Analog Control For Martial Arts Video Games

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ABSTRACT
Current martial arts video games require players to learn complex combinations of joystick motions and button presses in order to execute a large but fixed set of moves. My interface uses an analog joystick to provide a more natural interface that allows the user to perform many variations on a smaller set of moves.

Keywords
Joystick, Video games

INTRODUCTION
Martial arts video games such as Tekken 4 [2] provide the player with an eight-direction joystick or thumb pad and 3 to 6 buttons. The characters have dozens of offensive and defensive moves, and most of the moves require the user to execute a combination of joystick motions and button presses. This interface style creates two problems. First, the player must spend a long time learning all the combinations of controller movements. Second, the player can only perform specific moves that have been programmed into the game in advance.

My interface uses an analog joystick with five buttons, similar to the interfaces described by Laszlo et al. [1]. Each move utilizes a natural mapping from the joystick to the character's motion, and the player can vary the character's movements by moving the stick differently.

INTERFACE DESCRIPTION
If the player is not pressing a button, the character is in a neutral stance and the player can move the joystick to stand, crouch, and lean forward and backward. The player uses four buttons to specify an arm or leg that he wants to move. To execute a high right leg kick, the player presses and holds the right leg button and moves the joystick up and to the left to draw back the character's leg, as shown in figure 1. The player then sweeps the stick to the right, keeping it at the top of its range. The player could execute a lower kick by keeping the joystick lower. With different joystick motions, the player can also delay his kick, fake a high kick and then kick low, etc.

The player can kick with the left leg and punch with either arm in a similar fashion. The player can also hold down the defense button and an arm or leg button in order to block with that arm or leg. All punches, kicks and blocks are controlled with the analog joystick.

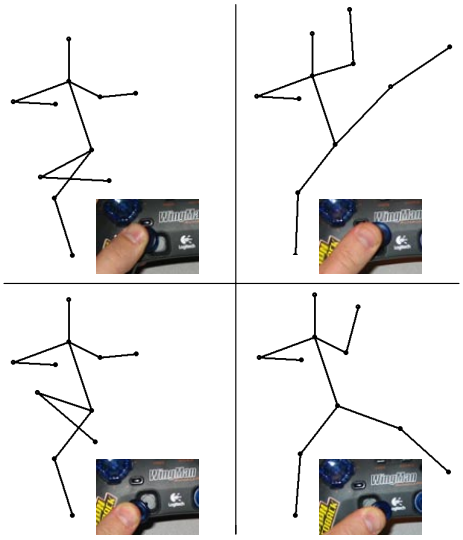

Figure 1: An analog joystick provides a natural mapping and allows variation

IMPLEMENTATION
My demonstration program computes the character's position by interpolating between pre-programmed poses and using a simple physics simulation to move the character from the current pose toward the desired pose.

Each punch, kick, and block corresponds to a set of four pre-programmed 2D character poses, and each of the four poses corresponds to one of the four corners of the joystick's range of motion. The program computes a weighted average position for each joint in each of the four poses using the x and y positions of the joystick as the weights. The resulting pose is the "target pose". A simple physics simulation applies a force to each of the character's joints to push it toward its target position. [3]

REFERENCES
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