

Game development on iOS

by Roman Mishchenko

Keynote



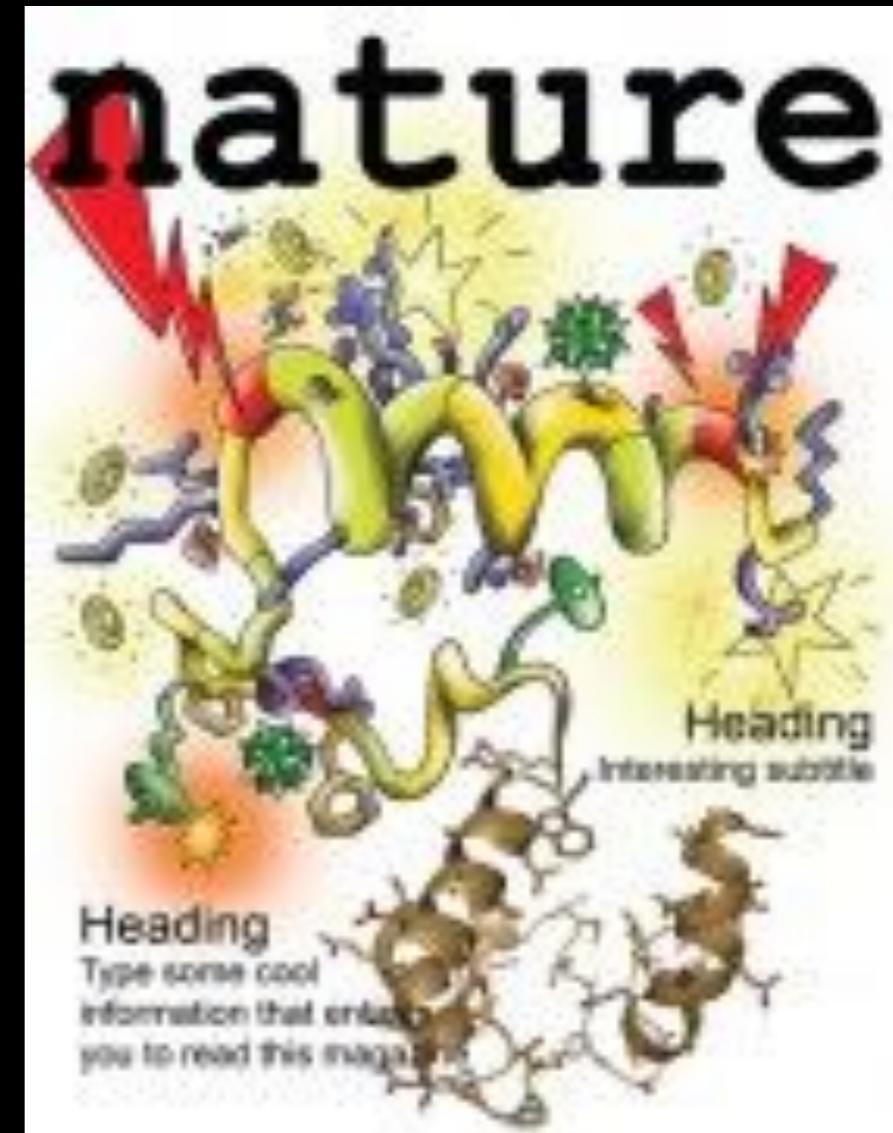
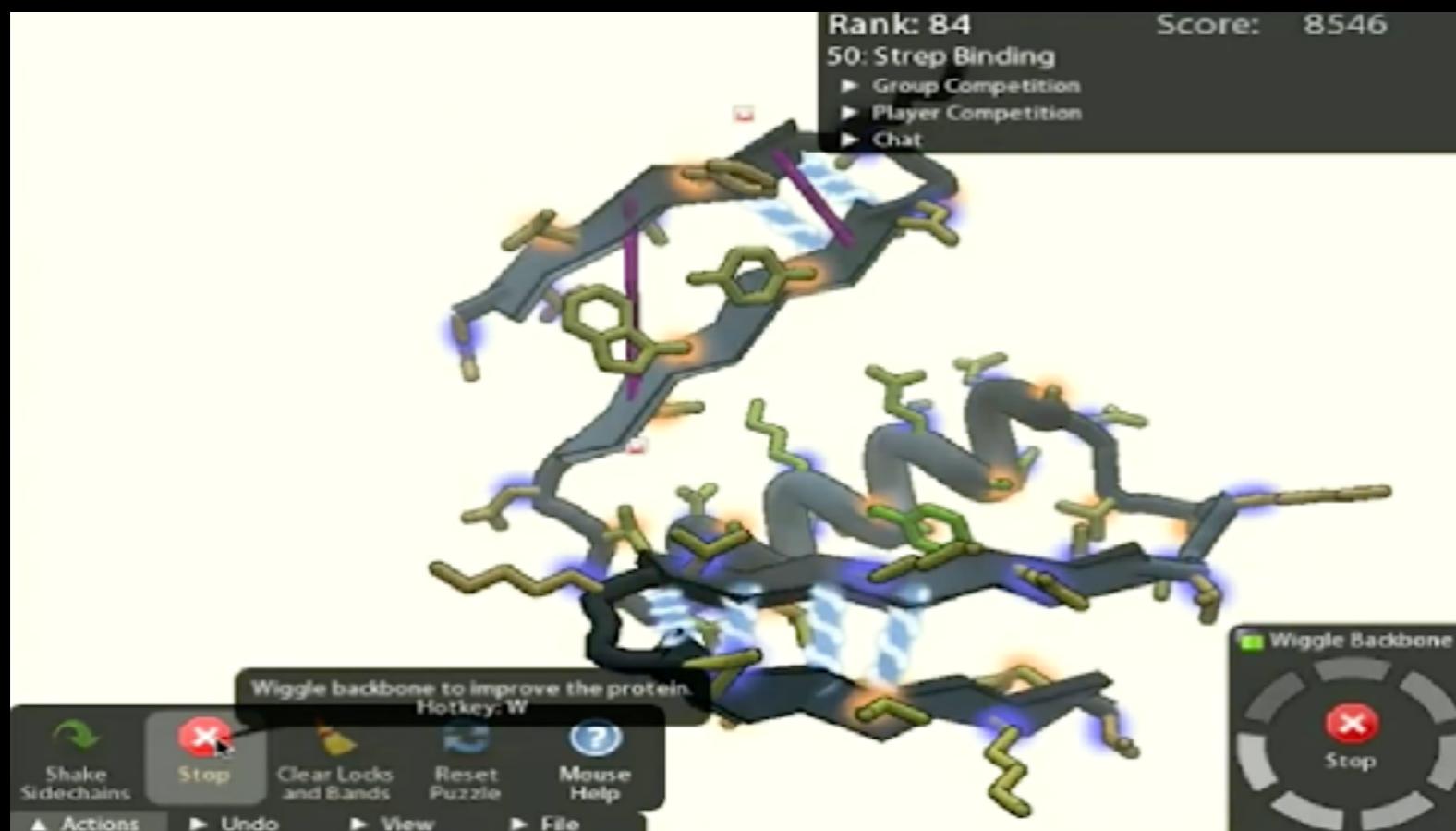
- **Why should we develop games (on iOS)**
- **What instruments does Apple provide**
- **How can we use game development when we don't develop a game**

Why should we develop games



Useful

Foldit



Rank: 84

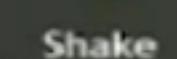
Score: 8885

50: Strep Binding

- Group Competition
- ▼ Player Competition

78 kriox
79 MachFour
80 jonhughes
81 jamesv
82 crees
83 Benj
84 kathleen
85 wccarrington

► Chat



Shake
Side-chains



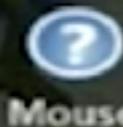
Wiggle
Backbone



Clear Locks
and Bands



Reset
Puzzle



Mouse
Help

▲ Actions

► Undo

► View

► File

Pull Tool

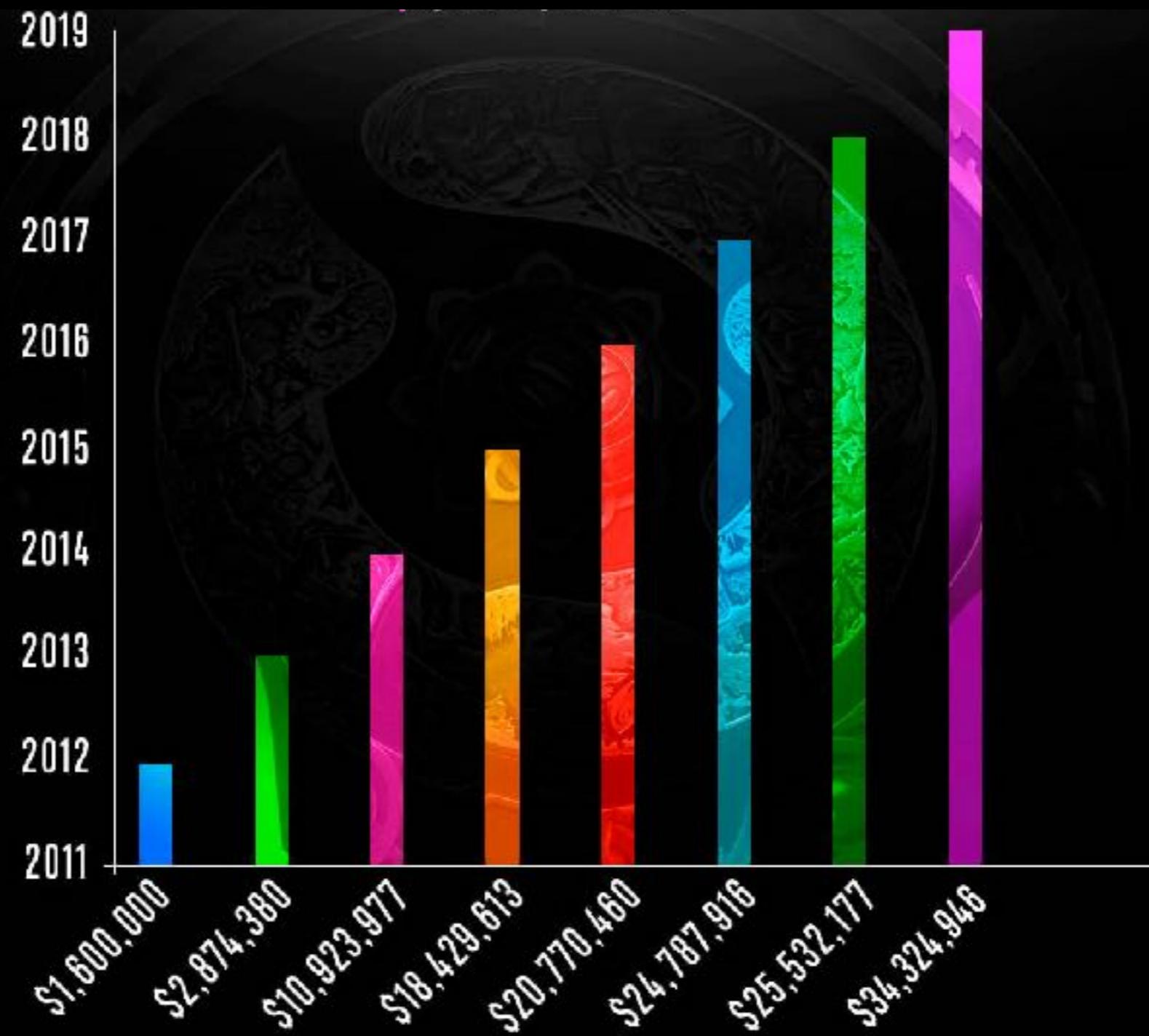
Art



Money



Prize Pool by year



THIRD QUARTER 2019 SEGMENT RESULTS

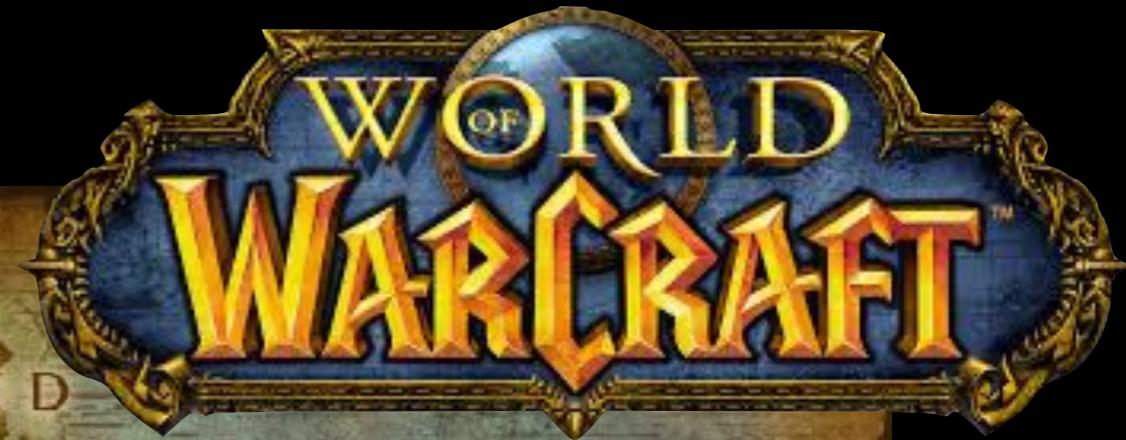
	ACTIVISION	BLIZZARD ENTERTAINMENT	KING
Q3 Segment Net Revenues:	\$209M	\$394M	\$500M
Q3 Segment Operating Income:	\$26M 12% operating margin	\$74M 19% operating margin	\$194M 39% operating margin
Key Highlights:	<ul style="list-style-type: none">Key contributors were Call of Duty Black Ops 4 in-game and upfront revenues and ongoing sales of Crash Team Racing: Nitro-FueledSegment revenues lower Y/Y against a comparable that included the World of Warcraft: Battle for Azeroth expansion	<ul style="list-style-type: none">Strong World of Warcraft Classic performance in the quarterSegment revenues lower Y/Y against a comparable that included the World of Warcraft: Battle for Azeroth expansion	<ul style="list-style-type: none">Candy Crush franchise revenues grew Y/Y with the ads business almost doubling over the same periodSegment revenues roughly flat Y/Y and Q/Q

Activision

CALL OF DUTY



Blizzard



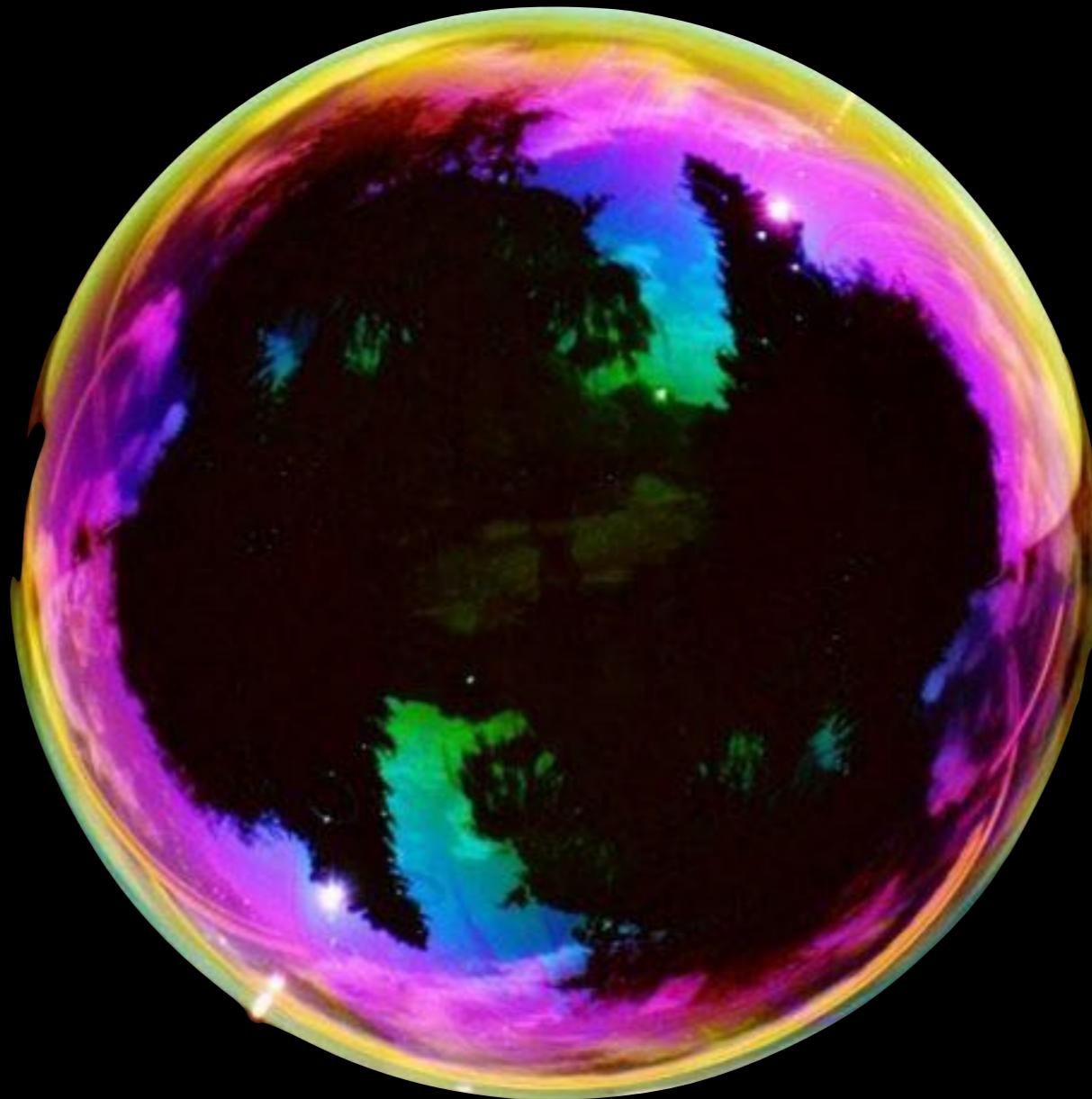
King



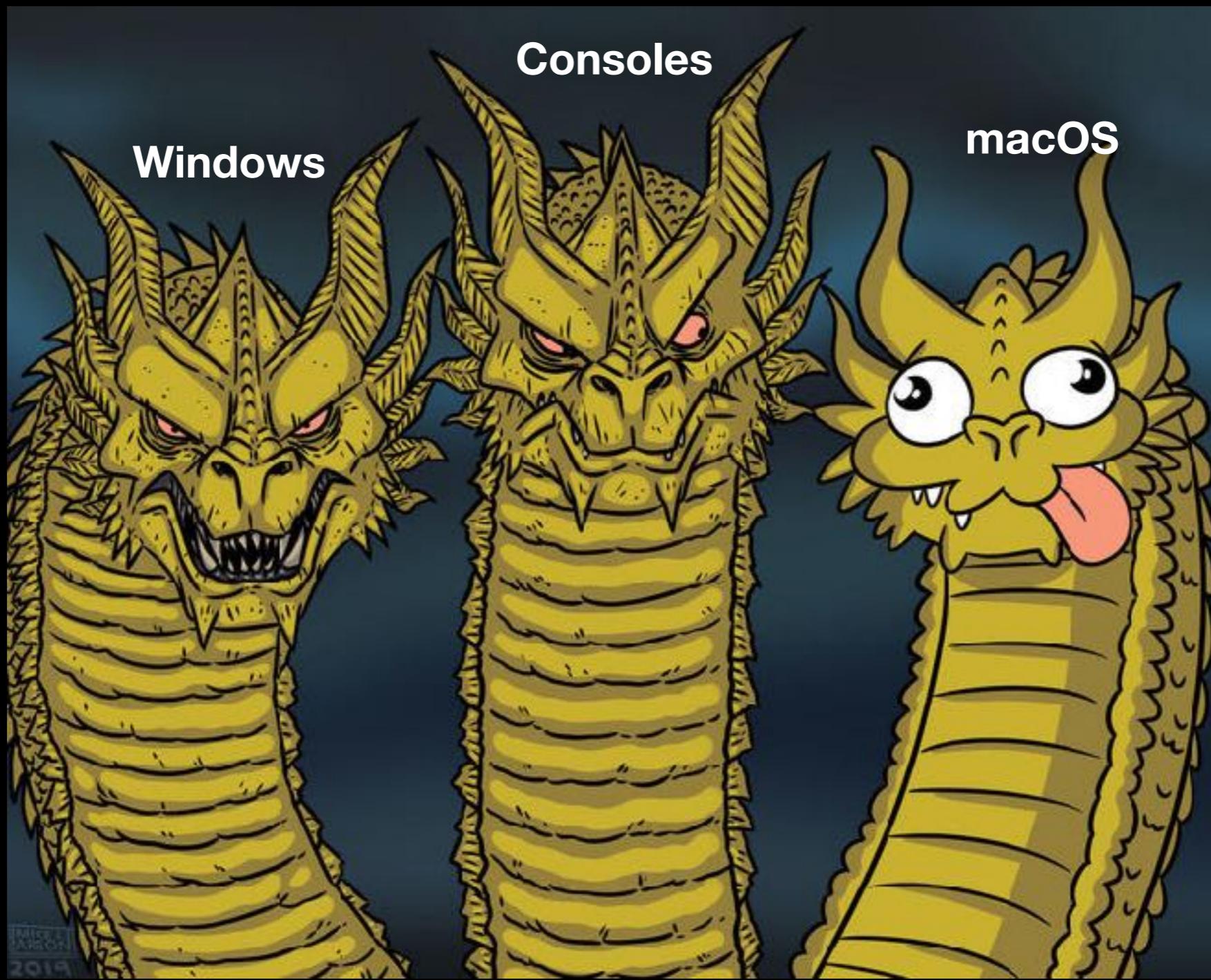
However



Game Bubble



What about Mac?



©Mike Searcy
2019

What instruments does Apple provide



Metal

Maximize the graphics and compute potential of your games with Metal, which provides the best access to the GPU on iOS, macOS, and tvOS.

[Learn more about Metal >](#)



SceneKit

Use this fully featured high-level graphics framework to create 3D animated scenes and effects in your games.

[Learn more about SceneKit >](#)



SpriteKit

With SpriteKit, it's easy to create high-performance, power-efficient 2D games.

[Learn more about SpriteKit >](#)



ReplayKit

Enable players to share gameplay recordings or broadcast live games to players and viewers online with this easy-to-use framework.

[Learn more about ReplayKit >](#)



GameplayKit

This framework provides a collection of essential tools and techniques used to implement modern gameplay algorithms.

[Learn more about GameplayKit >](#)



Model I/O

Integrate physically-based materials, models, and lighting for SceneKit, GameplayKit, and Metal with Model I/O.

[Learn more about Model I/O >](#)



Game Center

Take advantage of Game Center, Apple's social gaming network. Gamers can track their best scores on a leaderboard, compare their achievements, and start a multiplayer game through auto-matching.

[Learn more about Game Center >](#)



Game Controller

Integrate your games with MFi game controllers and take advantage of other modes of input. Learn how to add support for physical D-pads, buttons, triggers, joysticks, and more.

[Game Controller Programming Guide >](#)

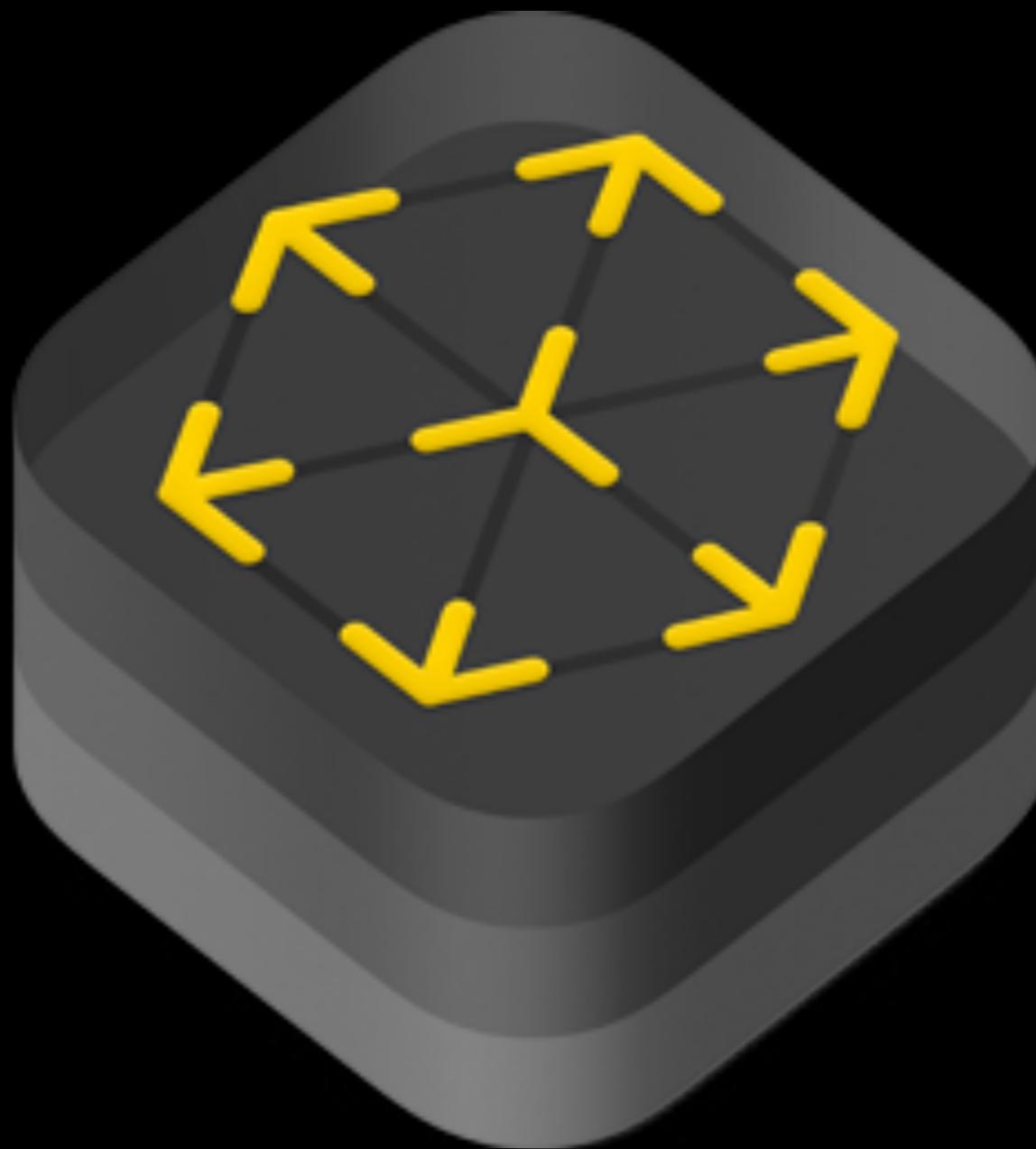


On-Demand Resources

Create smaller app bundles, enable faster downloads, and add up to 20 GB of additional content hosted on the App Store.

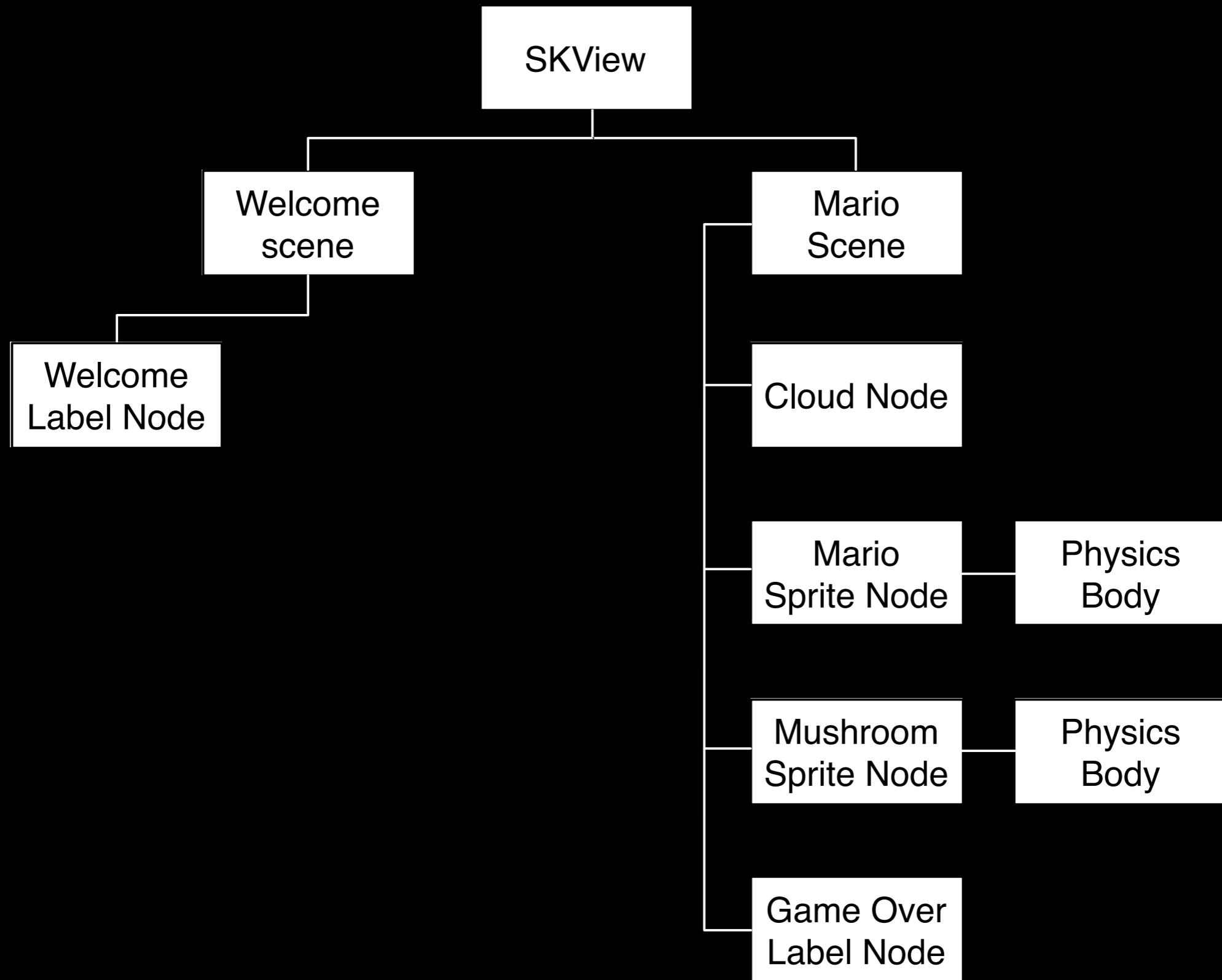
[On-Demand Resources Guide >](#)

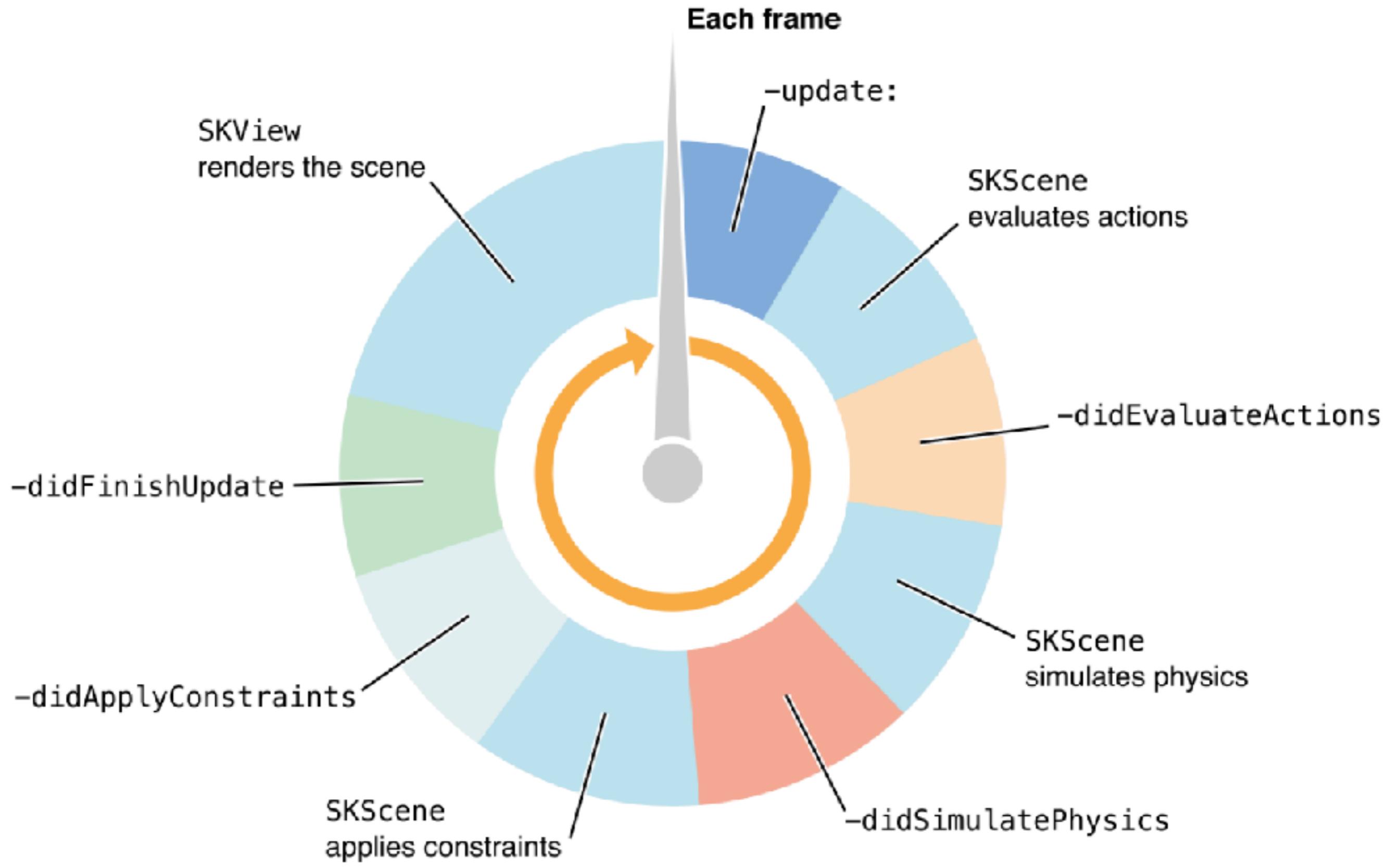
ARKit



SpriteKit







Move Action

Scale Action

AnimateWithTextures Action



→ Move Action

→ MoveTo Action

□ Scale Action

□ ScaleTo Action

↔ ResizeTo Action

→ ResizeToWidth Action

↑ ResizeToHeight Action

↔ Resize Action

↻ Rotate Action

↺ RotateToAngle Action

○ FadeOut Action

○ FadeIn Action

○ Hide Action

○ Unhide Action

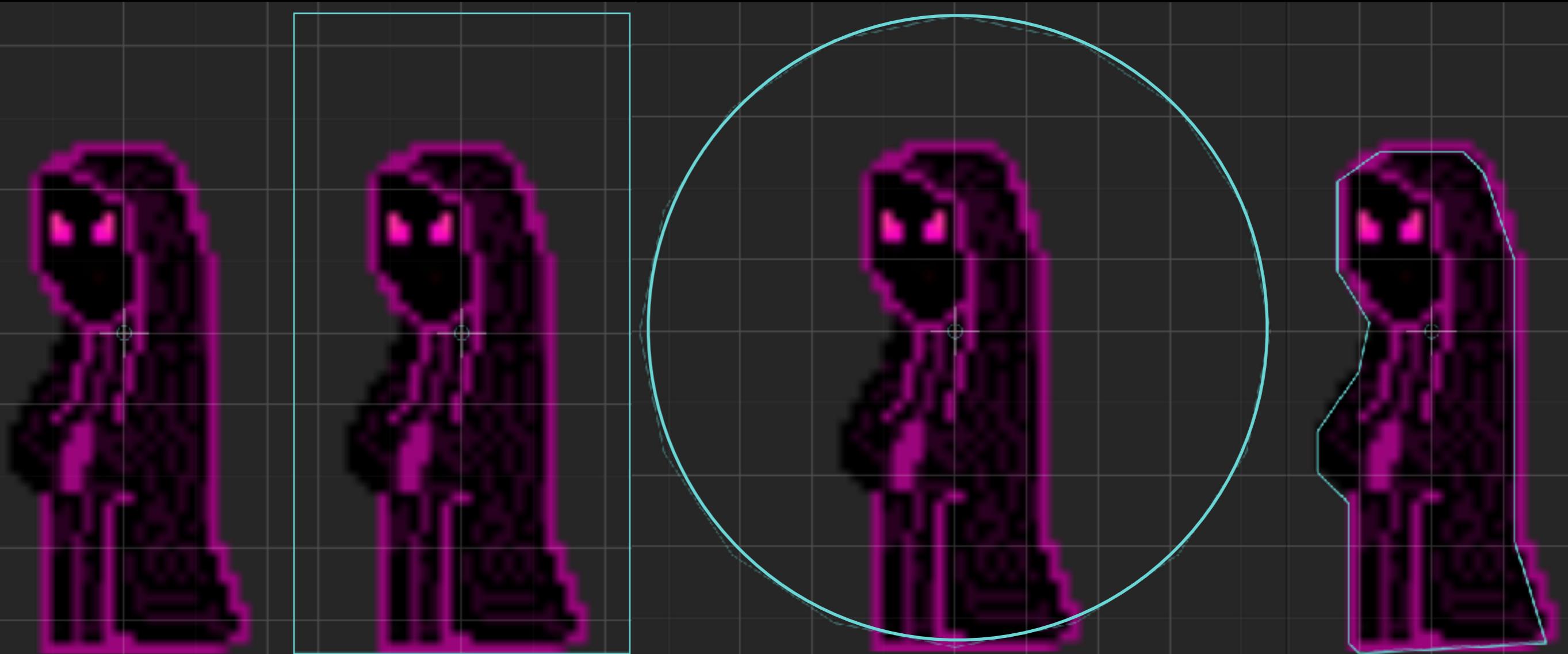
↑ FadeAlphaTo Action

🔊 PlaySoundFileNamed Action



AnimateWithTextures Action

Physic Body Types



Physics Definition

Body Type **Bounding rectangle** 

Dynamic
 Allows Rotation
 Pinned
 Affected By Gravity

- 0.2 + - 0.2 +
Friction Restitution

- 0.1 + - 0.1 +
Lin. Damping Ang. Damping

0,444444477558136
Mass

Initial Velocity - 0 + - 0 +
DX DY

Category Mask 4294967295

Collision Mask 4294967295

Field Mask 4294967295

Contact Mask 0

Custom Shader 



How can we use game development when we don't develop a game

Gamification



Killers

Achievers

Socializers

Explorers

Achievers



Killers



Socializers



Explorers

Onyx Blade

Greatsword

Standard/Thrust

Elfriede's Blackflame

FP cost 19 (-/-)

Weight 9.0

Attack power

Physical 80 + 24

Magic 0

Fire 0

Lightning 0

Dark 115 - 46

Critical 100

Additional effects

0 0 0

Attribute bonus

E E D D

Attribute requirement

14 12 15 15



Onyx Blade



Elfriede, the eldest amongst her sisters and leader of the Sable Church, bestowed this sword to her knight.

Only, the sword was a farewell gift, and acceptance signified the knight's resignation from Elfriede's service.

Skill: Elfriede's Blackflame
Enwreathe blade with blackflame, born of the similarly-hued flame that smolders within her.

Progress

Special Events

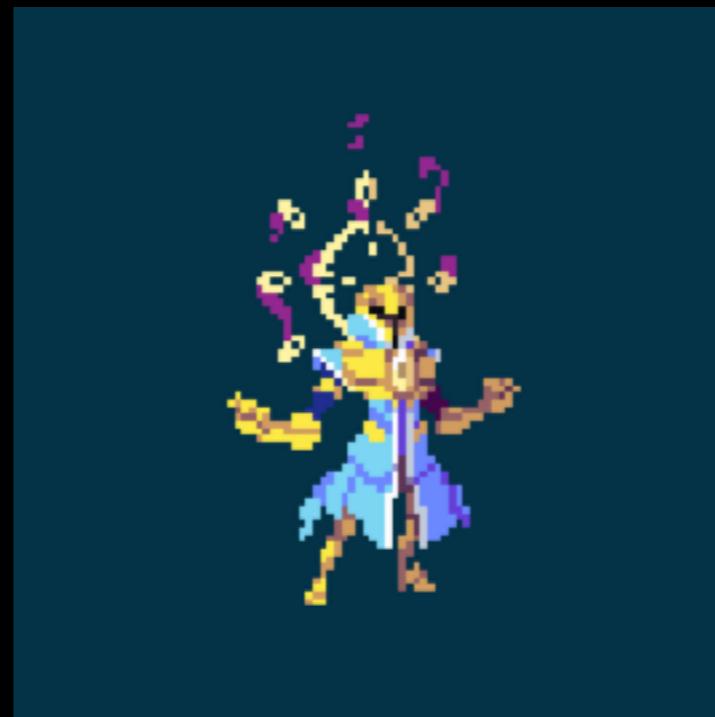
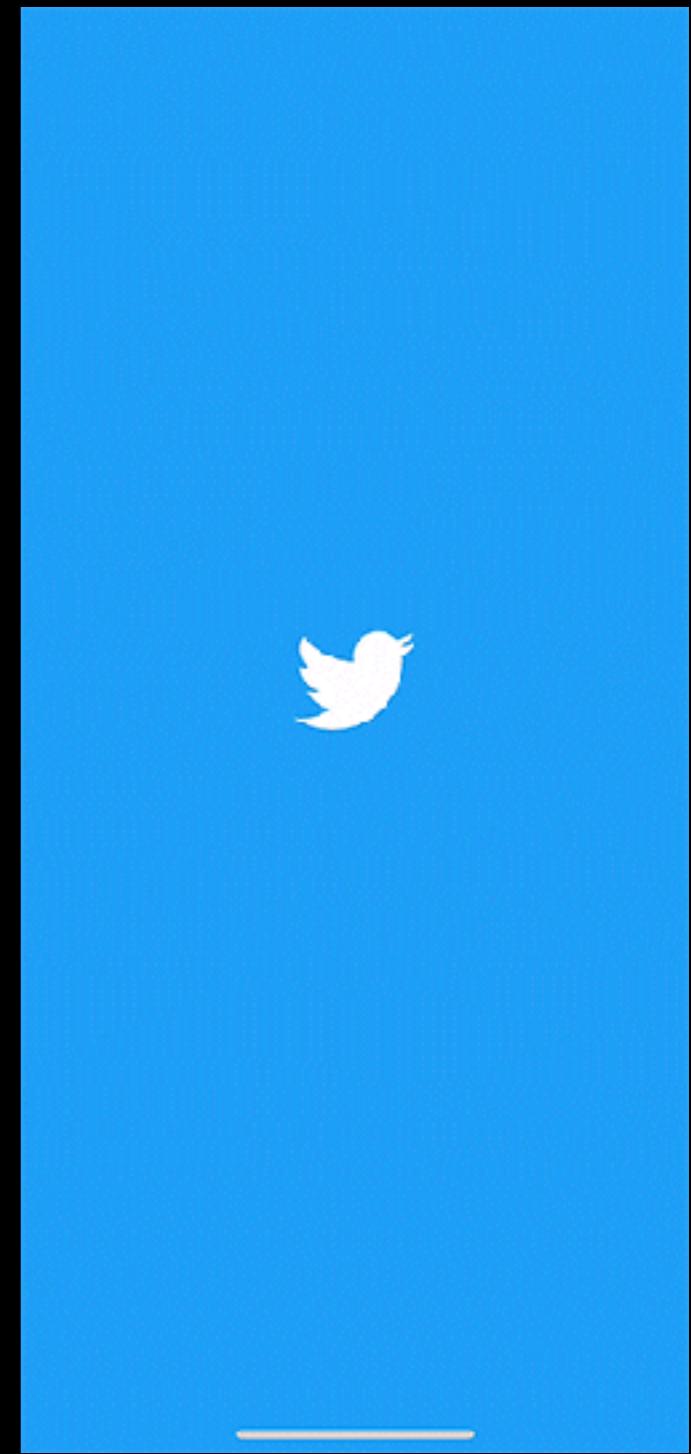
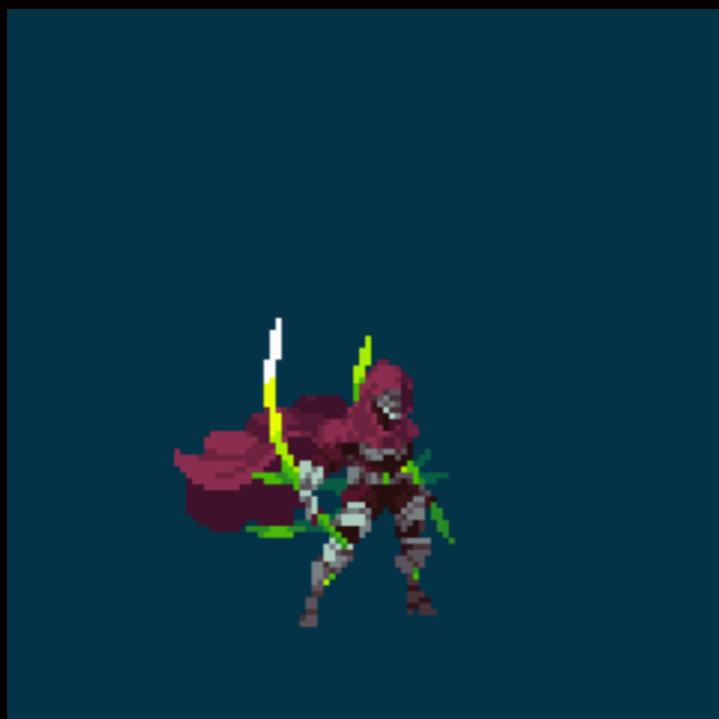
Competitions

Leaderboards

Hidden Content

EveryDay Reward

Animation with Gaming Tools



```
protocol UIViewControllerDelegate {
    func transitionToView()
}
```

```
class GameView : SKView {
    var myDelegate : UIViewControllerDelegate?
}
```

```
import UIKit
import SpriteKit
class ViewController: UIViewController, UIViewControllerDelegate {

    @IBAction func transition(_ sender: Any) {
        self.view = GameView()
        let gameScene = SKScene(fileNamed: "Scene")!

        if let view = self.view as? GameView {
            view.myDelegate = self
            view.presentScene(gameScene)
        }
    }

    func transitionToView() {
        performSegue(withIdentifier: "ShowCat", sender: self)
    }
}
```

Show cat

```
let loadSize = CGSize(width: width/2, height: width/2)
let loadSprite = SKSpriteNode(color: .white, size: loadSize)
loadSprite.position = CGPoint(x: 0, y: 0)
addChild(loadSprite)

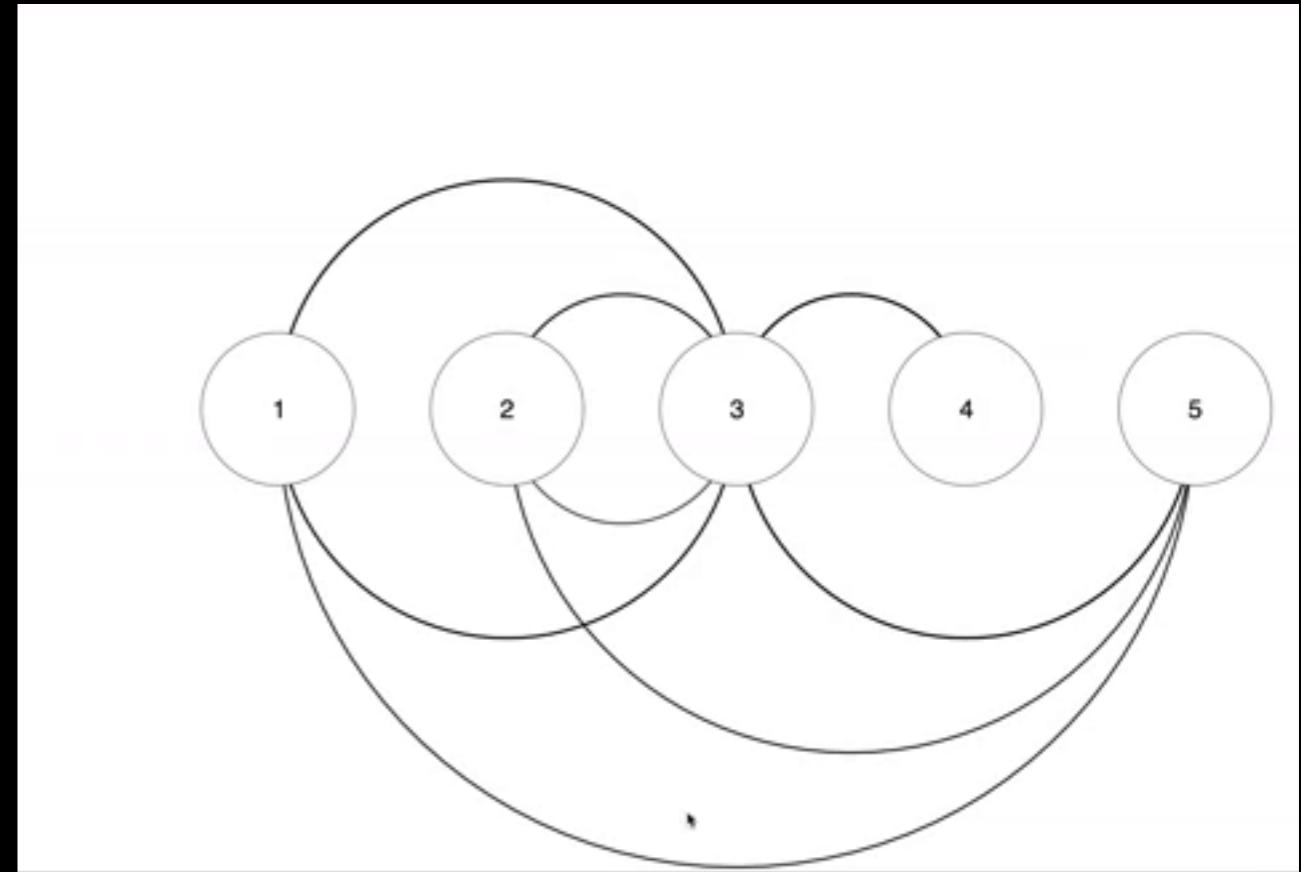
loadTextures()

let animations = SKAction.animate(with: textures,
                                    timePerFrame: 0.05,
                                    resize: false,
                                    restore: false)
loadSprite.run(animations) {
    if let view = self.view as? GameView {
        view.myDelegate?.transitionToView()
    }
}
```

Show cat

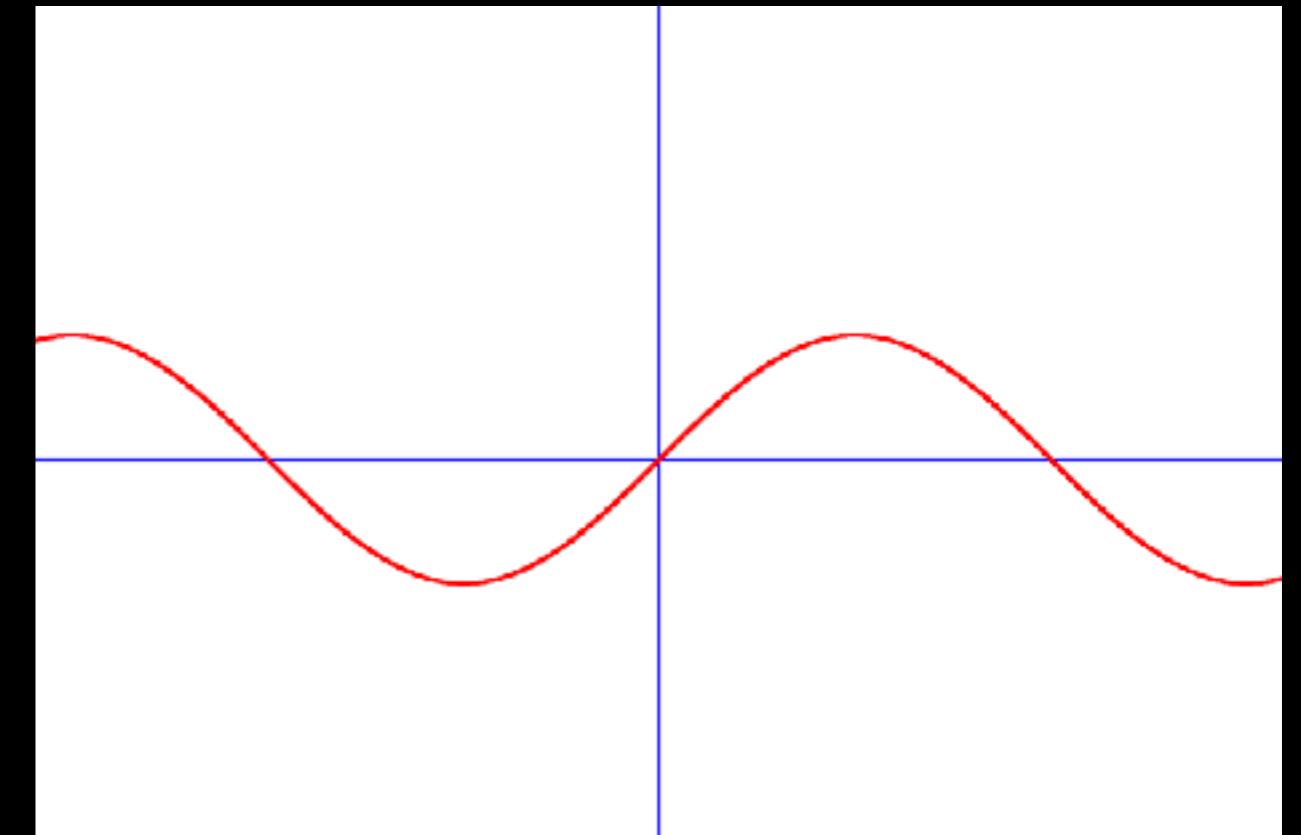
Graphics

Basic Examples



```
let pointSize = CGSize(width: 3, height: 3)
var i: Double = -500
while i < 500 {
    let pointX = SKSpriteNode(color: .blue,
                               size: pointSize)
    pointX.position = CGPoint(x: i, y: 0)
    self.addChild(pointX)
    let pointY = SKSpriteNode(color: .blue,
                               size: pointSize)
    pointY.position = CGPoint(x: 0, y: i)
    self.addChild(pointY)

    let y = 100*sin(i/100)
    let functionPoint = SKSpriteNode(color: .red,
                                      size: pointSize)
    functionPoint.position = CGPoint(x: i, y: y)
    functionPoint.zPosition = 100
    self.addChild(functionPoint)
    i += 0.01
}
```



More?

Literature

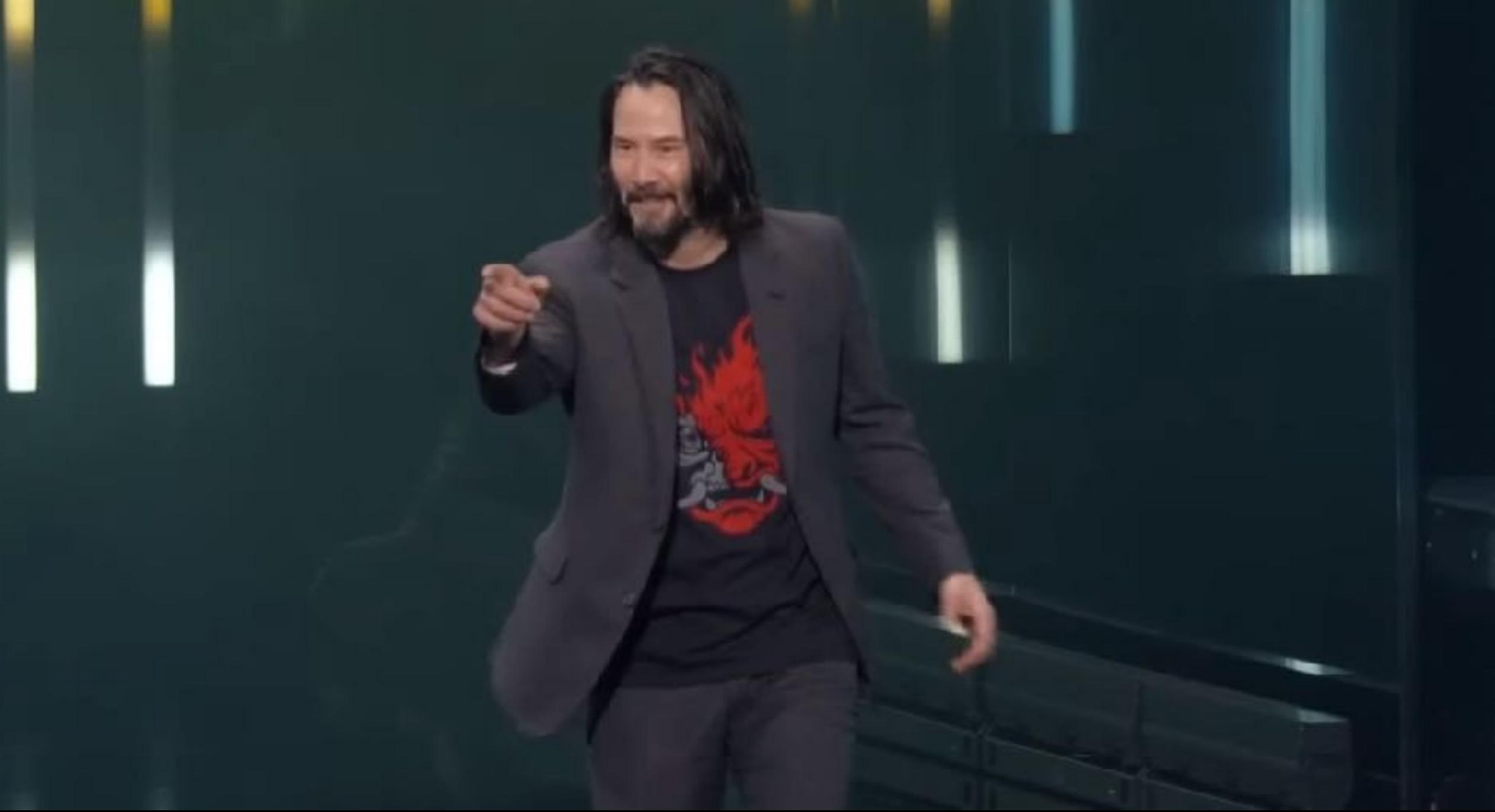
Designing Virtual Worlds – Richard Bartle

<http://mud.co.uk/richard/imucg.htm>

<https://medium.com/cantors-paradise/the-nash-equilibrium-explained-c9ad7e97633a>

<https://dou.ua/lenta/articles/gameplaykit-randomization-state->

https://developer.apple.com/library/archive/documentation/General/Conceptual/GameplayKit_Guide/index.html#/apple_ref/doc/uid/TP40015172



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