# Chess Eraser

1. Overview

Platform：PC

Control：mouse

Genre：Puzzle, strategy

Camera：Top down

2. Rule

* The board has 6 tracks : 3 rings with different size and 3 axis with 60 degrees each other. A chess can only move along a track.
* A chess’s move path is blocked if another chess is in the way.
* Two adjacent chess with same type can be erased from the board.

2. Play Mode

a. Infinite mode

**Goal：Erase more chess for higher score**

* A new chess will spawn in random empty slot, after each move

b. Puzzle mode

**Goal：Erase all chess from the board**

* After each move, at least 1 chess just moved must be erased, otherwise the move is invalid and must be reverted

3. Game Flow

a. Infinite mode

* A fixed number of randomly positioned chess are spawned on the board
* Click to select a chess to move
* Click to select chess to erase
* Each elimination will give you score
* A new chess will spawn in random empty slot, after each move
* The game ends when the board is full

b. Level mode

* A fixed number of well positioned chess are spawned on the board. The chess type and position are well designed and the board can be fulfilled.
* Click to select a chess to move
* Click to select chess to erase
* If these is no chess on the board, you win.
* The types of chess will increase as you progress to higher levels. The more chess types, the more difficult the game.

4. Core concept

The core concept of the game is "Erasing" and "Self-locking".

a. Erasing

* By erasing chess and creating removable space on the board, the more mobile the game is, the larger the movable space, the more test the player's spatial imagination and logical prejudgment ability requires.
* Rules that must be erase after movement limit the player's freedom of retry, so that every step must be well prepared, and there can be no invalid movement steps.

b. self-locking

* Block and co-movement in the rules of the game constrain the scale of movement, only linked chess can move together. On the contrary, if there is a separate chess, only this chess step by step can be eliminated, otherwise it will become an obstacle on the moving path.
* After each move, it is necessary to erase a moved chess, so that the game does have a dead end, such as ABAB type, Players are prone to loose before they can be untangled by one-step movement and no longer notice this.

5. Game Levels

* The overall difficulty of the level is determined by the number of board rings, the larger the number of rings, the more chess, the greater the overall difficulty.
* The difficulty of the game in the same level is not static. The initial erasing will be relatively simple, with the number of pieces erased, due to the self-locking situation, the difficulty of erasing will gradually increase. In the same game with the reduction of chess number, the difficulty of the game will rise.

6. Technical difficulties

* Six-track movement, some are directional axis, some are rings.
* Calculating a chess that can be moved together in all directions. Like in the ringed track, there shall be clockwise and anti-clockwise both OK, but only the short path is chosen.
* After each move, the chess need to be automatically reset to the point in place.
* The mouse controls with 3D objects using ray cast, but should not be interrupted by the UI system.
* The smoothing movement of the pieces
* The turn based but multi-state state machine
* Calculating all chess state to apply different visual feedback