Dynamic Feedback for Execution Errors of Fighting Game Motion Inputs

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Abstract

In competitive fighting games, mastery of your character's special moves is imperative to playing well. Very few fighting games, if any, will actually give the player feedback during the learning process, beyond telling the player when they are doing something right or wrong. I intend to create a tool that will provide the user with dynamic feedback on their mistakes with motion inputs in order to better communicate how they can rectify these mistakes.

Background Information

Fighting games are a (usually) 2D genre of video games where the goal is to defeat your opponent, another player, with various attacks. On most controllers, you have several attack buttons and a joystick for movement. Moving this stick in a direction results in a directional input. A motion input is a combination of several directional inputs, followed by one or more button presses. The result of most motion inputs are "special moves", which are much more powerful than normal moves, and are a requirement for serious play. The special move will only activate if the stick movements are close enough to the expected standard for a given special move. Some motion inputs are more difficult than others.

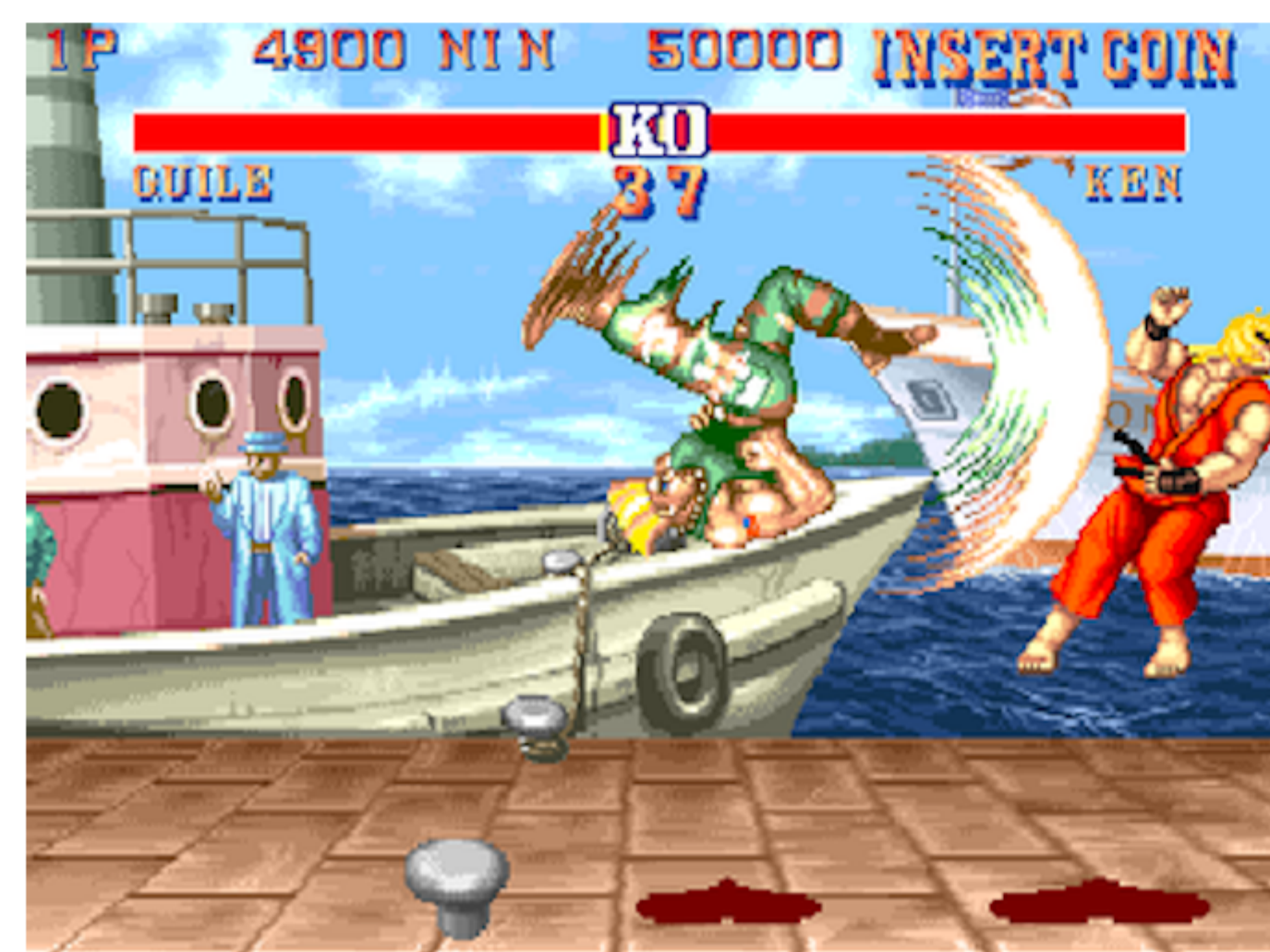Figure 1: A fightstick, a type of controller commonly used to play fighting games.

Figure 2: A screenshot from a match of the arcade version of *Street Fighter II*, a 1991 fighting game from the Street Fighter series.

Methodology

The Numeric Annotation System is a system that numbers the 9 positions a joystick can be placed into, 1-9, as seen in Figure 3. This system allows motion inputs to be designated by a series of numbers and a letter. The letter typically signifies an attack, ending the input. We can parse player inputs for their individual pieces, and compare them to the ideal steps that make the input up. Certain common patterns found within the inputs (see Figure 4), made up of these pieces are common in inputs, and make for good benchmarks when comparing one input to another. By comparing the player's input to the ideal, we could provide dynamic feedback to them.

Research Question

Could a tool that compared player motion inputs in fighting games to their ideal execution give helpful feedback on potential mistakes?
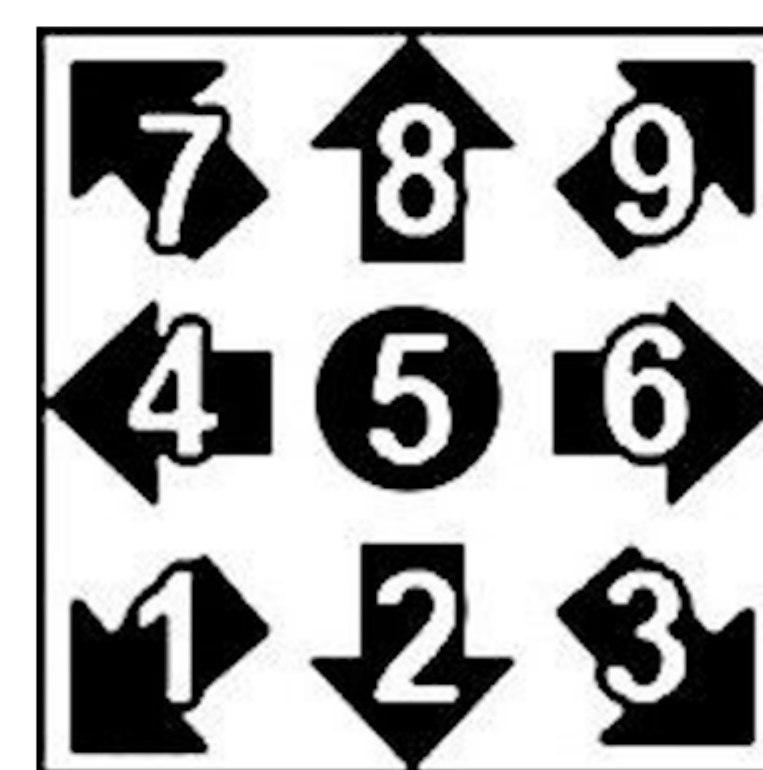

Figure 3: A visualization of the positions that make up Numeric Annotation. Note the resemblance to the keypad of a keyboard.
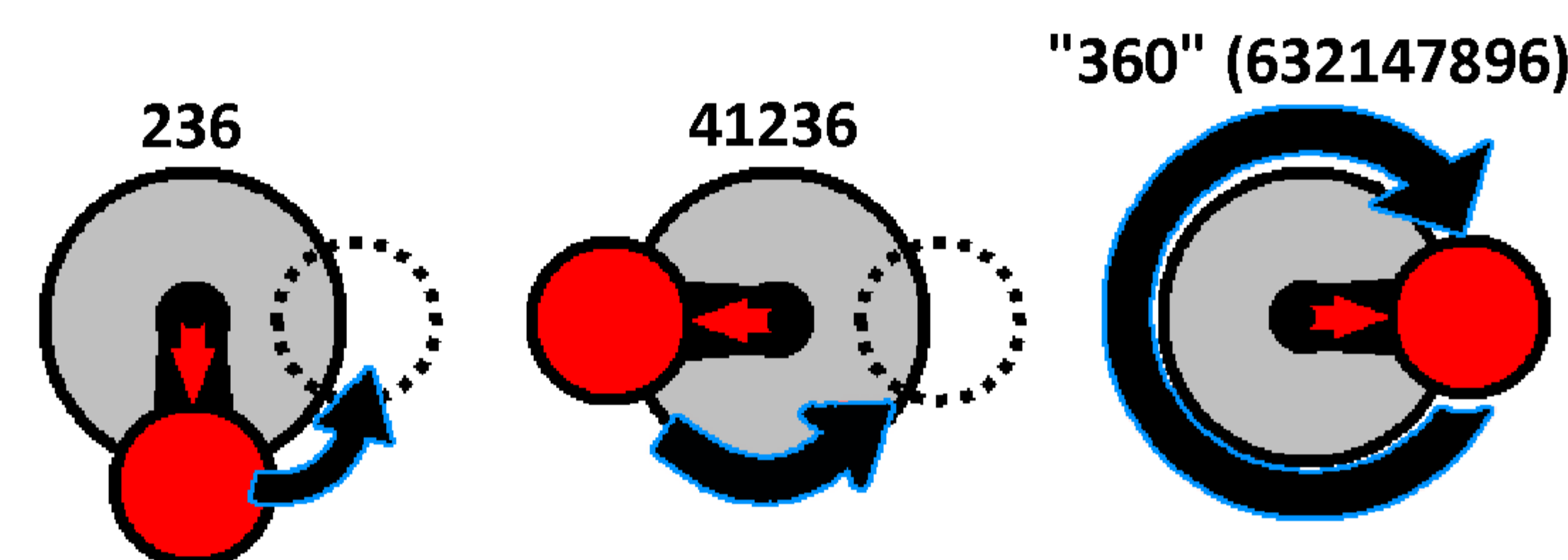

Figure 4: Some different archetypes found within motion inputs, as they appear in my experiment.
From left to right: Quartercircle-forward, halfcircle-forward, 360.

Experimental Process

There are two different groups: an experimental group and a control group. Both groups were instructed to perform a series of different motion inputs. The experimental group had access to the Dynamic Feedback Tool, while the control group did not. Before each new input, every participant was given as many tries to practice the input as they wanted. Then, they were given 5 attempts at the input for real, before the next input was started.

Results of Experiment

The results of the experiment showed that receiving feedback (91.7% total success rate) made little difference compared to receiving no feedback at all. (90.3% total success rate) Infinite practice attempts allowed participants to get good at the inputs before they were scored, and the feedback being too wordy meant participants were disincentivized to read it. More often than not, participants were able to intuit their mistakes and fix them on their own, regardless of if they received feedback or not.
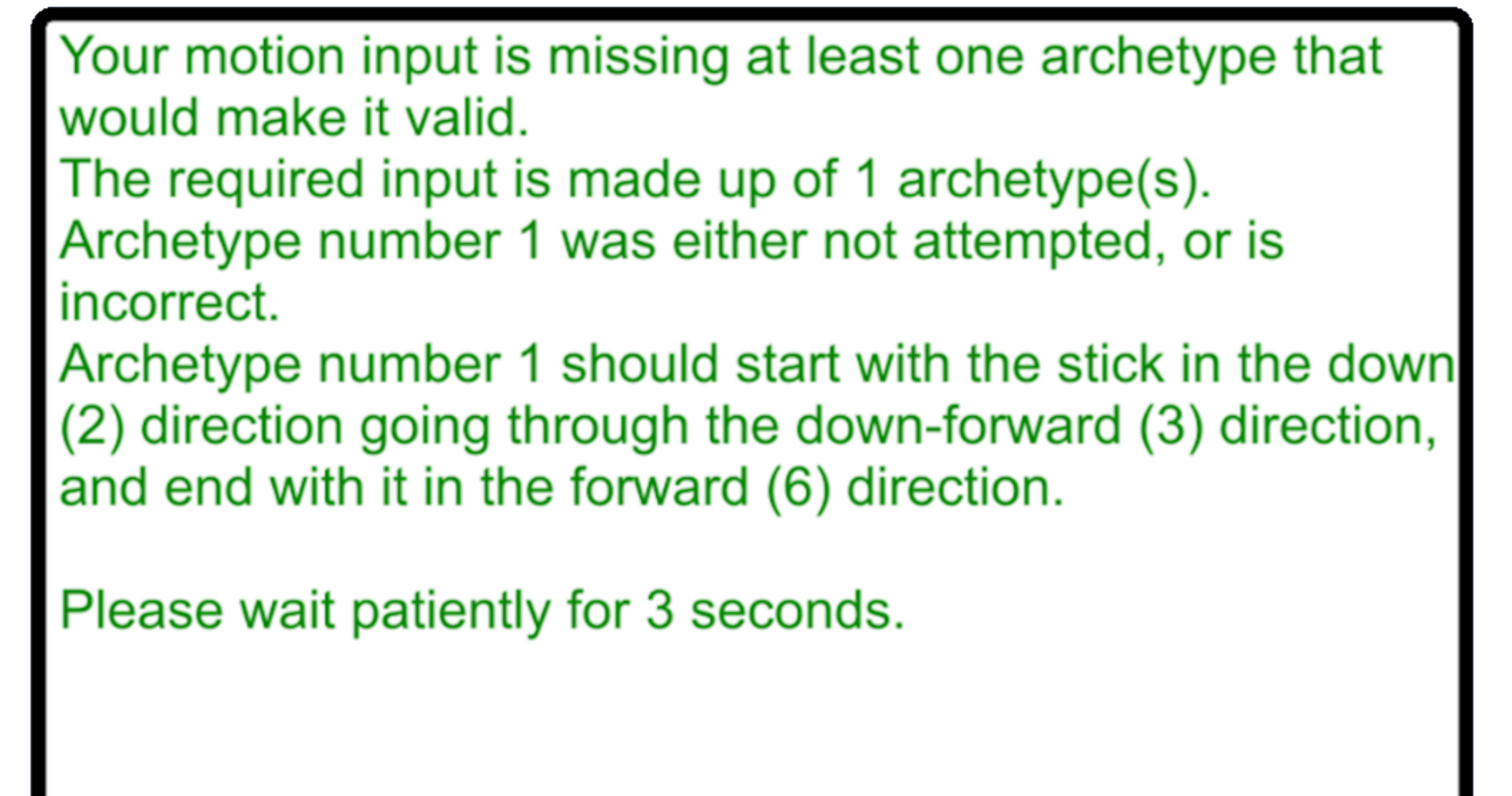

Your motion input is missing at least one archetype that would make it valid.
The required input is made up of 1 archetype(s).
Archetype number 1 was either not attempted, or is incorrect.
Archetype number 1 should start with the stick in the down (2) direction going through the down-forward (3) direction, and end with it in the forward (6) direction.

Please wait patiently for 3 seconds.

Figure 5: The feedback a player would recieve if they inputted "23P" instead of "236P". Very wordy, for just a small mistake.

References & Acknowledgements

- Project made using Unity Game Engine
- Figure 1 specifically shows a Mayflash Arcade Fightstick F300