Game Control

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Game Control System (1/2)

- **Game control** is the interface between the game and the user.
- **Game control** is not only input device control but also the camera control.
- **Input device control**
  - **On PC**
    - Mouse
    - Keyboard
    - Gamepad
  - **On game console**
    - Gamepad buttons
      - 0 or 255
    - Joystick
      - 0 - 255
Game Control System (2/2)

- Camera control
  - First-personal view
  - Third-personal view
  - God view
  - Pre-set camera view
  - Etc
Mouse Control (1/3)

- **Mouse is a 2D device.**
  - 2-axis moving
  - Related movement
  - 2 or 3 buttons

- **Mouse can:**
  - Move
  - Drag
  - Double-click

- **Behaviors**
  - Hit test
  - Selection
  - Pilot
    - Position & orientation
Mouse Control (2/3)

- **Typical game types using mouse control**
  - Real-time strategy games
  - Role Playing Game

- **Typical game play examples:**
  - Path finding for playable character
  - Hitting the enemy
  - Selecting a group of units
  - Orientating the camera in FPS games
  - Menu selection
  - ...

- **Features**
  - Always coupling with god-view camera control
    - Viewing from the top of game world
Mouse Control (3/3)

- Easy to hand on
  - 一鼠到底
- Slow action
  - Compared with joystick
  - Value range from -32727 ~ 32727
Keyboard Control (1/3)

- Standard PC input device
- Simulating the gamepads
  - Not every PC game player having gamepad
  - Using keyboard as the alternative device
- Hotkey system
  - Each key has two states.
    - Pressed
    - Released
  - 256 keys
- Behaviors
  - Key presses/released
  - ASCII code
- One hotkey can represent a set of commands
  - Very fast input device
Keyboard Control (2/3)

- **Communication tool**
  - Typing messages

- **Typical game types using keyboard**
  - MMORPG
    - Needs chatting with friends
  - Real-time strategy games
    - Hotkey system
  - First-person shooting games
  - Fighting games

- **Typical game play examples:**
  - Chatting
  - Character controls
    - Move forward
    - Turning
Keyboard Control (3/3)

- **Features**
  - Shortcut for a sequence of actions
    - Commands
    - Menu selection
  - But a little bit complicated for players
    - 256 keys
Gamepad Control (1/3)

- A small “keyboard” designed for game playing
  - Gamepad can map to the hotkey system
  - Same behaviors
  - Less than 20 keys
- Majors keys:
Recent gamepad capable of two extra digital joysticks
- For buttons
  - Value range: 0 or 255
- For joystick
  - Value range: 0 to 255

Typical game types using gamepad
- Almost all types of games except
  - Need typing
  - Need large-range selection for game units

Typical game play examples:
- Character controls
  - Move forward
  - Turn
Gamepad Control (3/3)

- Combat system in a fighting game
  - Move forward
  - Turn
  - ...

- Features
  - Designed for game playing
    - Look and feel
  - Easy to hand-on
    - If you not to challenge the players’ usual practice
Camera Control

- **Types**
  - First-personal view
  - Third-personal view but following the playable character
  - God view
    - Fixed
    - Following the playable character
  - Fixed view
    - Pre-rendered background
  - Pre-set view
  - ...

- Very sensitive to game play design & game control
- Camera control is not an independent system
God-view Camera Example
Use arrow keys on keyboard or gamepad

Basic key assignments:
- Up key to move the playable character forward
- Down key to turn character facing to the camera and move forward
- Left & right keys to turn the character to left or right
- The camera following the character to move
- And keeping a range of distance, a reasonable height and look-down angle with the character.
Detailed key assignments:

- **Up key**
  - Turn the character facing back to the camera
  - Move the character forward
  - If the distance between the character and the camera is larger than a pre-set range, move the camera forward to keep the distance.
  - At the same time, the height to the ground will be changed to synchronize with the character.

- **Down key**
  - Turn the character facing to the camera
  - Move the character forward
  - The camera will move backward to keep a distance with the character.
  - The height to the ground will be changed to synchronize with the character.
If the camera is blocked by obstacle to move backward, raise the height of the camera but keep the eyes on the character.
Right key

- Turn the character facing to the right of the camera.
- Take the camera’s position as a circle center and the distance between the camera and the character as the radius.
- Set the circle as the movement orbit.
- Let the character move on the orbit.
- When the character moving, turn the camera to right to keep eyes on the character.
When the character hitting the obstacle, let the character keep on turning and moving, use the same approach in “Down key” step to raise the camera.

- Left key
  - As same as “Right key” step except the left direction.

Reference game examples:
- Sprinter cell 3
- PSO
- Prince of Persia (波斯王子)
- The Legend of Zelda (薩爾達傳說)
- ...

Demo: 1st DCI students’ work: iRobot