
RDC 18
ROBLOX DEVELOPER CONFERENCE

Melee Combat: Design and Tech

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Who I Am

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Industry vs Roblox

Shooters in Industry

- Arcade, Milsim, Arena
- Standards:
  - Favor Shooter
  - Ballistic vs Hitscan
- Multiplayer Tech:
  - One Directional

Shooters in Roblox

- Standards match industry
- Ballistics in some games

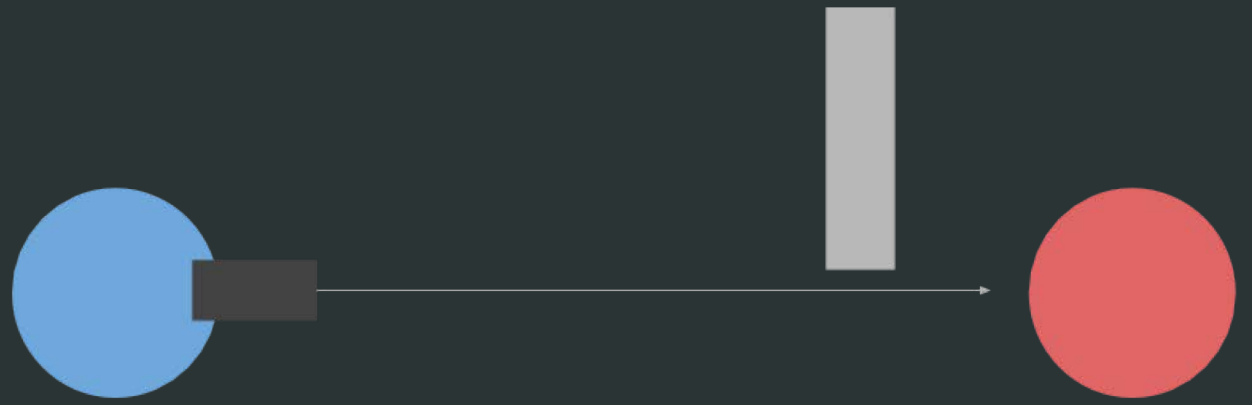
Melee in Industry

- More varied than shooters
- Unique Tech
- Bi-directional interaction

Melee in Roblox

- Most Cases
  - Designed much like shooters
  - No sense of "back and forth“
  - No real **feedback**
- Exception
  - Legendary

Shooter vs Melee Design (Industry)



Making a Good Melee Combat system

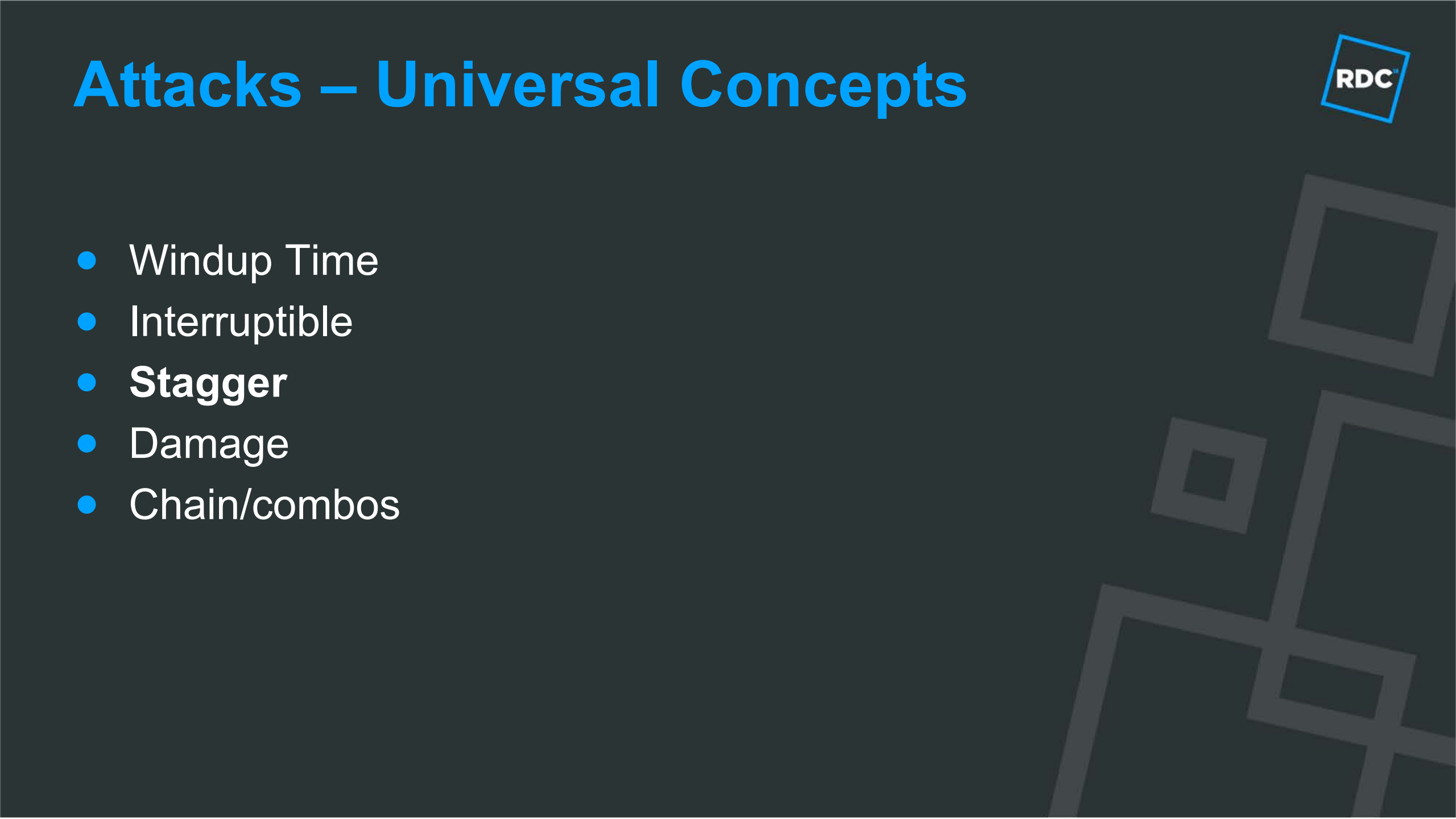
Melee Ideal – The Perfect Duel

- Think samurai movies/anime

(Masaki Kobayashi's **Samurai Rebellion** (1967))

- Defending + Looking for opening to Strike
- Tricking an enemy into creating an opening

Attacks – Universal Concepts

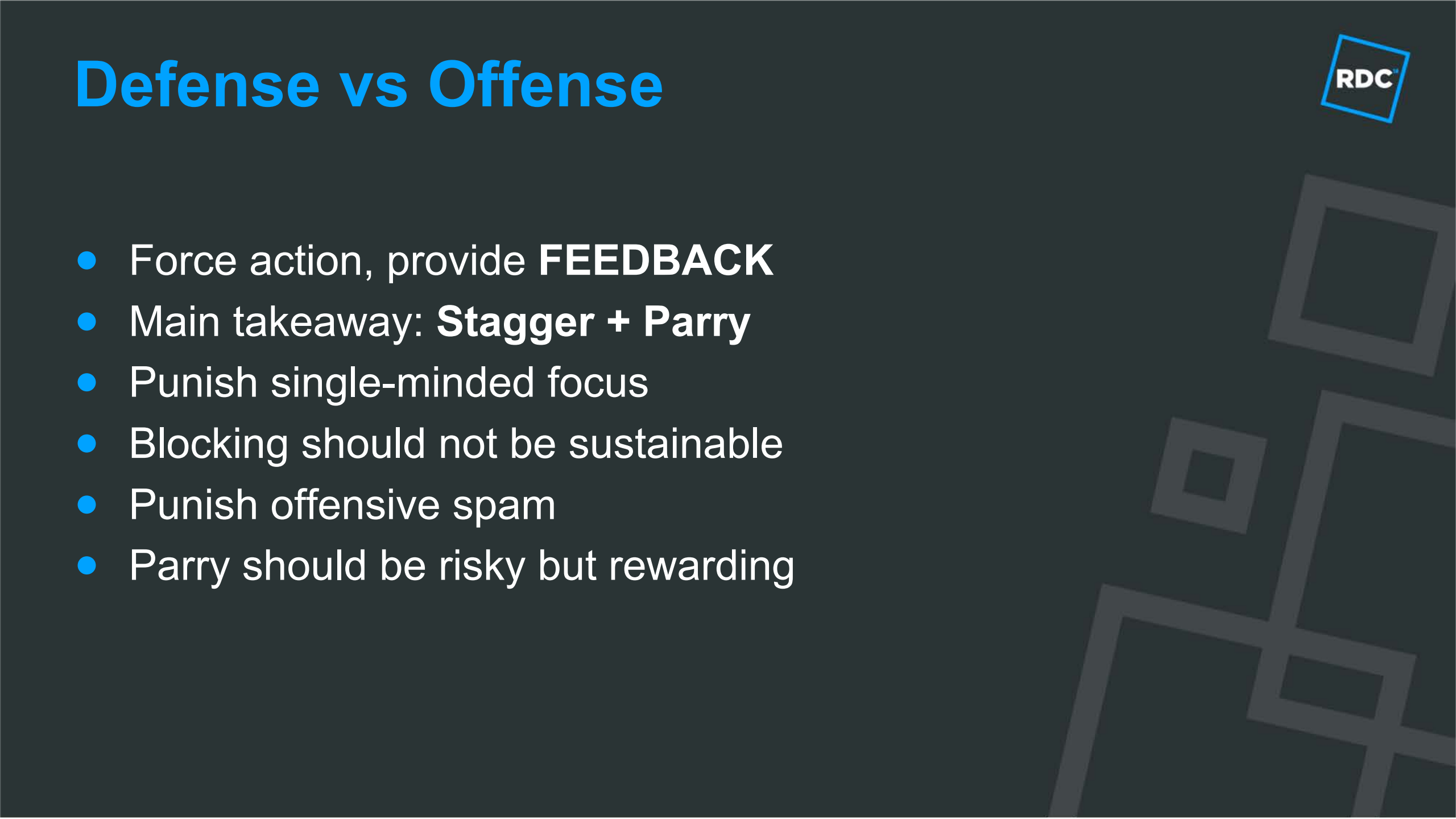


- Windup Time
- Interruptible
- **Stagger**
- Damage
- Chain/combos

Defense – Universal Concepts

- Dodge
  - Positioning Based
- Block
  - *Safe* defense without extra benefit
- **Parry**
  - *Risky* counter that rewards precision

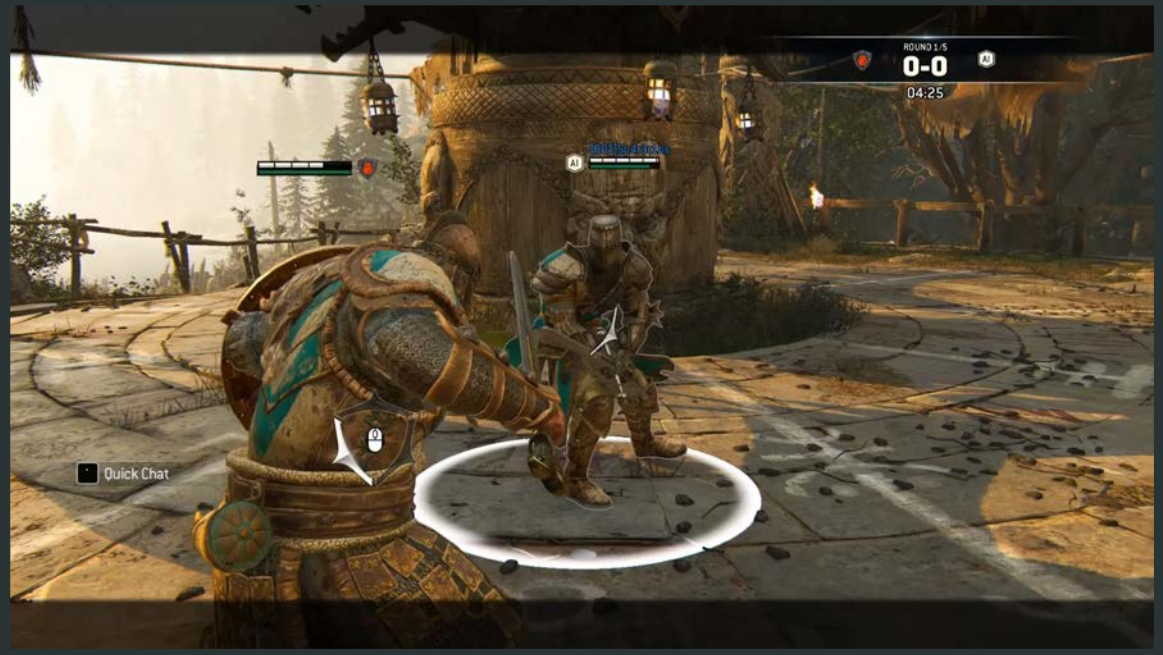
Defense vs Offense



- Force action, provide **FEEDBACK**
- Main takeaway: **Stagger + Parry**
- Punish single-minded focus
- Blocking should not be sustainable
- Punish offensive spam
- Parry should be risky but rewarding

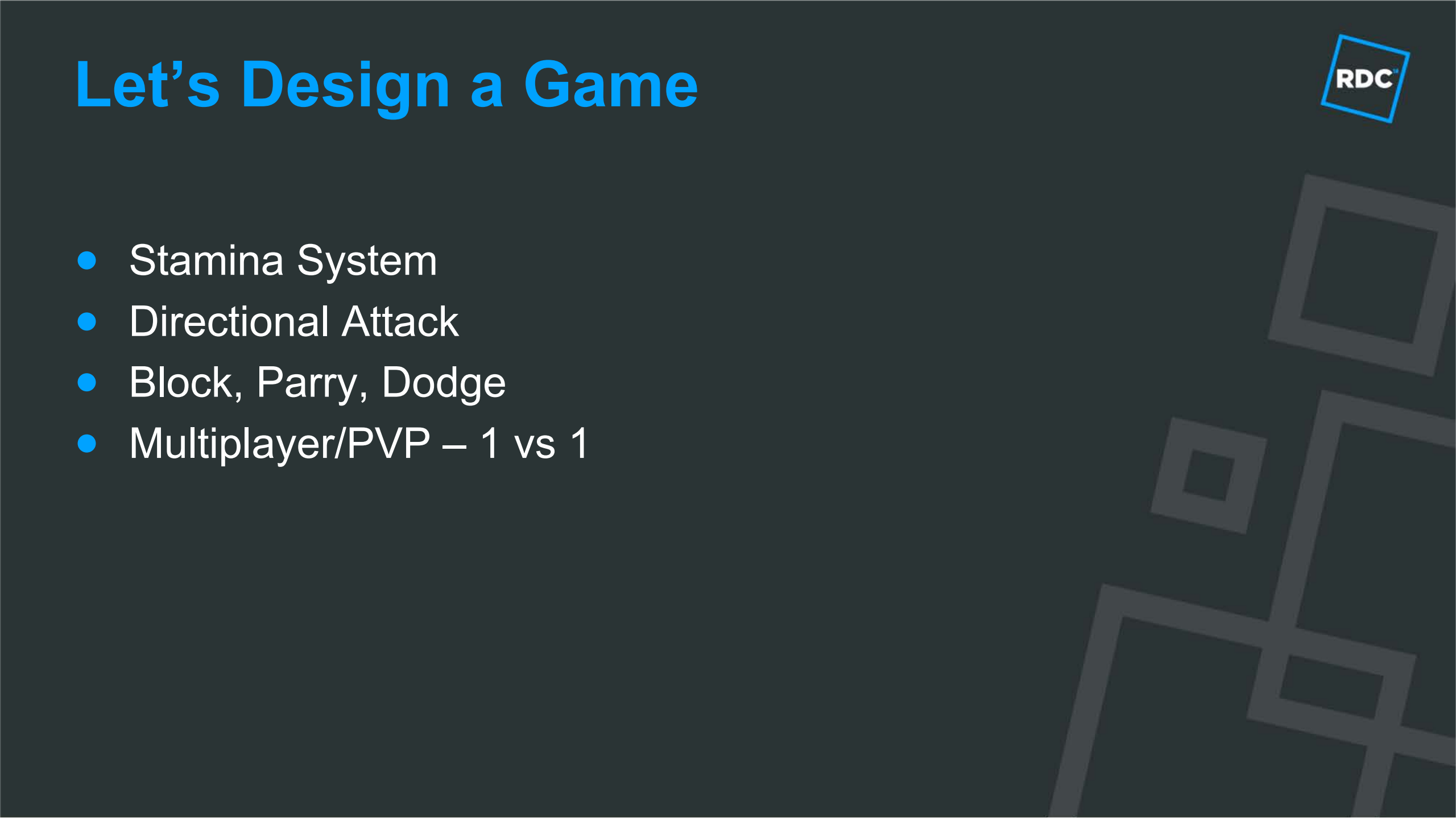
Block + Stagger

Why parries are awesome



Design a Game Example in Roblox

Let’s Design a Game



- Stamina System
- Directional Attack
- Block, Parry, Dodge
- Multiplayer/PVP – 1 vs 1

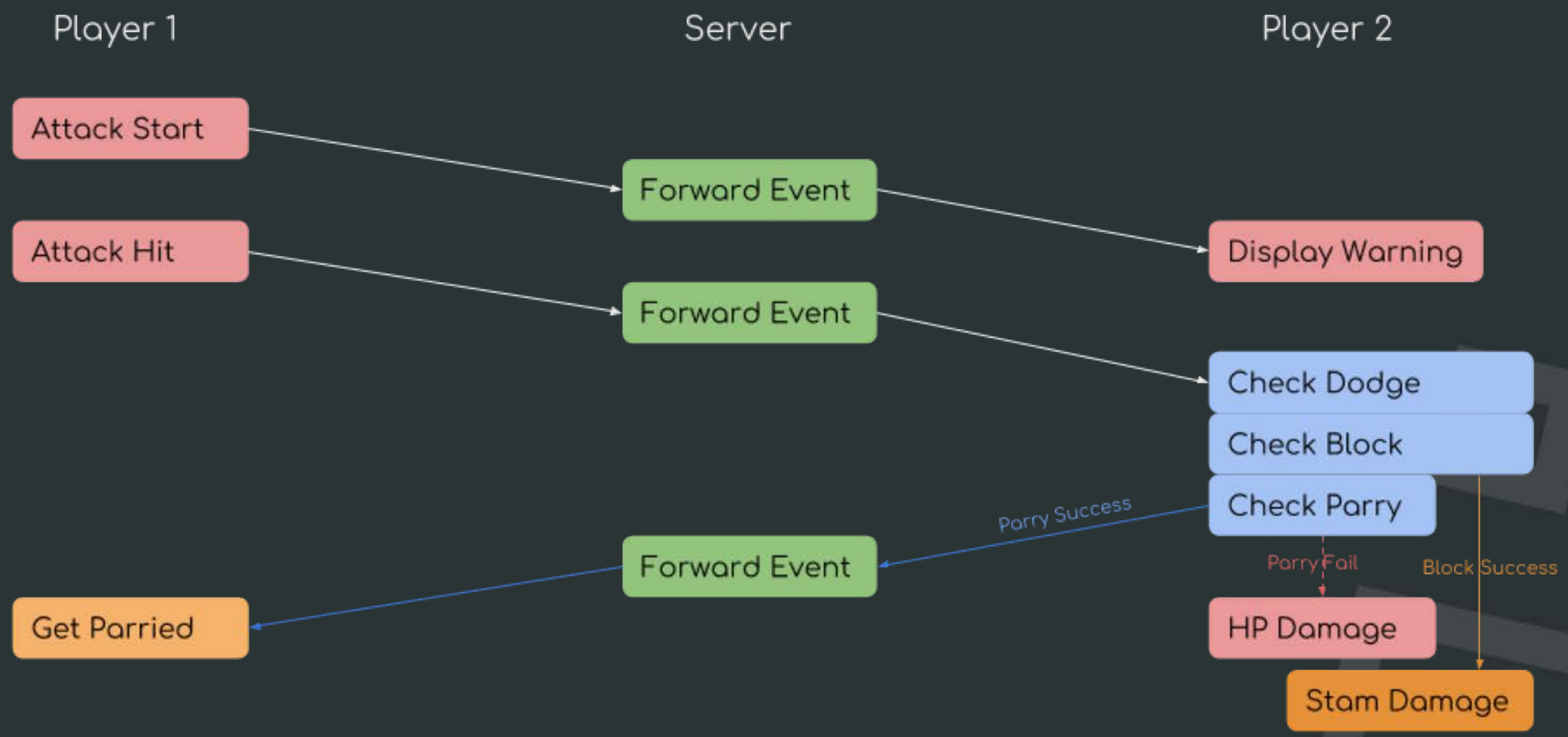
Anatomy of an *Attack*

- Attacker
  - Does Damage
  - Staggers
- Defender
  - Can Block, Parry, Dodge
  - Can take Damage
  - Can also Attack
- Multiplayer:
  - Latency vs Attack Speed

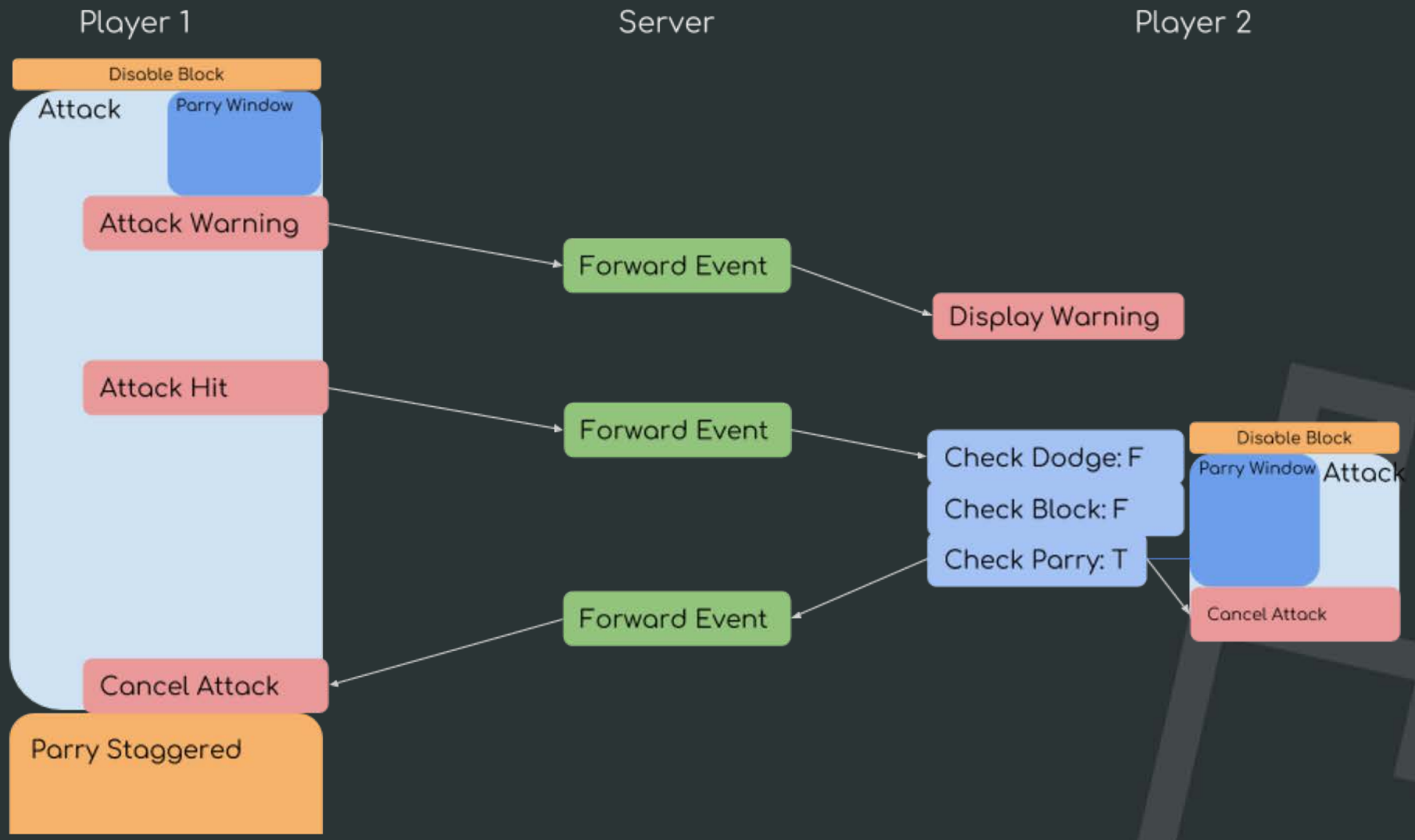
New Attack == Data, not Code

```
37  -- RIGHT ATTACKS --
38  --  EFFECTDATA                      createEffect(   offsetTime, effectDuration, effectType, ...)
39  --  MOVEMENTDATA                    createMovement(offsetTime,  moveDuration, moveDirection,        moveDis
40  --  ACTIONDATA                      createAction(length, priority, animation,              reach,  damage,
41  local rA1Movement =   ActionManager.createMovement( 0.2,        0.4,          Vector3.new(0, 0, 1), 5)
42  local rightAction_1 = ActionManager.createAction(   1.0,        1, Animations.RightSwing1,  4,      20,
43  table.insert(rightActions, rightAction_1)
44
45  local rA2Movement =   ActionManager.createMovement( 0.2,        0.2,          Vector3.new(1, 0, 1), 2)
46  local rightAction_2 = ActionManager.createAction(   1.2,        1, Animations.RightSwing2,  4,      30,
47  table.insert(rightActions, rightAction_2)
48
49  -- LEFT ATTACKS --
50  local lA1Movement =   ActionManager.createMovement( 0.2,        0.4,          Vector3.new(0, 0, 1), 5)
51  local leftAction_1 = ActionManager.createAction(    1.0,        1, Animations.LeftSwing1,   4,      20,
52  table.insert(leftActions, leftAction_1)
53
54  local lA2Movement =   ActionManager.createMovement( 0.2,        0.2,          Vector3.new(-1, 0, 1),    2)
55  local leftAction_2 = ActionManager.createAction(    1.2,        1, Animations.LeftSwing2,   4,      30,
56  table.insert(leftActions, leftAction_2)
```

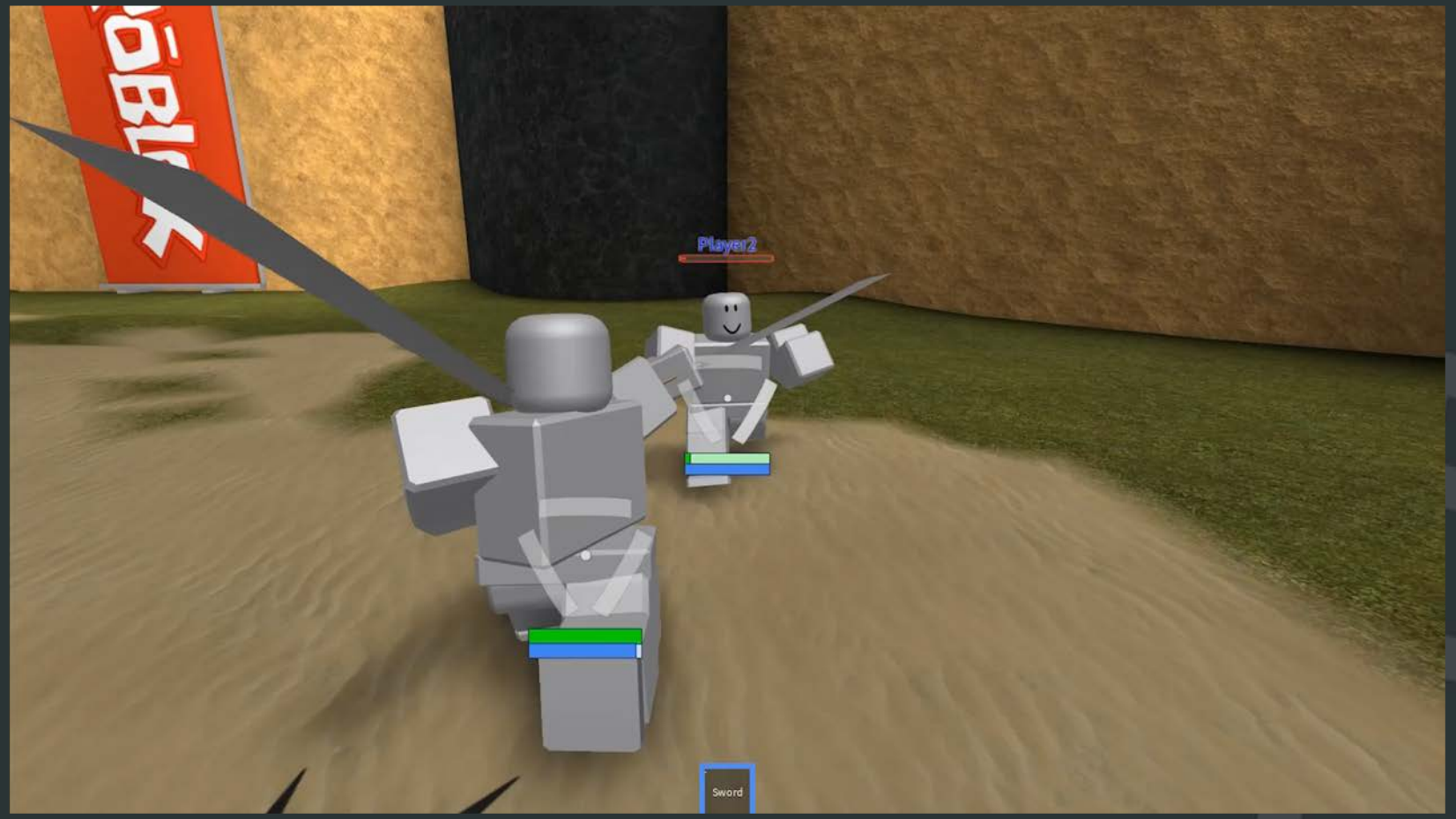
Anatomy of an *Attack*



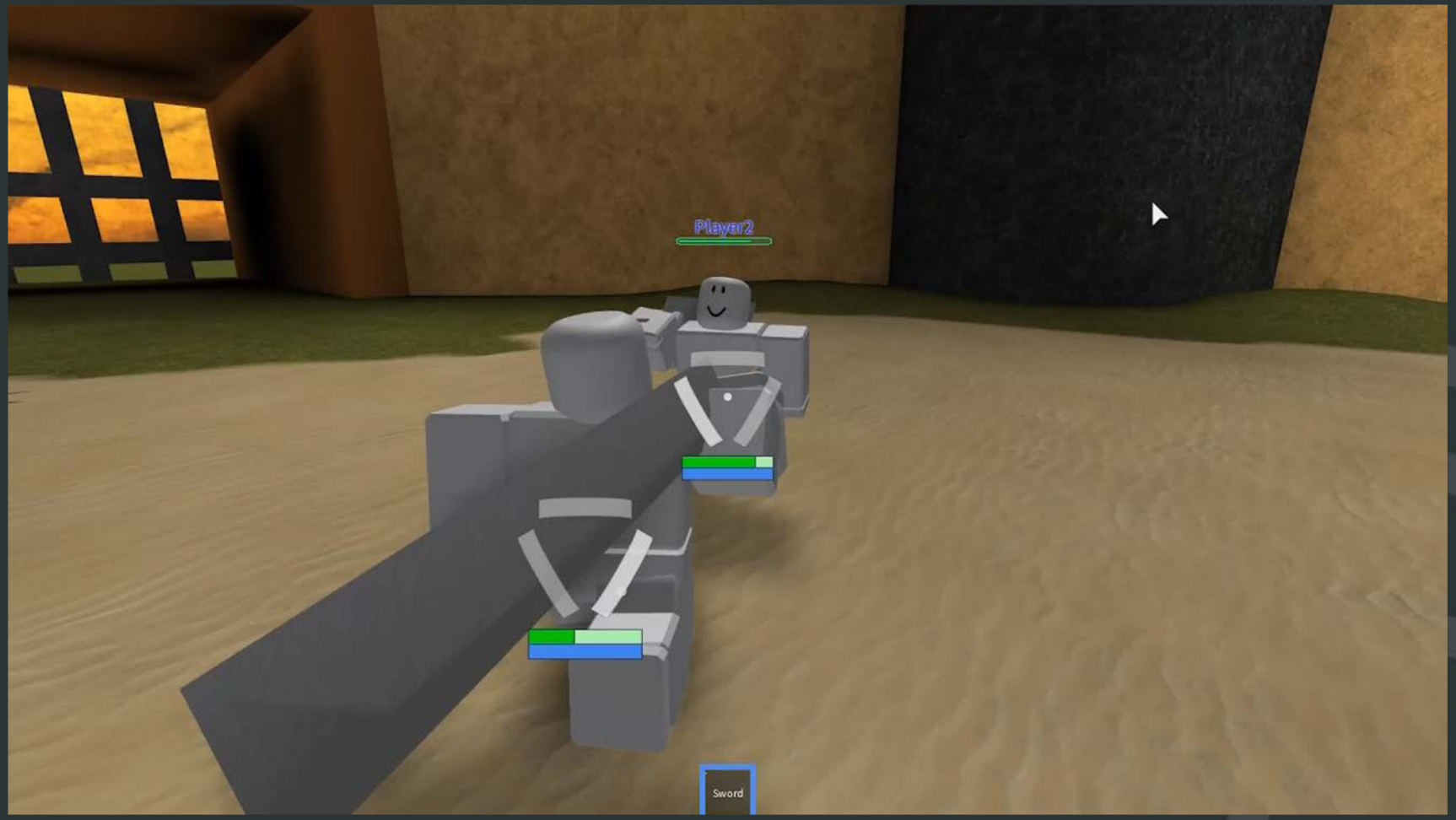
Anatomy of an *Attack* – Parry Timing



Roblox - Stagger



Roblox - Block



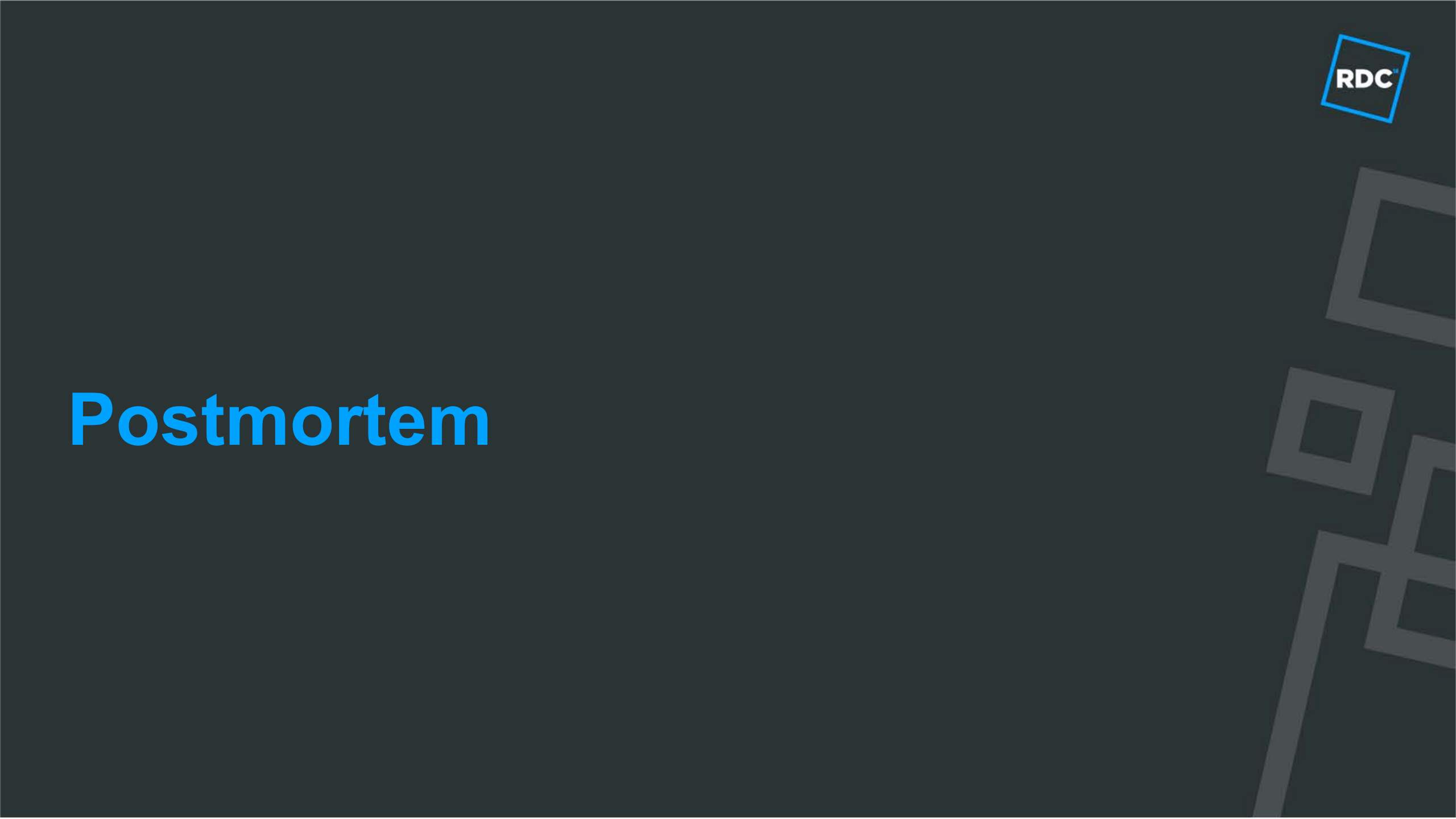
Roblox - Parry

Designing for Multiplayer

- Latency
  - Slower attacks easier to deal with latency
- Hit Detection
  - Mix of Collision (Unlocked) + Guaranteed when locked
- Client - Driven
  - Favors Active (attack or defense)
  - Out of sync

Roblox – Raw Gameplay

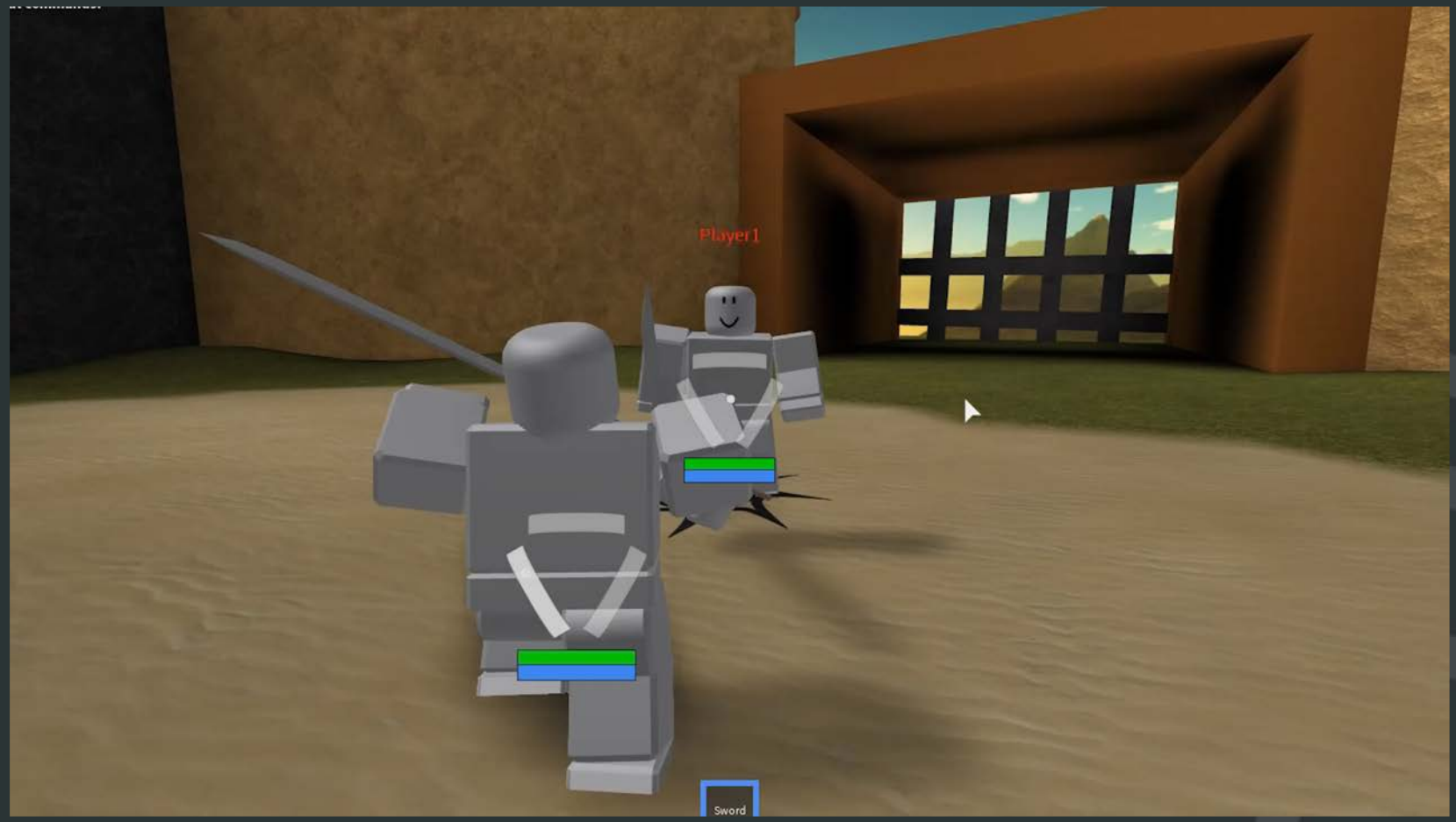
Postmortem



Design Feedback Loop – Tune for Fun

- Important to Tune animations
  - Damage on visual hit
  - When does sword move fastest?
  - Tweak details
- Movement complements animations
  - Attacks should push the enemy back on successful hit

Feedback Follow-up – Attack and Stagger



Alternative Designs

- Server Authoritative System
  - Security vs Responsiveness
  - Predictive logic on Client
- "Paired" animation system
  - More realistic sword deflections
  - Requires even more Engine-level code

Conclusion

- Roblox market niche with room for expansion
- Requires custom "Lua Melee Engine" writing
- Art intensive
- Just like in industry - there are less "rules" to designing Melee Combat Systems vs Shooter Combat Systems
- Good feedback for Roblox Engineers

External Material

- Game Maker's Toolkit - What Makes a Good Combat System
  - https://www.youtube.com/watch?v=8X4fx-YncqA

External Gameplay Sources

- Destiny 2 - Bungie
- Battlefield 4 - DICE
- Player Uknown's Battlegrounds - PUBGCorp
- Dark Souls III - Fromsoftware
- Final Fantasy XV - Square Enix
- For Honor - Ubisoft
- Guild Wars 2 – Arenanet

Roblox Gameplay Sources

- Polyguns – Mailbox Games
- Phantom Forces – StyLiS Studios
- Counter Blox: Roblox Offensive – ROLVe Community
- Beyond – B-b Studio
- Dragon Ball Z Final Stand - SnakeWorl
- Swordburst 2 – Swordburst 2 (team)
- Legendary – pa00

Q & A