

## Lecture 3

# Mobile Gameplay

# Focus of Today's Talk

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Smartphones



Tablets

# Unfortunately, Not This



# Challenge: Input Modality

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- Don't have standard gamepad controls
  - Add-on hardware is unpopular
  - Not standard, few games use
- Loss of a lot of functionality
  - D-Pads, joysticks for avatar control
  - Buttons for performing core actions
- Have to **rethink game input**





# The Cheap Way Out



# The Cheap Way Out



# So What Can We Do?

- (Multi) Touch Controls
  - Pointing, dragging
  - Clicking, selecting
  - More advanced gestures
- Accelerometer Support
  - Tilting
  - Rotating





# So What Can We Do?

- (Multi) Touch Controls

- Pointing, dragging
- Clicking, selecting
- More

AR features (light, camera) are also a possibility.



- Accelerometer Support

- Tilting
- Rotating



# Touch: Basic Approach

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- Can use touch interface like a **mouse**
  - Touch to click on a point,
  - Trace from touch to drag
- Port mouse-heavy PC/Mac games
  - Particularly strategy games/RPGs
- Keyboard exists, but is limited
  - Have to obscure screen to pull up keyboard
  - Use very sparingly (e.g. save file)



# Example: *Plants vs. Zombies*





# 4152 Example: *Gathering Sky*



# Balancing Multitouch

- PC games are “balanced” for a single pointer
  - Multitasking requires a lot of back and forth
  - Challenge is to do actions in an efficient order
- Multitouch eliminates this challenge
  - Fingers everywhere!
  - Movement is fast
  - **Ex:** *Whack-a-Zombie*



# Size Matters

- Small screen makes multitouch *hard*
  - True multitouch only on a tablet
  - Phones are largely limited to gestures
- Fingers are **fatter** than pointers



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# Click versus Pointing

- PCs use **hover** to give information
  - Gives pop-up menus, tool-tips
  - Used in RPGs, strategy games
  - Major UI design technique
- There is no hover on mobile!
  - How to distinguish action from info?
  - **Press-and-hold** is becoming the standard
  - So actions must happen on **release**, not press.





# Example: Assassin's Creed Rebellion

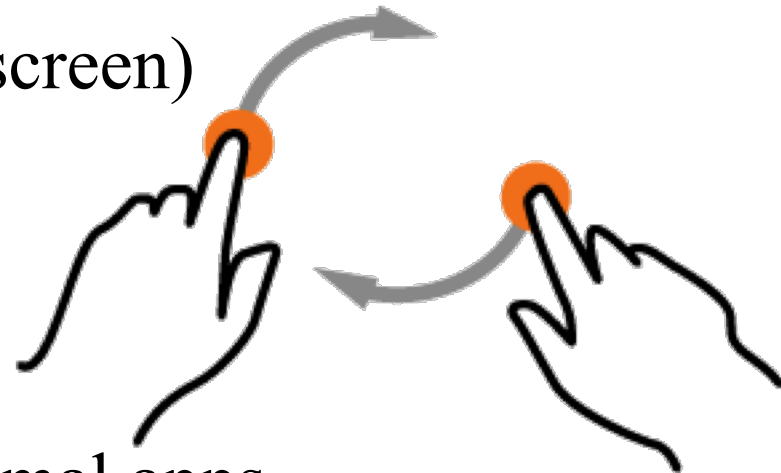




# Touch: Gestures

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- Can also leverage device **gestures**
  - Manipulation strokes common to device
  - **Example:** Pinching for zoom
  - **Example:** Rotating (object, screen)
- Natural for camera control
- **Design Approach:**
  - Think about how used in normal apps
  - How do you leverage this in a game?



# Basic Gestures

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**Tap**



**Double Tap**



**Tap and Hold**



**Flick**



**Pinch**



**Spread**



**Rotate**



**Drag (Scroll)**

# Simple Multitouch Gestures

## Two Fingers



Tap



Tap/Press



Double Tap



Drag

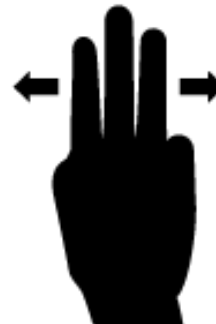
## Three Fingers



Tap



Double Tap



Swipe



Drag

# Simple Multitouch Gestures

## Two Fingers



Tap

Sort of possible to get position



Tap/Press



Double Tap



Drag

## Three Fingers



Tap

Getting position is largely hopeless



Double Tap



Swipe



Drag

# 4152 Example: *Phantom Escape*



# 4152 Example: *G.M.P.*





# Touch: Natural Controls

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- Successful games strive for **natural controls**
  - Verb controlled by a single movement/gesture
  - Gesture has a very natural physical feel to it
  - Maps naturally on to the action in the game
- **Examples**
  - Cutting (Cut the Rope)
  - Tracing (Flight Control)
  - Pulling (Angry Birds)
  - Twisting (Monument Valley)



# Example: *Cut the Rope*



# Example: *Flight Control*



# 4152 Example: *Flick Ship Spaceship*





# Example: *Zen Bound*

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# Example: *The Room*





# Example: *Monument Valley*

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# Specialized Gestures: *Infinity Blade*

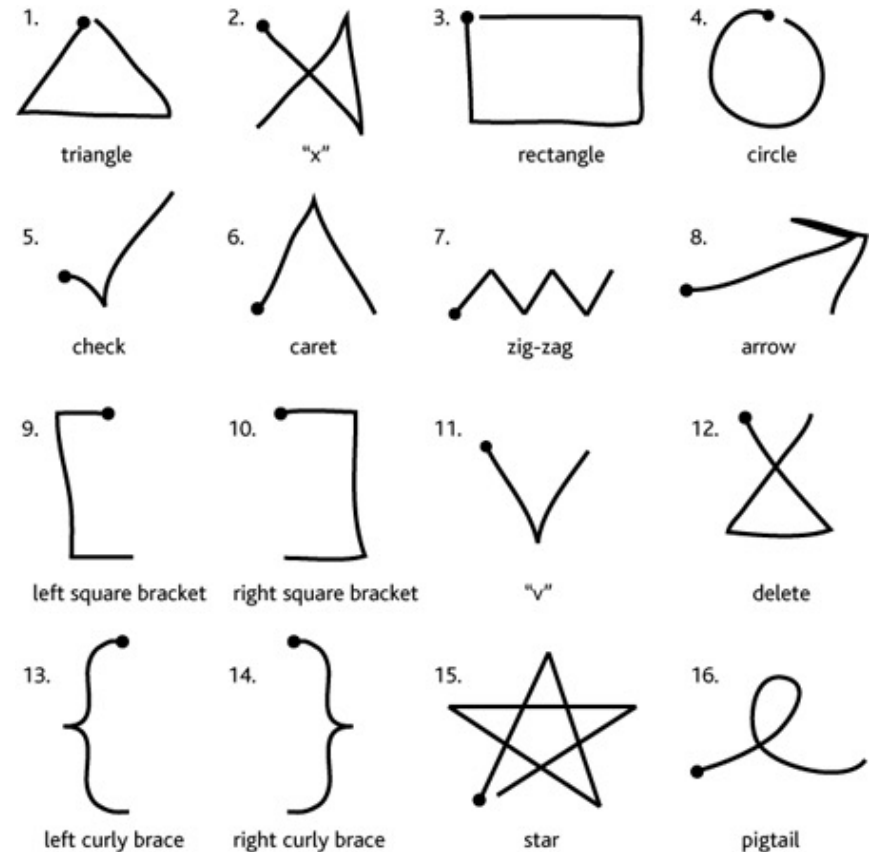


Draw  
symbol on  
screen

Spell is  
cast when  
done

# Dollar Gestures

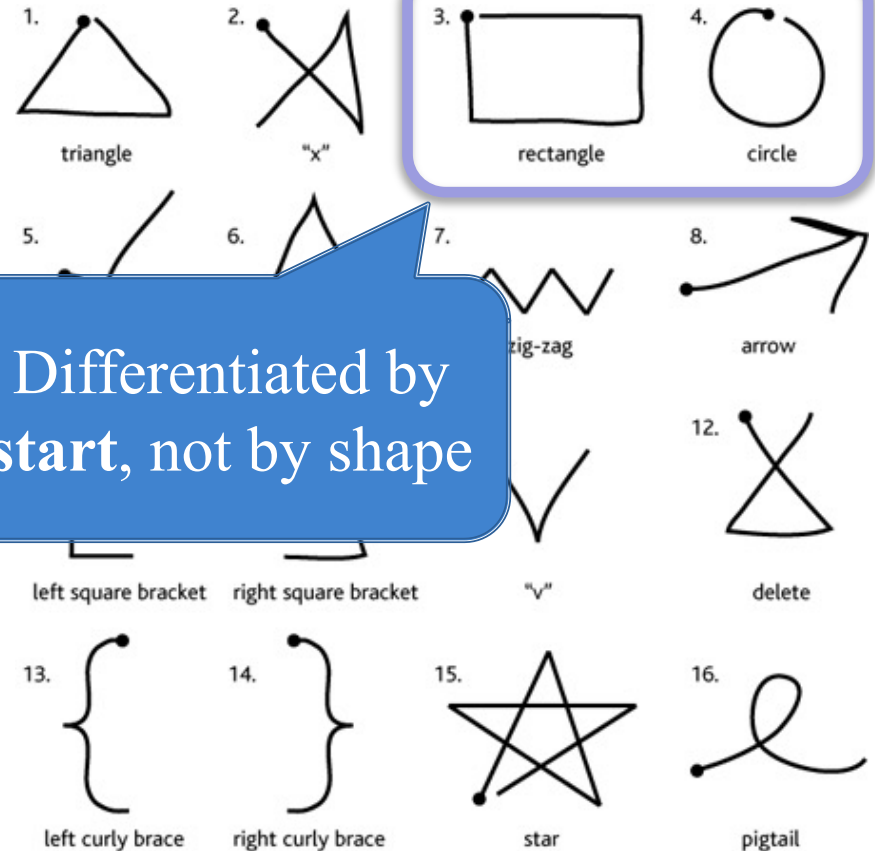
- Recordable gesture API
  - Created a U. Washington
  - Code freely distributed
- Very limited resolution
  - Scales gesture to pixel grid
  - Grid uniquely identifies
  - Shape AND start matter
- **MEng project from 2020**
  - **Planned integration soon**



<http://depts.washington.edu/madlab/proj/dollar>

# Dollar Gestures

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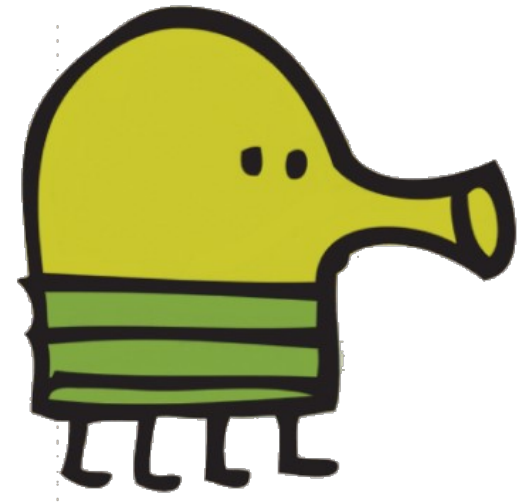
<http://depts.washington.edu/madlab/proj/dollar>



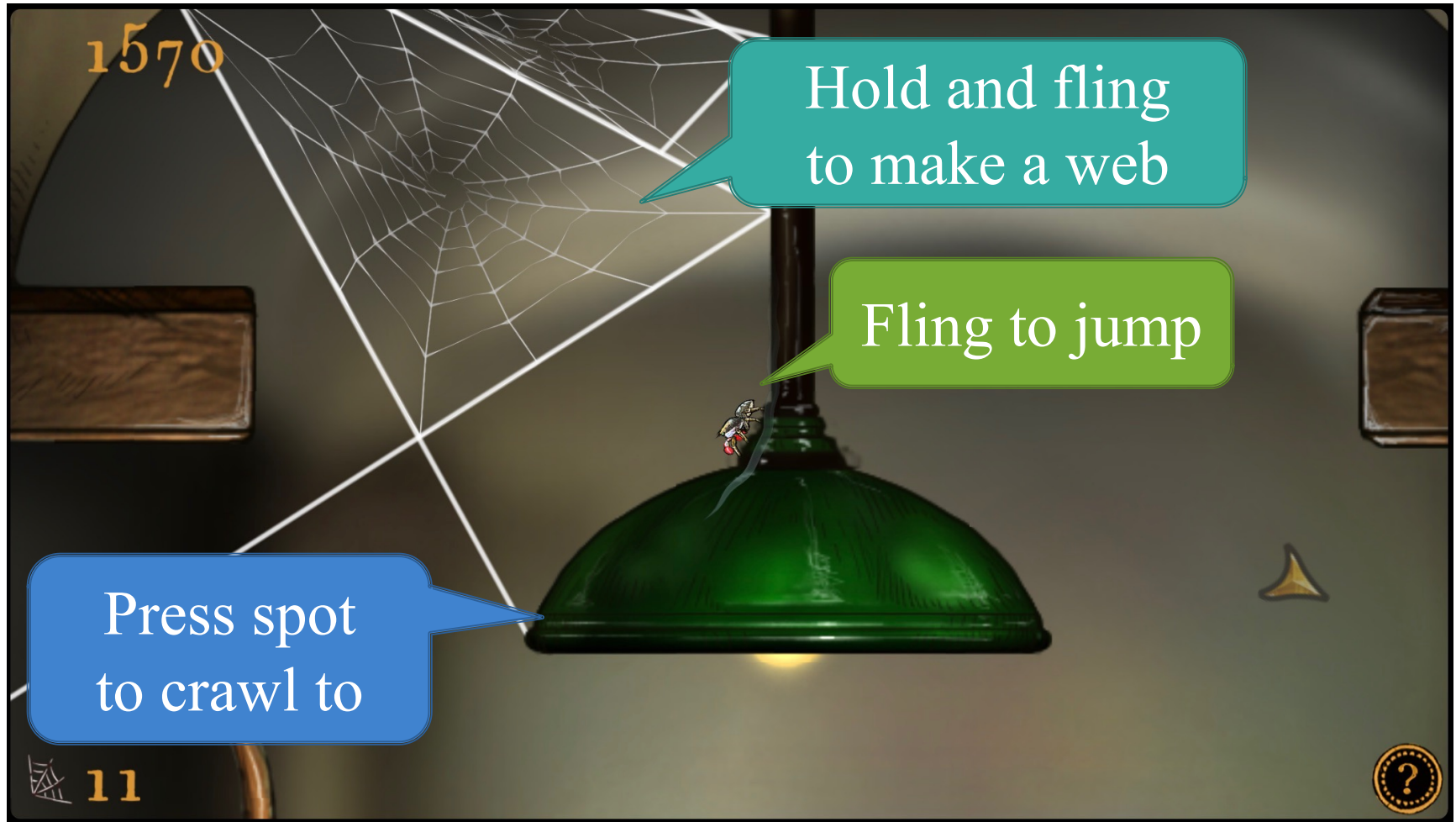
# Touch: Avatar Controls

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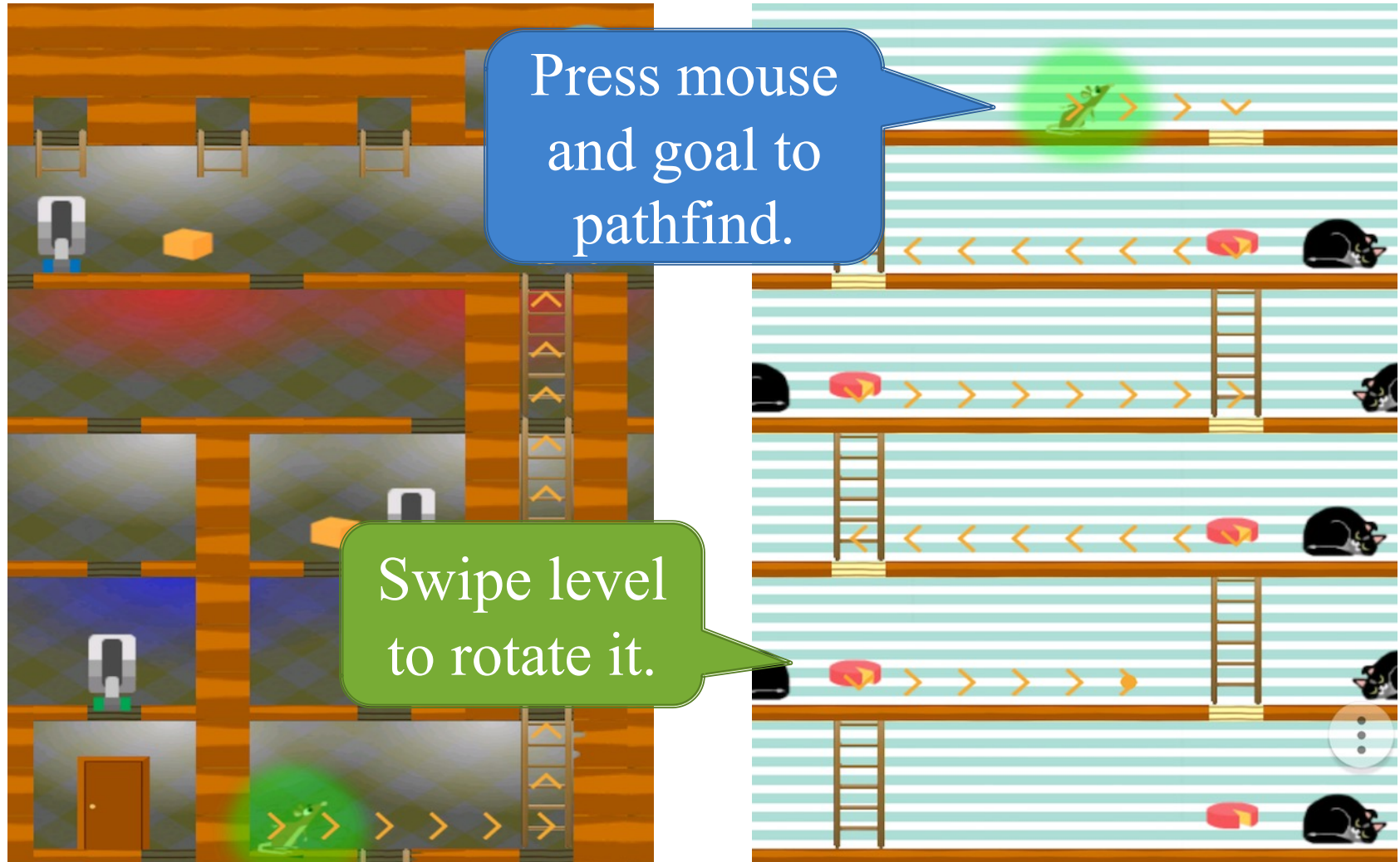
- Several (non-joystick) options for movement
  - Drag the character
  - Point to a waypoint
  - Point to direction
- But how to indicate avatar actions?
  - Want to move and act at same time
- **One Solution:** put actions into movement modes
  - Drag versus waypoint
  - Press+hold drag versus drag



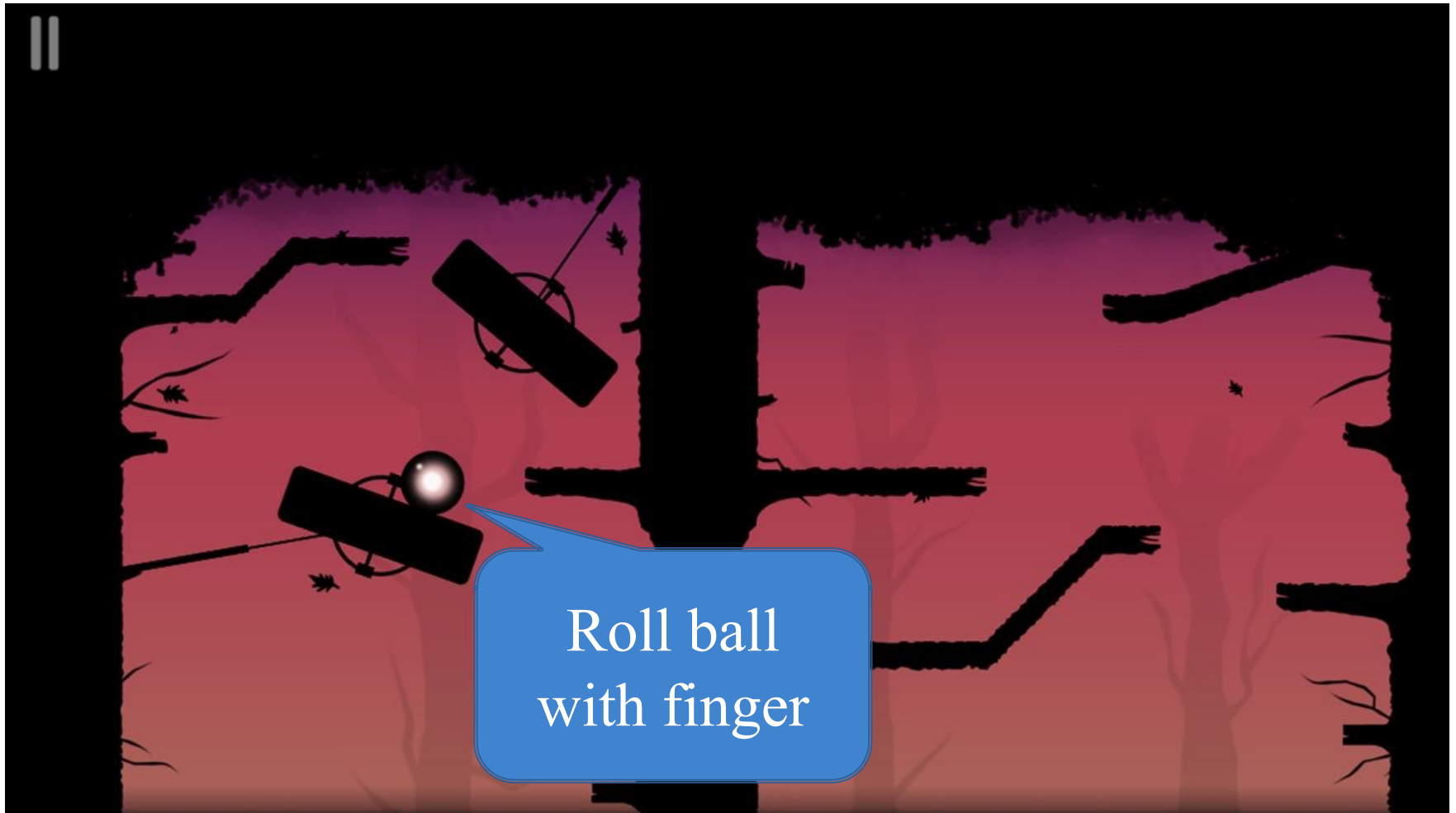
# Example: *Spider*



# 4152 Example: *Squeak & Swipe*



# Early Platformer: *Night Sky*

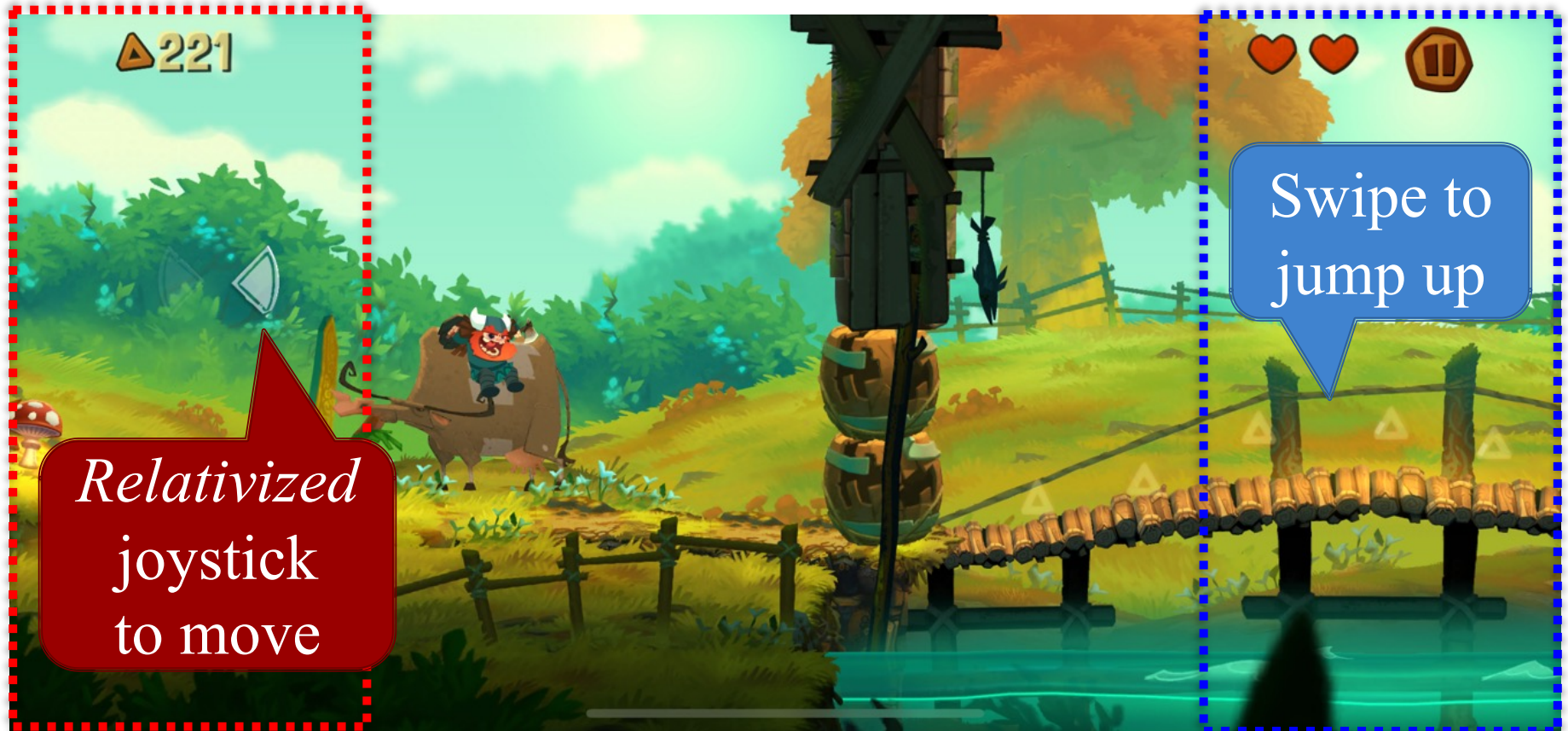




# Early Platformer: *Type:Rider*



# Modern Platformer: *Oddmar*



# Accelerometer: Basics

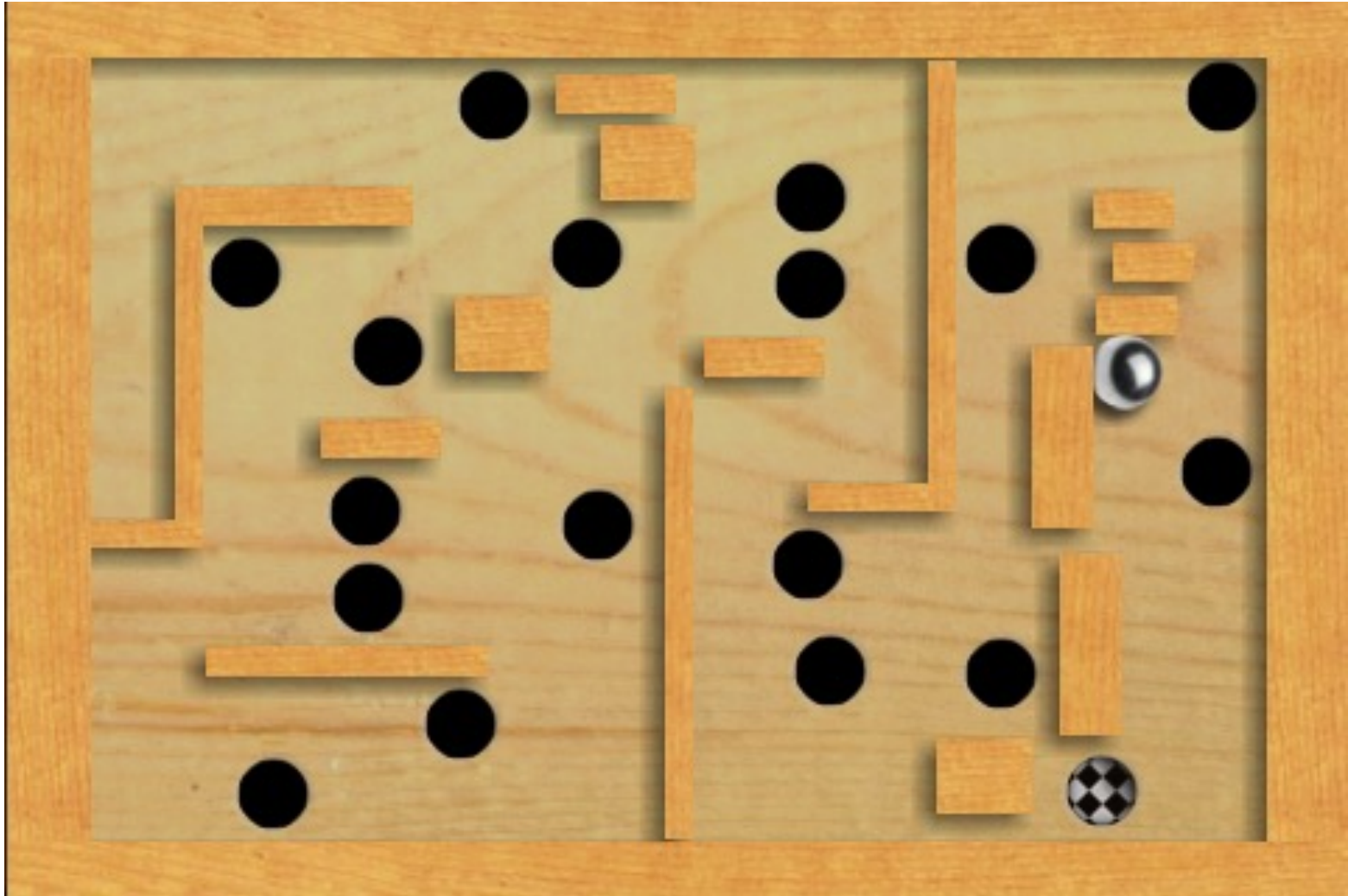
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- **Can** detect rotational movement
  - Rotate from flat plane
  - Rotate around edge
- **Cannot** detect other movement
  - Lateral movement of device
  - Absolute position of device
- Ideal mechanic for
  - Marble-style games
  - Steering/On-rails games





# Example: *Labyrinth 2*





# Accelerometer + Touch

- Solves the problem of actions
  - Use accelerometer for movement
  - Use touch for other actions
- But have to hold the device
  - Hard to gesture as well
- **Idea:** Keep actions unobtrusive
  - Avoid "button mashing" mechanics
  - Allow touch to use thumbs as much as possible



# Example: *Nightmare Tower*



# Accelerometer: Challenges

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- The control device is the **display**
  - Extreme controls make game hard to see
  - Even worse when combine with touch
- Even basic movement is a **challenge**
  - Hard to quickly change directions
  - Prone to overcorrection
  - **Example:** *Labyrinth*



# Accelerometer: Orientation

- Can detect device orientation
  - Either portrait or landscape
  - Use for different game modes
- *Sword & Sworcery EP*
  - Landscape for exploration
  - Portrait for combat
- Supported in SDL/CUGL
  - 2<sup>nd</sup> year in CUGL
  - Add listener to **Display**





# Example: *Flipped Out!*



# Final Word: Know Your Audience

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- **Phone games** are meant for "quick play"
  - Must be able to start, play, and save in 2 minutes
  - Should be able to pick up where left off quickly
  - Controls should be (relatively) simple
- **Tablet games** can be more complex
  - Supports longer play units (why?)
  - Larger screen permits more complex controls
  - Games are closer to PC indie games
  - And can also cost more!