

Milestone 4 Report: Latency Mitigation

Client Prediction:

The client will take player's input and render the input simultaneously. Then the input will be added into a buffer with a sequence number for future confirmation. The input will also be sent to the server with the same sequence number. After server updated the game state and responded clients, the client will compare server's game state and stored client game state based on the same sequence number. Whenever two game states are not equal, the client will render server's game state immediately.

We choose client prediction to solve the responsiveness problem. With high latency, the client needs to wait server's response to render the game, so players will need to wait a while to see the paddle's movement. By implementing Client Prediction, players can receive feedback from the screen right away.

Interpolation

The client will begin to render the game only after receiving more than 2 game states from the server. The client will also interpolate and render the ball and the other 3 paddle's position based on 2 consecutive game states. In such a way, the ball and the other 3 paddle's movement will look relatively smooth.

Due to the latency, time gaps exist between received game states. The game screen will become choppy due to the lack of game states for rendering. Therefore, we choose interpolation to guess what happened between two known game states. In such a way, the paddle and ball will have a better movement.