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Surfing on a Sine Wave

Abstract:

'Surfing on a Sine Wave' is a game that will involve MIDI keyboard input, VGA output to a monitor, waveform and physics calculation engines, and game state machines and logic. The game itself is a sidescroller, with the scenery moving left at a constant rate. The character will have a fixed horizontal position on the screen, and will vertically oscillate at a frequency controlled by the MIDI input. The display will contain the character, collectable items such as coins and potentially powerups, hazards such as spikes, and the projected path that the player character will follow. As the frequency is changed, the player will transfer to the new path according to second-order physics. Additional features that will be added given time include music output in the key of the current frequency (a state machine for chord progression), complex oscillations for the player (powerups and/or levels apply a transfer function), and control of the amplitude of the oscillation (based on MIDI amplitude.)