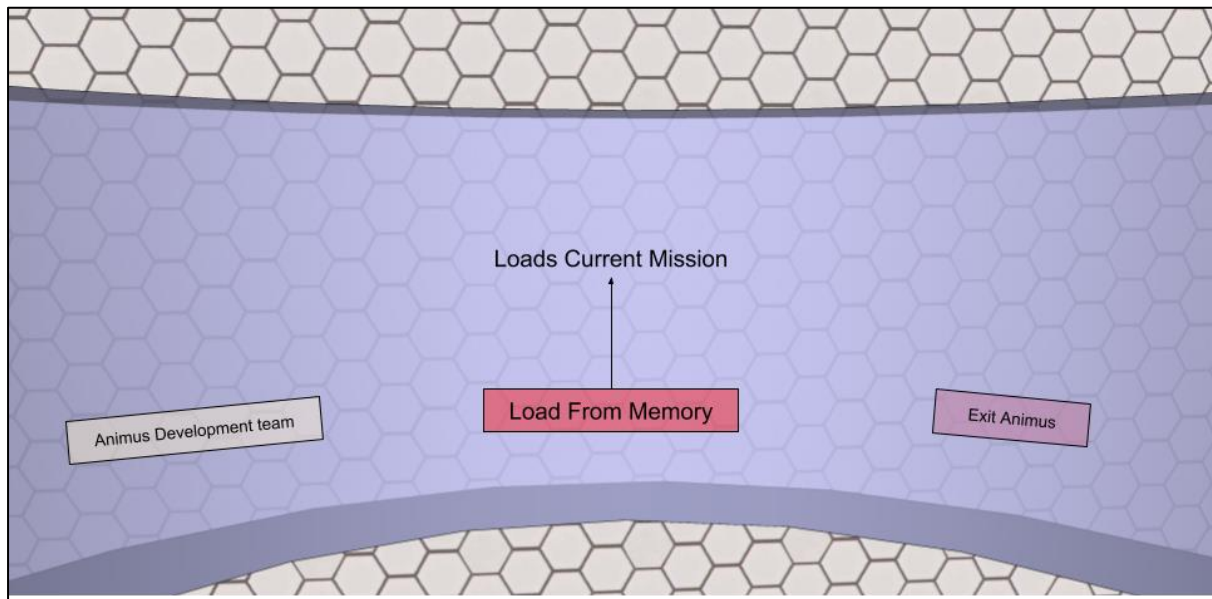
Animus menu is activated when player's character interacts with the Animus machine in the lab. Once in the animus machine the camera is switched to first person view.

From this view player is exposed to the animus menu which appears in front of them in semi-circular form.

Menu properties:

- Player can only tilt their head 180 degrees inside the menu
- A semi-transparent screen appears
- Player is given 3 options
- 1- Credits for animus development team, Continue load memory, Exit
- Continue with memory block resumes the mission player was playing
- Exit button deactivates the machine and player can move around in the lab.

Animus First person view depiction:



- Player can use mouse or gamepad to select the buttons
- Upon selecting the desired option player can enter current mission.

### In Game navigation

In game navigations guides the player to their destination in 3D world.

In- Game Navigation:

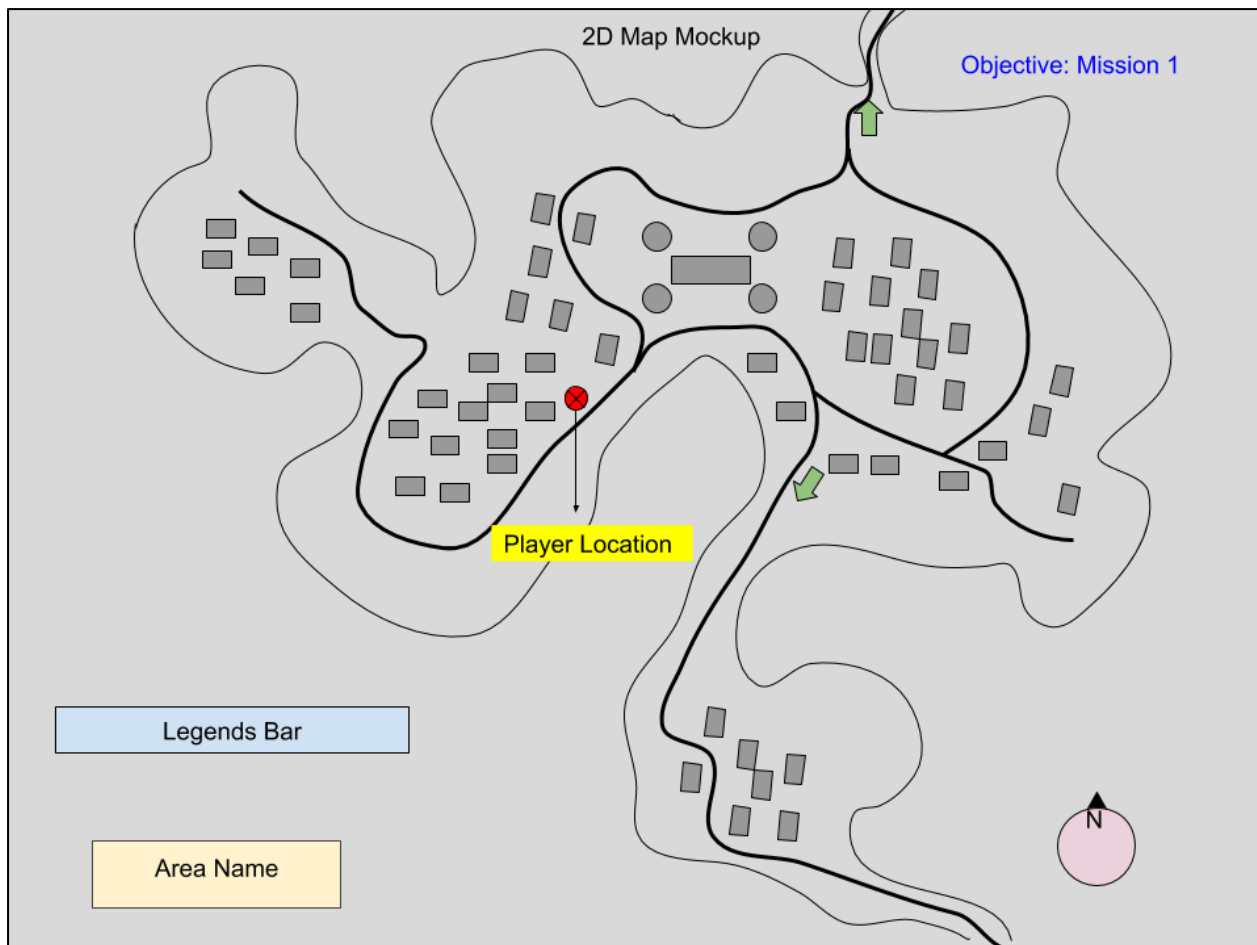
- World Map
- Compass
- Clues and markers imbedded into Game environment
- Cinematic directions

Above are the mentioned ways the player can navigate the 3D world.

### World map

- Most efficient way of navigating the 3D world the player is currently inside.
- World map is mapped to the buttons mentioned in the Controls MappingMap Controls
- World map is a 2D overlay screen that pops up on the screen
- World map is the layout of the current mission world the player is playing
- World map is a top down view of the 3D world without terrain and just outline.
- World map contains the points of interests with displayed icons.
- Each Icon represents area of interest or an information regarding the mission

## 2D Map Mock-up



2D Map Mock up is an overview of how the map screen of the game would look like.

The map will have more information like objectives, places of interest, save a citizen, tower for scouting the area etc.

### Map Legends bar:

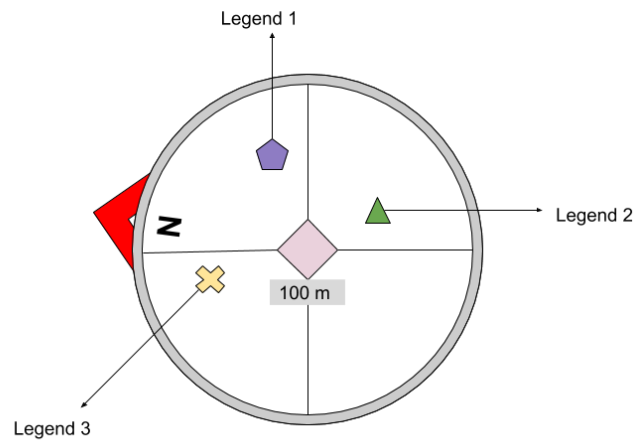
- Map Legends bar opens an overlay with legends information
- Map legends contain icons and name of the icon
- They help player to identify and navigate on the map.
- Map displays different icons like City, kingdom, pick pocket, target etc.
- Player can use these legends to understand track and execute the required result.
- Major navigation done by the player will be using the game map.

### Compass:

- There will be a compass overlay seen on the game screen
- This will help the player navigate to the point of interest without opening the map.
- A compass overlay that is displayed on the screen shows the north direction as well as the markers for legends
- The compass helps the player to navigate in the 3D world during gameplay

## Game System Design

### Compass Mock Up:



- Compass is positioned on the bottom right of the screen
- It will always point at the north direction
- Other points of interest will also be shown on the compass
- Compass will show distance between the player and the current selected marker
- Position of the compass will be fixed
- It will disappear during a cut scene and re appear once the scene ends.

### Clues and Markers embedded in Game Environment

- During creation of levels and game environment markers and clues can be embedded
- Places that are accessible for the player can have a different texture
- The wooden beams that stand out than other structures
- While riding a horse there are milestones that show the direction
- Flags planted along the way that show the path to the player
- Brick Path road that ends at the border of town indicating limits of the town
- Eagle circling the tower that player can use to scout
- NPC pointing out in certain direction to the player
- Wall and cliff marked with white paint or different texture that stand out indicating that player can interact and climb or jump.

## Game System Design

Example of an environment marker in Assassin's Creed



Milestone showing direction



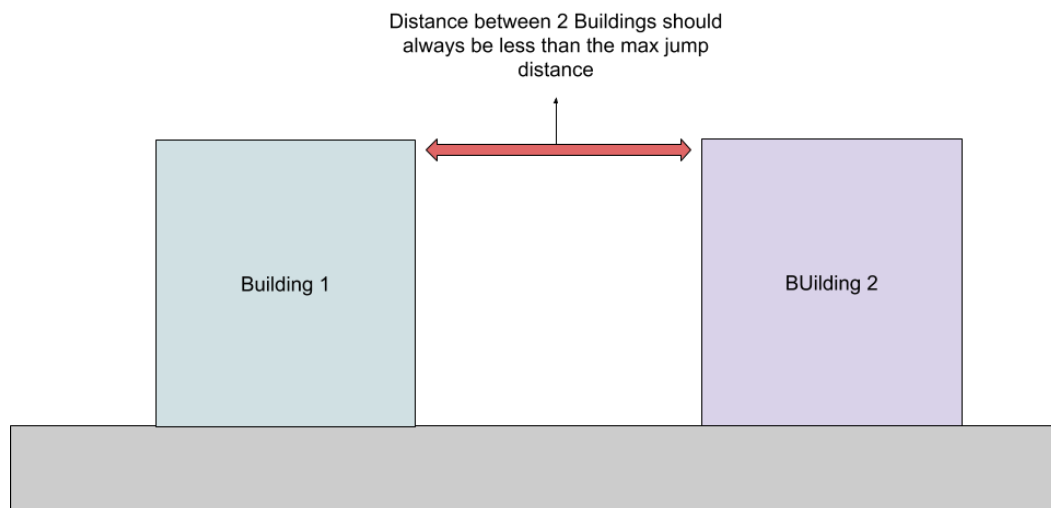
In this scenario player is told to follow the flag and rope leading the character to the tower. One of the environment marker example.

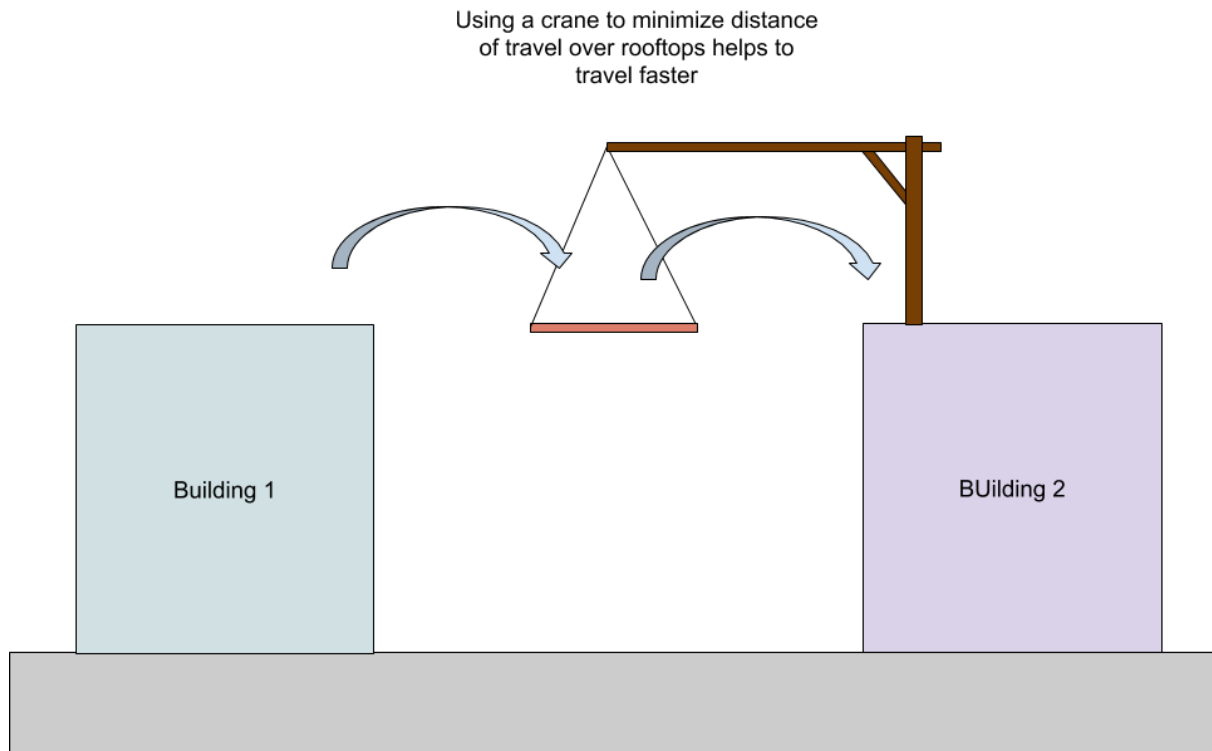
### Cinematic Directions

- Cinematic directions are simple camera panning action
- When player reaches certain destination the cinematic camera gets activated and pans a view of a building or a place where that player has to visit
- For the first time when player reaches the Assassin's Creed Bureau the camera pans and shows view of the castle
- When player reaches Jerusalem the camera pans and shows view of the city.
- Cinematic direction is simple navigation nudge to the player but it has two effects
- Player knows where they have to go
- It introduces the landscape and sheer "awesome" moment to the player thus increasing engagement.

### Object Distancing & Structure:

- Distance between the buildings and objects should not exceed maximum jump distance of the character
- If the distance between two buildings is more than the jump height then an object of relevance must be placed between the buildings
- Every building structure made for Assassin's Creed must have multiple sections where it should be easy for the player to climb.
- For example if a building is 4 sided at least 3 sides should be modelled in such a way that play can climb over them.
- Climbing structure is one of the most important part of the game and level design should be such that player can climb and easily navigate through the city





- One of the ingenious ways assassin's creed has shortened travel between buildings is introducing objects like crane, wooden beams, rooftop extension that get converted into shades on street.
- These are the basic elements assassin's creed has done to make navigation easier for the player over rooftops.
- These are simple elements that are observed in a city and the level designers have used it as an advantage to the player to navigate.

#### Auto balancing for Navigation & Travel:

- There are areas where auto balancing for navigation kicks in
- When player starts walking on a wooden beam or a wall.
- Auto balancing system gets activated.
- This helps the player to focus on the getting from point A to B and not fall and start all over again
- Same system helps the player to escape the opponent or fight standing on the wooden beam or a thick wall

Player can navigate between cities and towns using a horse. Scouting areas in between for side mission or just for exploring.

\_\_\_\_\_ **The End** \_\_\_\_\_