

Exploring Recursive Puzzles in Games

Thinking about Puzzles in
Abstract Strategy Games and
Action Puzzle Games

Martin Grider, 2026



These have always been my two
favorite kinds of games

Abstract Strategy Games and
Action **Puzzle** Games

But... what is an Abstract Strategy game?

Abstract Strategy & Action Puzzle



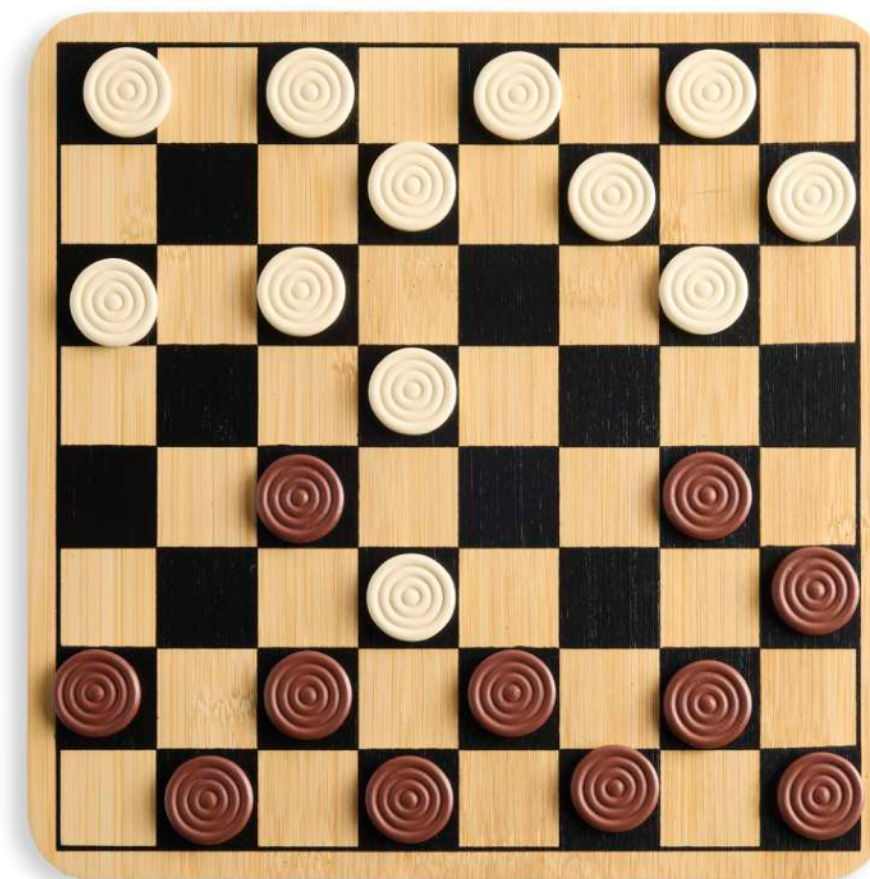
Deep games, "Like Chess or Go"

But... what is an Abstract Strategy game?

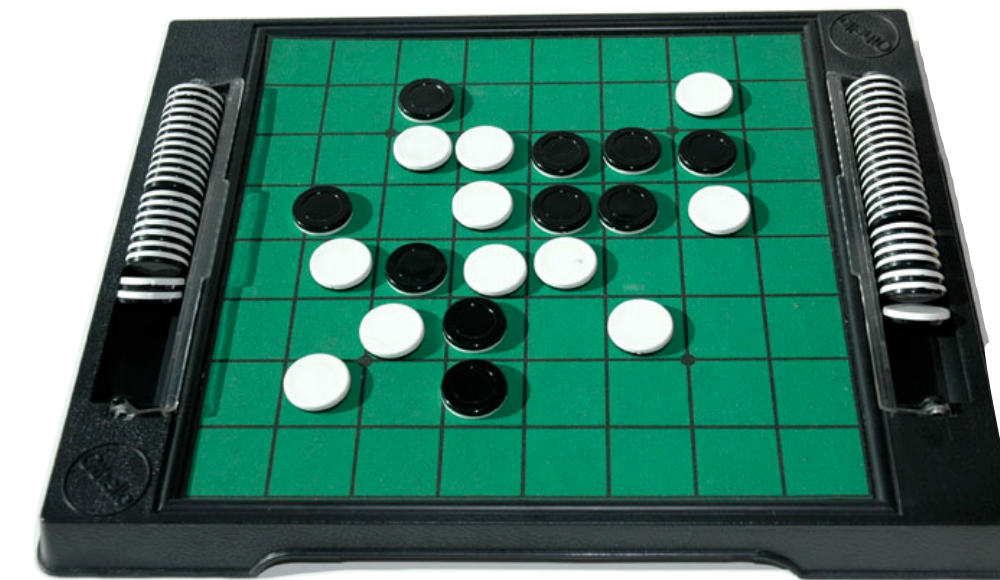
Abstract Strategy & Action Puzzle



Tak



Checkers / Draughts



Othello



Santorini



Hive



Mancala

Other Abstract Strategy game examples

But... what is an Abstract Strategy game?

Abstract Strategy & Action Puzzle

“... an abstract strategy game is an exercise in logical thought. There is an intimate relationship between such games and puzzles: every board position presents the player with the puzzle, *What is the best move?*, which in theory could be solved by logic alone. A good abstract game can therefore be thought of as a "family" of potentially interesting logic puzzles, and the play consists of each player posing such a puzzle to the other. Good players are the ones who find the most difficult puzzles to present to their opponents.

J. Mark Thompson, *Defining the Abstract* (2000)

<https://web.archive.org/web/20001018073731/http://www.thegamesjournal.com/articles/DefiningtheAbstract.shtml>

Puzzles in Abstract Strategy game

Abstract Strategy & Action Puzzle

- The kinds of puzzles Thompson describes are *ambiguous*.
- There is no “one solution”.
- You don’t get feedback on your solution until the game is over.

Puzzles in Abstract Strategy game

Abstract Strategy & Action Puzzle

- In Chess, (perhaps the most written about game of all time?*), people study these puzzles (moves and board positions), and write books about how often they lead to victory.
- A sequence of moves that is well studied is referred to as: “on book”.

* It's unknown how many books on Chess have been written, but it seems likely the number is well over 30,000. (The size of the Royal Dutch Library in The Hague's Chess and Droughts collection.)

Not-ambiguous Abstract Strategy puzzles

Abstract Strategy & Action Puzzle



Mate In One Move Puzzles



1. Black to play



2. Black to play



3. Black to play



4. Black to play



5. White to play



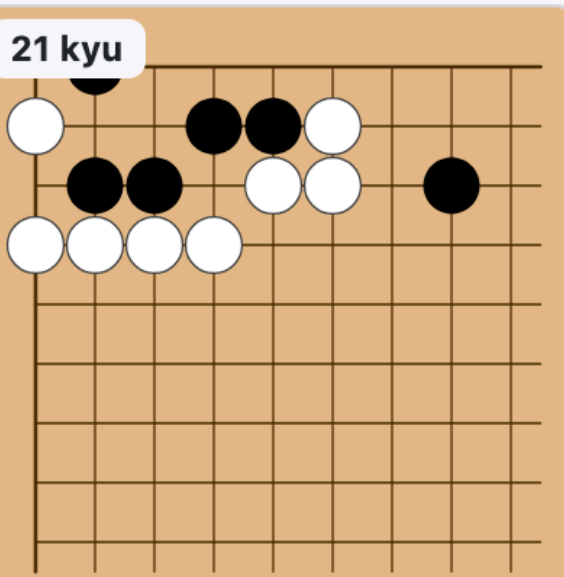
6. White to play

goproblems

Solve ▾Discover ▾Social ▾Site ▾Problems ▾

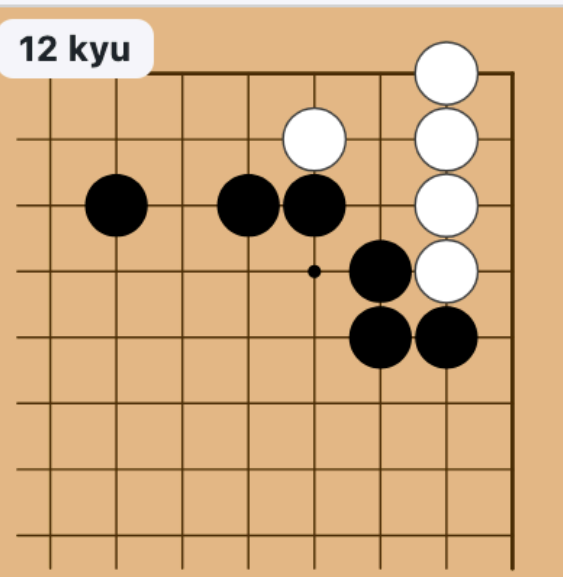
Problems of the day

21 kyu



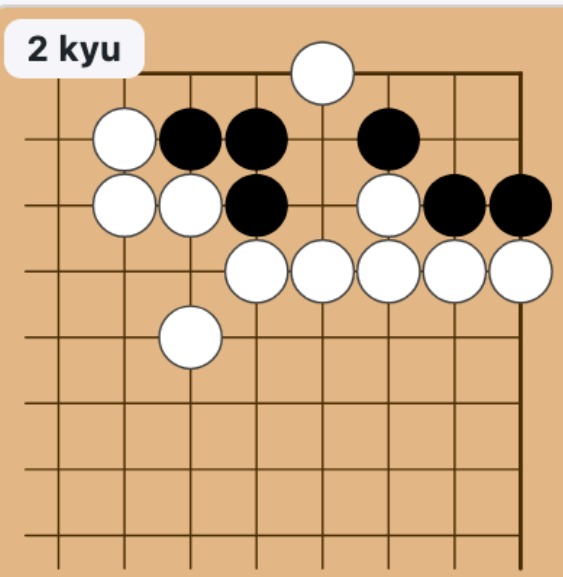
Beginner14 ✓

12 kyu



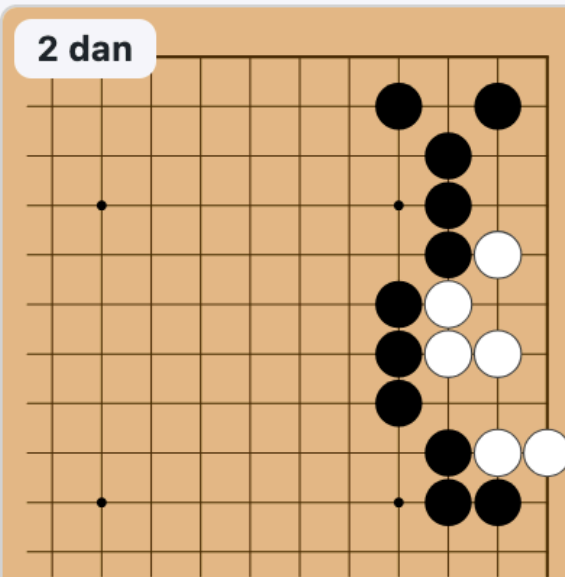
Easy13 ✓

2 kyu



Medium7 ✓

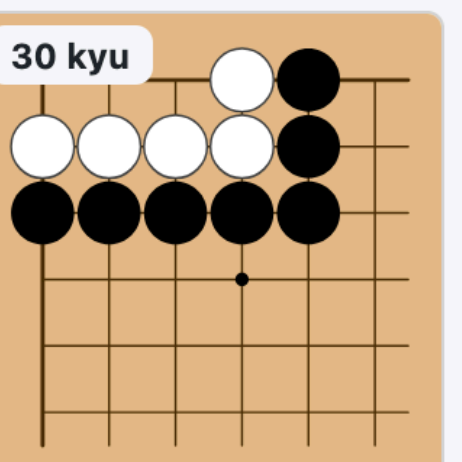
2 dan



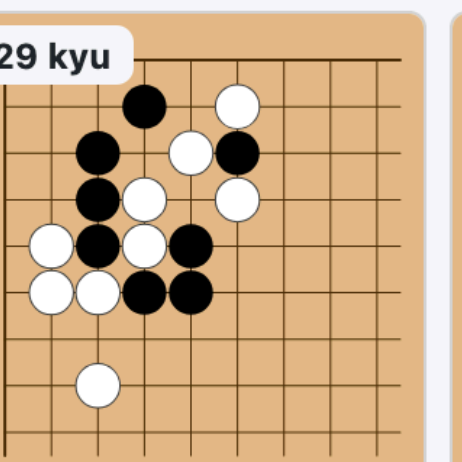
Hard4 ✓

Recommended problems

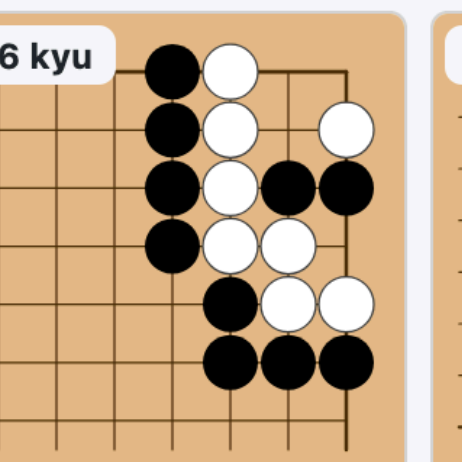
30 kyu



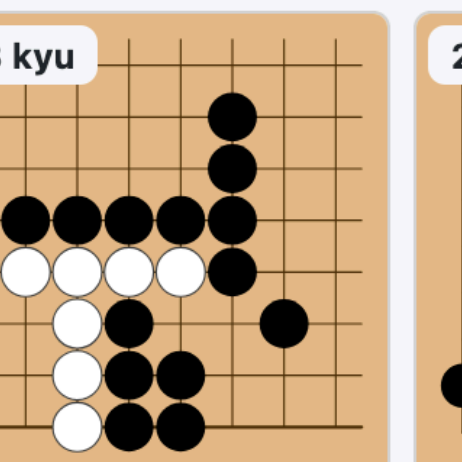
29 kyu



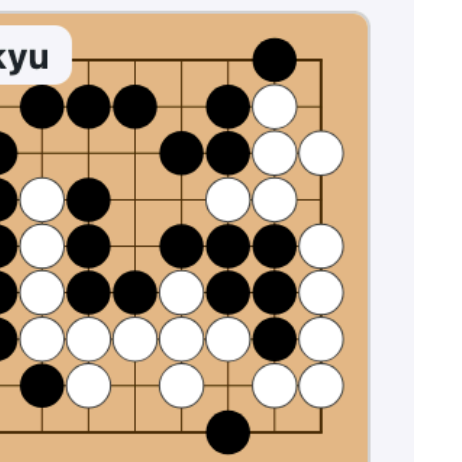
26 kyu



23 kyu



21 kyu



see all →

But... what is an Action Puzzle game?

Abstract Strategy & **Action Puzzle**



Tetris, Alexey Pajitnov (1988)

tetrisconcept.net, Fair use, <https://en.wikipedia.org/w/index.php?curid=39593835>



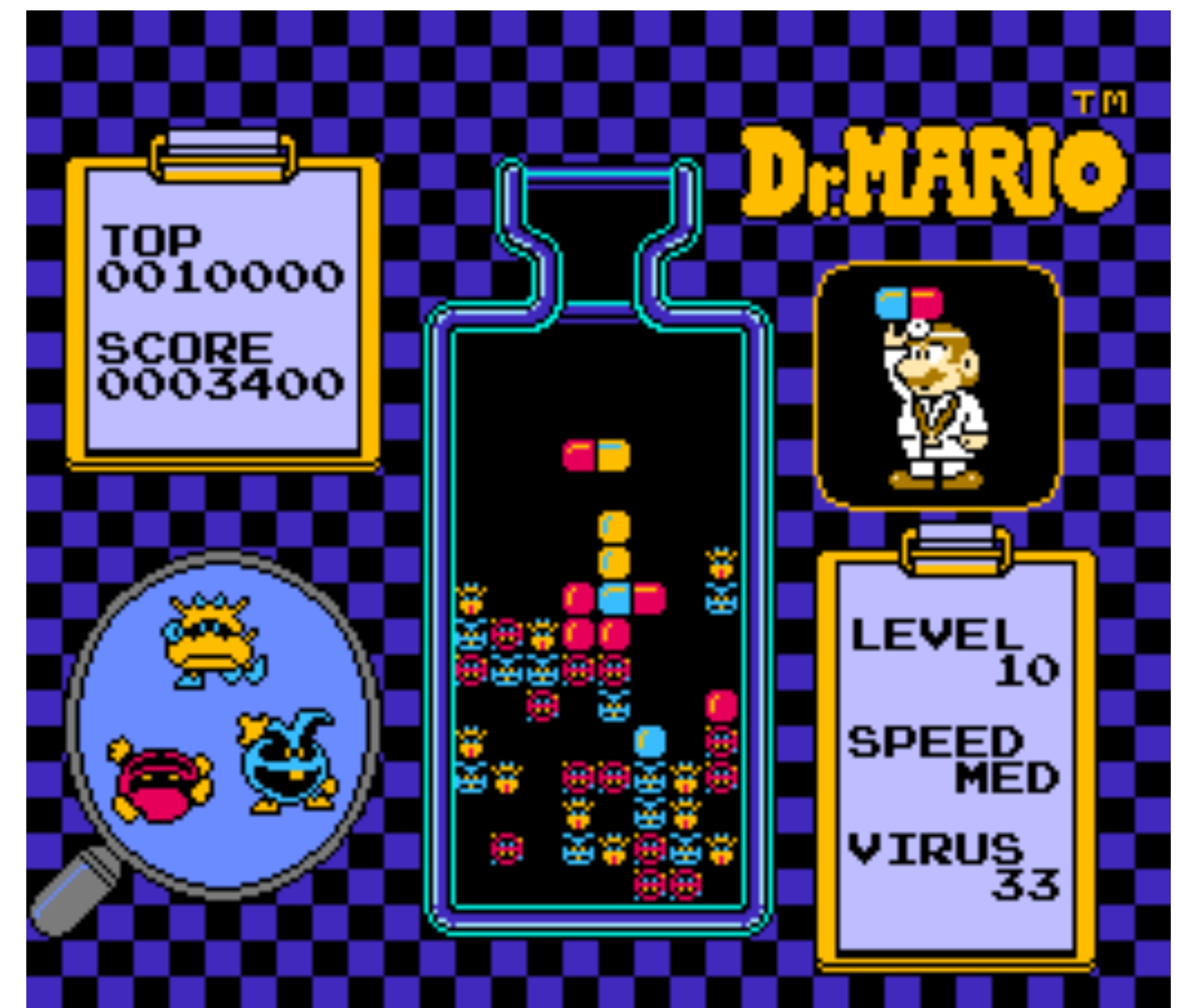
Columns, Sega (1989)

Many have falling-blocks, "Like Tetris" (or Columns)

But... what is an Action Puzzle game?

Abstract Strategy & **Action Puzzle**

- Some shared Characteristics:
 - Time-pressure
(commonly via falling blocks)
 - Game mechanics “clear the grid”,
leaving room for more blocks!
 - In Tetris it’s “fill a row without gaps”.
 - Columns and Dr. Mario use color-matching instead.



Dr Mario (1990)

But... what is an Action Puzzle game?

Abstract Strategy & **Action Puzzle**

- Many variations exist:
 - Panel de Pon / Tetris Attack
 - Uses a “cursor” rather than direct block manipulation.
 - No falling blocks, instead the time pressure comes from blocks “pushing up” from the bottom.



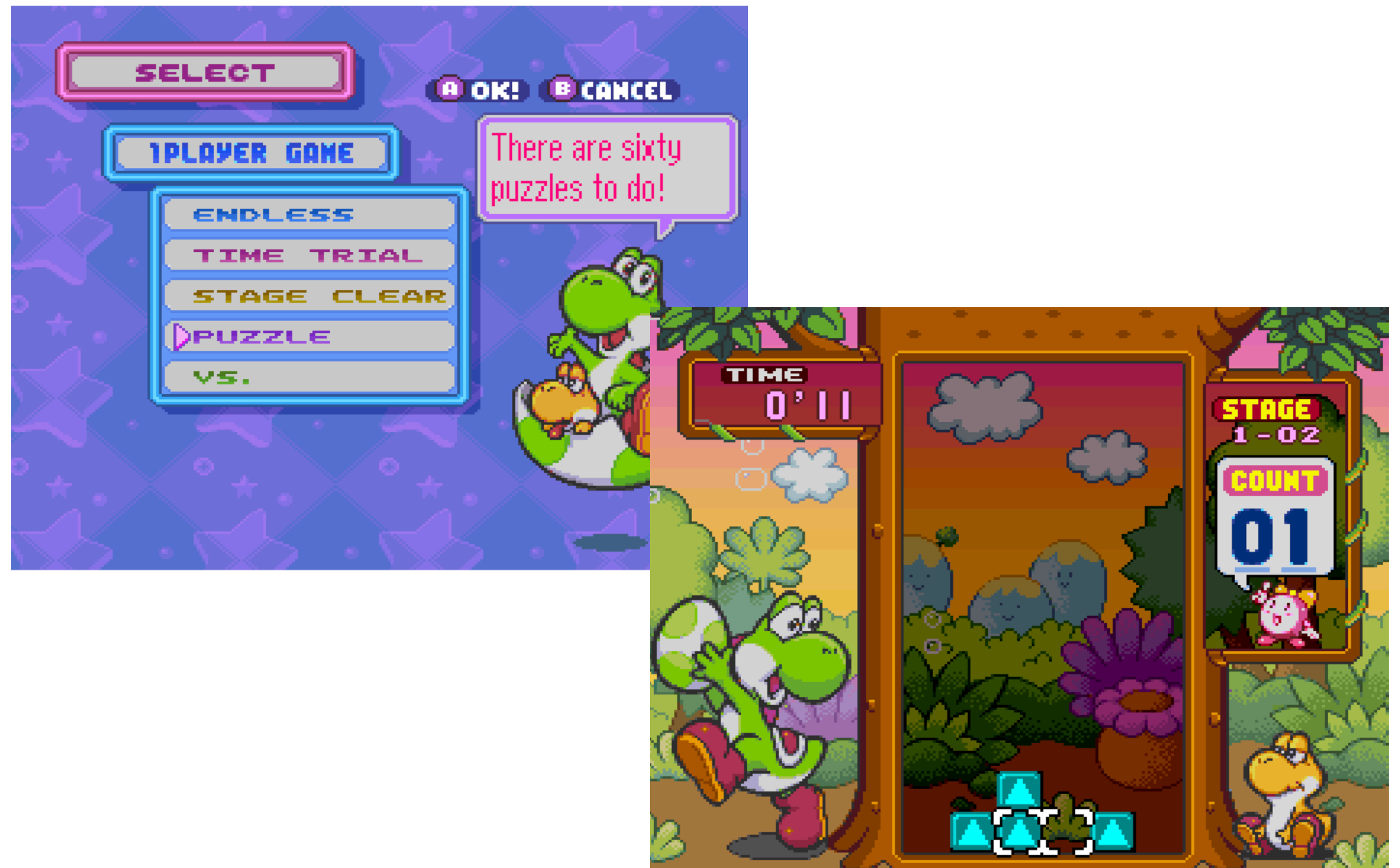
Panel de Pon / Tetris Attack, (1995) By Nintendo

[https://tcrf.net/Tetris_Attack_\(SNES\)](https://tcrf.net/Tetris_Attack_(SNES)), Fair use
<https://en.wikipedia.org/w/index.php?curid=53437094>

Action Puzzle game puzzles

Puzzle Mode in Tetris Attack

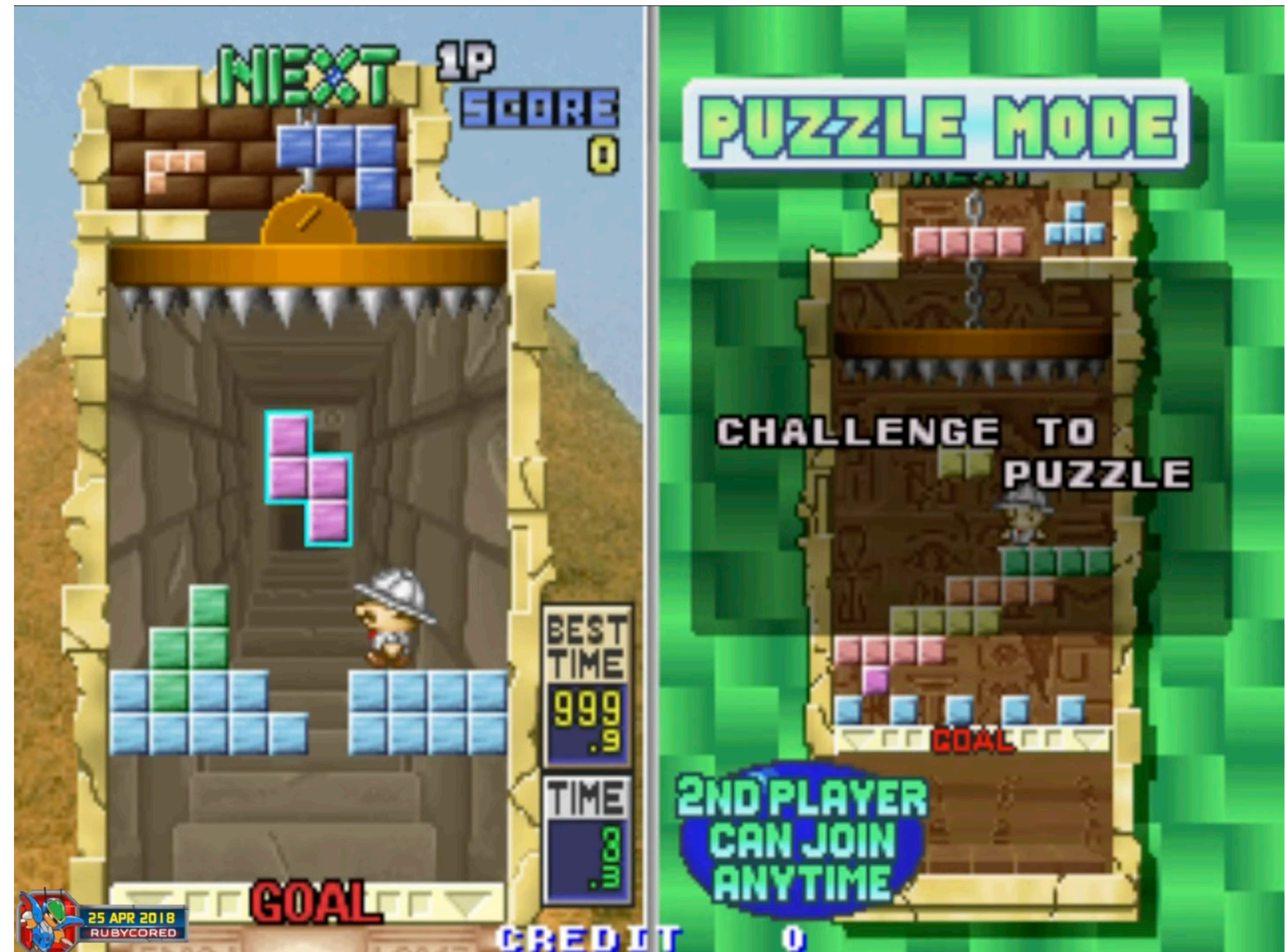
- Many of these games included a “Puzzle Mode”
 - Time-pressure removed
 - Clearing the grid is the goal
 - Often these were a sort of tutorial – these modes would teach you techniques you could use during the main game loop.



Action Puzzle game puzzles

Puzzle Mode in Tetris Plus

- Tetris Plus (1996)
 - Arcade
 - Puzzle mode still had time-pressure
 - The goal was to clear lines to let the character fall and reach the goal line at the bottom of the screen



Side-quest on Game taxonomy –

What are puzzle games?

Side-quest on Game taxonomy –

- A “puzzle” consists of:

1. Its presentation

and

2. A solution

- When there is only one *unambiguous* solution, especially when there aren't a lot of steps to find the solution, I'll sometimes refer to these as “discreet puzzles”.



Side-quest on Game taxonomy –

Puzzle Modes are not the point of this talk...

- The games I'm interested in are played by solving a recursive sequence of puzzles indefinitely.

Side-quest on Game taxonomy

Amabel Holland asserts that a puzzle is a type of game, and then asks:
If puzzles are a type of game, are games a type of puzzle?

“It feels good when someone figures out how to deal with what you’ve thrown at them. The aha moment, the *Eureka!*, that feels good for *them*, it feels good for you too.

I think that’s because they’re on your wavelength. They’ve come to understand you, and read you. It’s an act of mutual communication.”

Side-quest on Game taxonomy

- “Action Puzzle” is not a universally recognized genre.
- When searching “What kind of game is Tetris?” you can find a reddit post where someone poses the question, and none of the 25 responses use the term.
- But term “Puzzle Game” is too broad to be especially useful.
- It includes many other subgenres.
- It doesn’t specify anything about “What kind of puzzle?”, or “How is the puzzle presented?”

Side-quest on Game taxonomy

- I now think of Tetris as the first*:

Recursive Puzzle Video Game

* At the very least, it was the first one I played.

And of course, before it, I'd played many board games that I now also consider recursive.

So what do I mean by “Recursive”?

One puzzle leads to another...

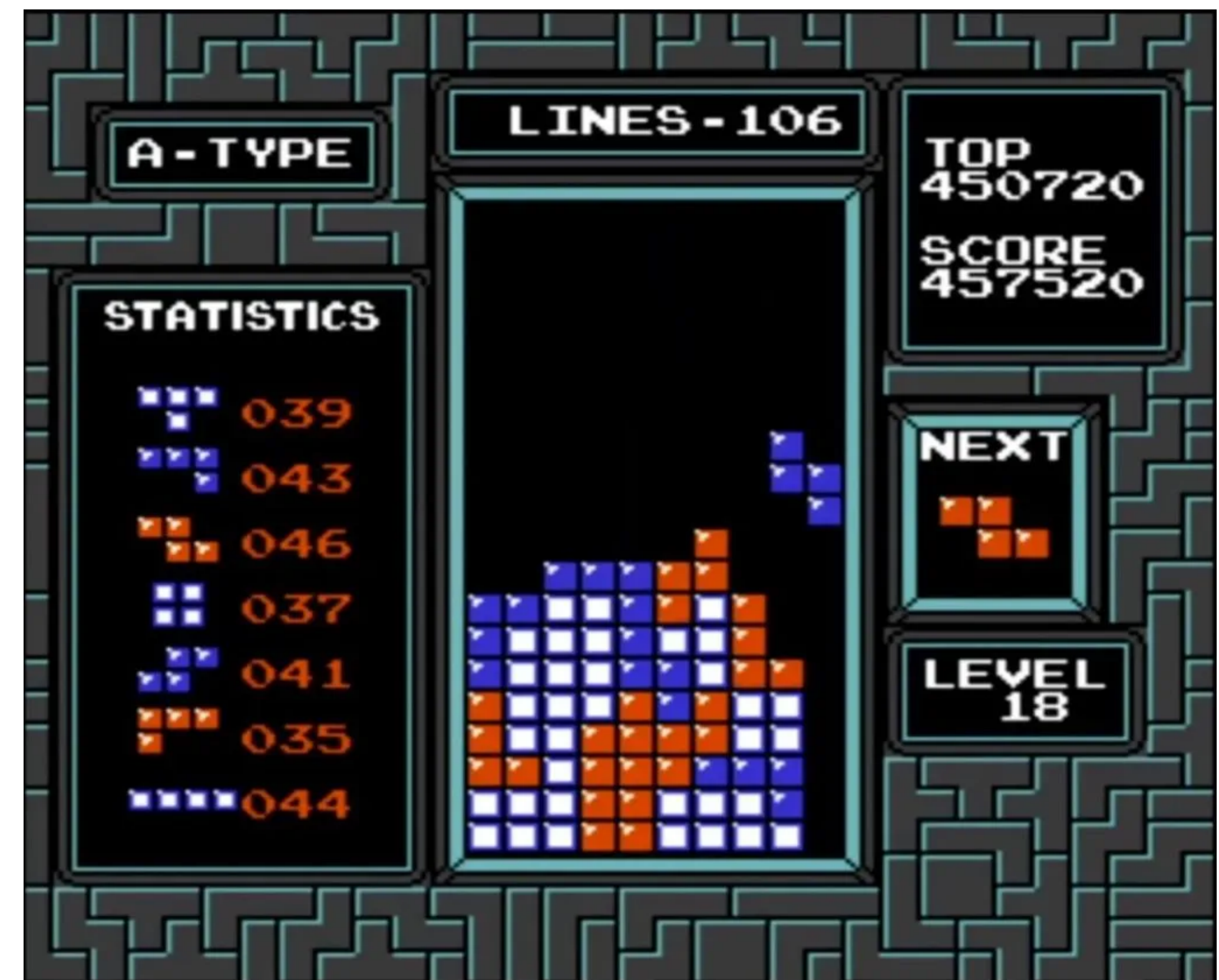
Recursion occurs when the definition of a concept or process depends on a simpler or previous version of itself.

So what do I mean by “Recursive”?

One Tetris puzzle leads to another...

Think of each falling block in Tetris as its own puzzle.

The board is essentially the same, except for the addition of the previously dropped block.



About Recursion



One abstract strategy puzzle leads to another...

“A good abstract game can therefore be thought of as a "family" of potentially interesting logic puzzles, and the play consists of each player posing such a puzzle to the other.”

J. Mark Thompson, *Defining the Abstract* (2000)

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About Recursion



One abstract strategy puzzle leads to another...

Each turn is a new puzzle in sequence.

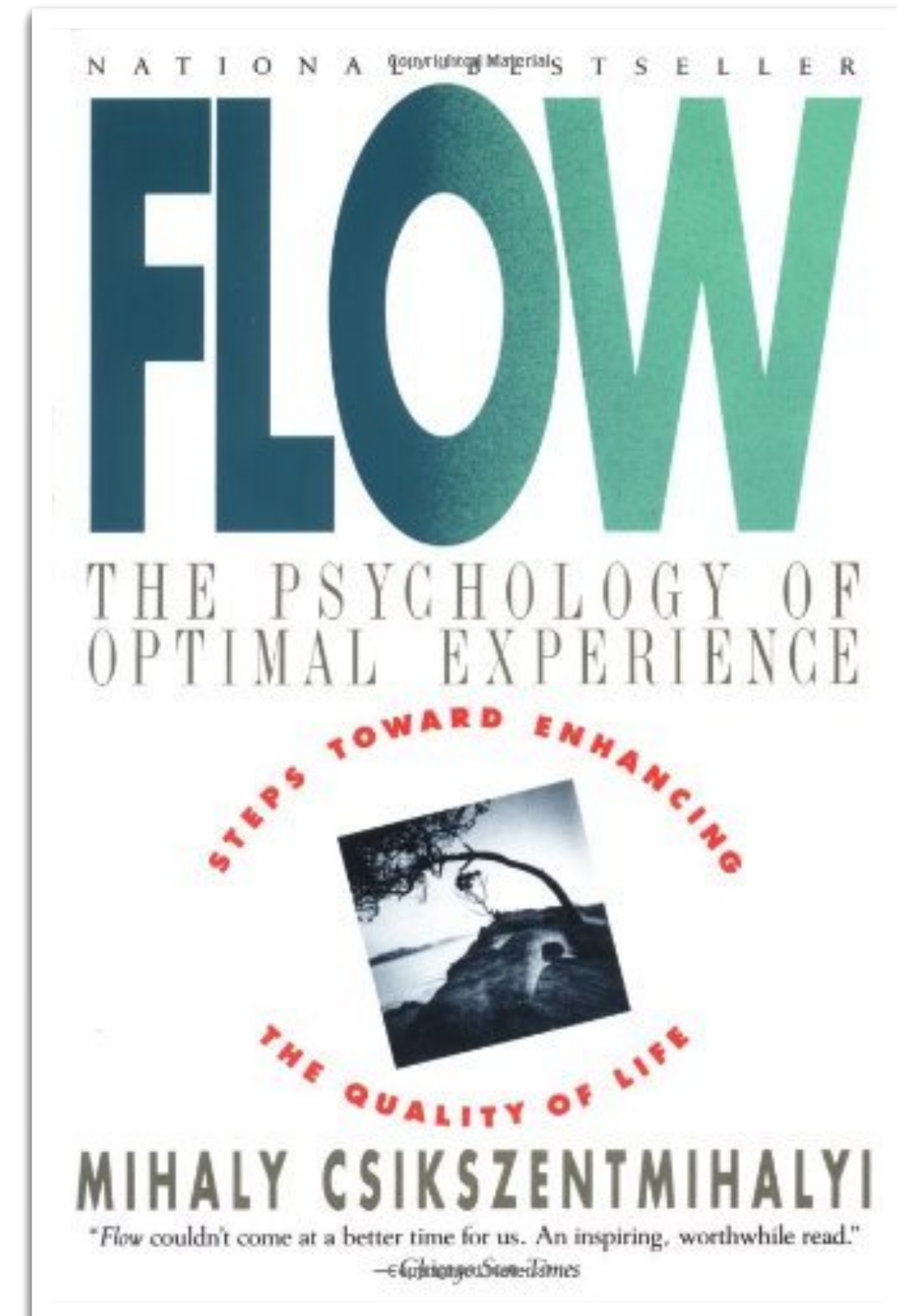
The majority of the board is the same as the previous turn.

The only difference is whatever an opponent did to change it.

About Flow

Maximizing joy

- In his seminal book on this topic from 1990, Mihaly Csikszentmihalyi describes seemingly every pleasurable and compelling human activity as leading to “flow state”.
 - Physical activity: Yoga, Martial arts, Sex
 - Pleasurable senses: Sight, Music, Taste
 - Science / Wisdom / Understanding
 - And yes: Games



About Flow

But what is it?

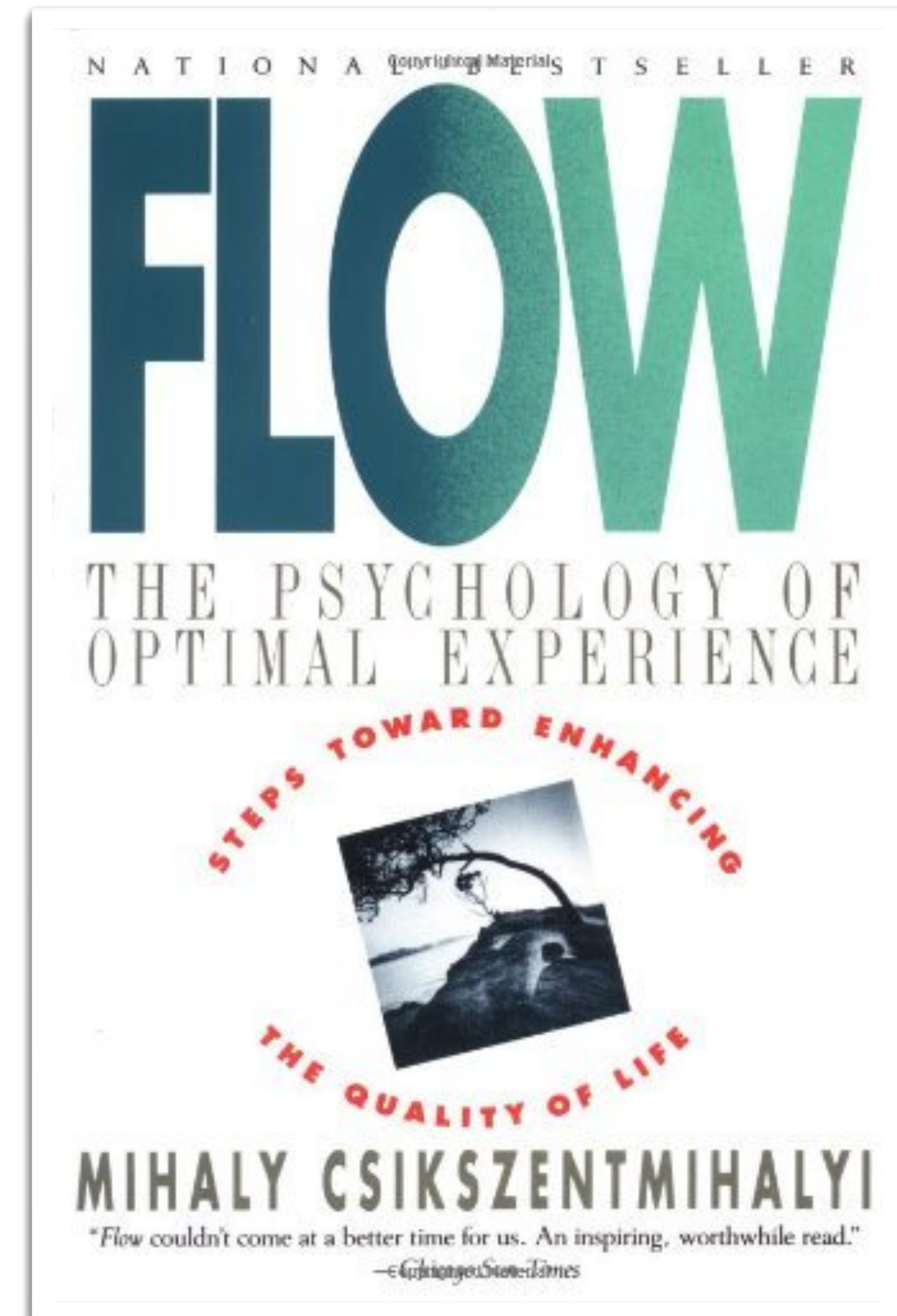
- “We have called this state the flow experience, because this is the term many of the people we interviewed had used in their descriptions of how it felt to be in top form:

"It was like floating,"

"I was carried on by the flow."

”*

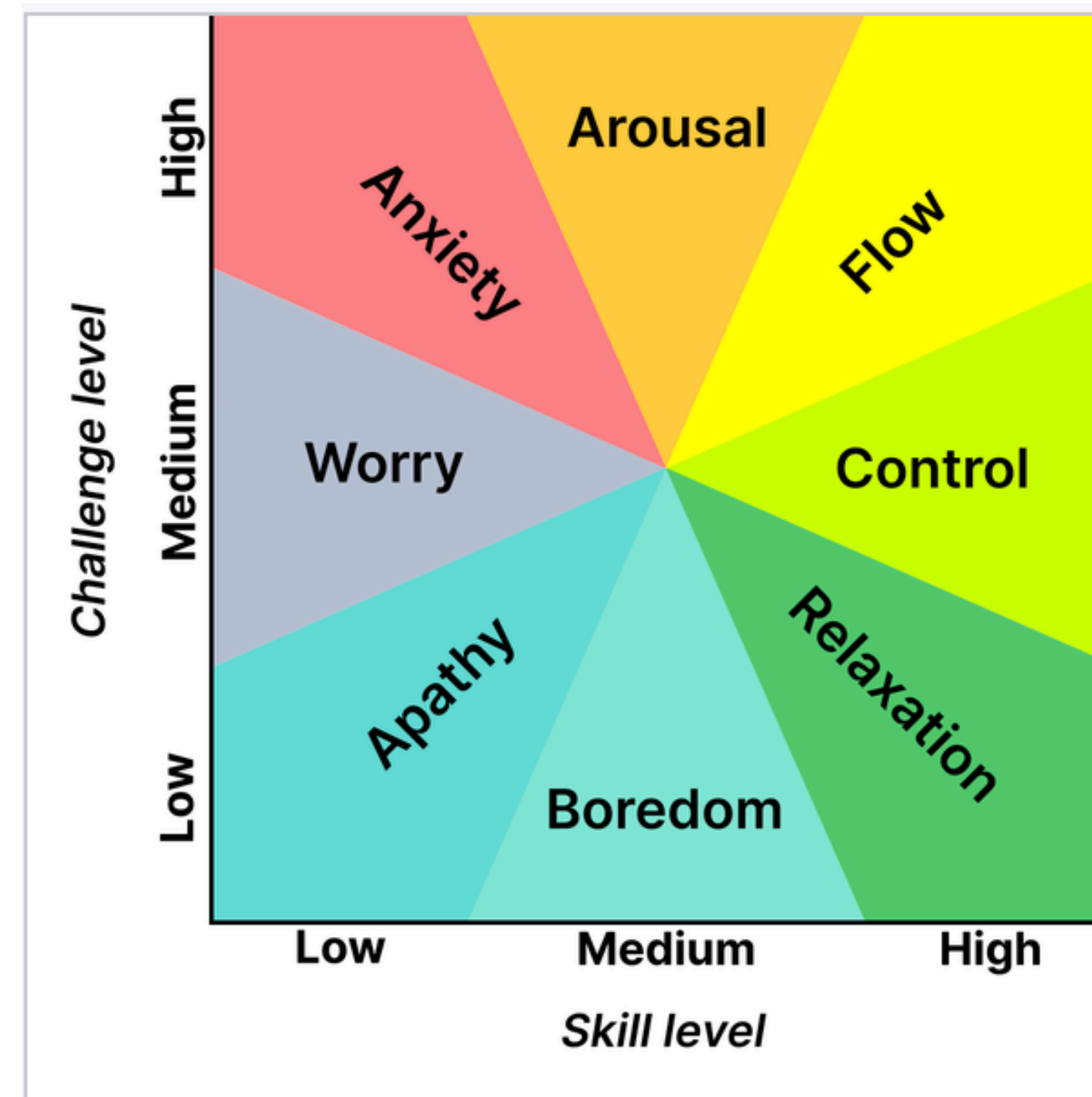
* from *Flow* (1990)



About Flow

Later writing* identified these 2 key requirements:

1. Optimal challenge
2. High self-motivation



Mental state in terms of challenge level and skill level, according to Csikszentmihalyi's flow model.

* ["Advancing our understanding of psychological flow: A scoping review of conceptualizations, measurements, and applications"](#), a 2021 paper by Norsworthy, Cameron; Jackson, Ben; Dimmock, James A

About Flow

...and these characteristics:

1. Absorption:
focused, undistracted attention, a merging of action and awareness
2. Effort-less control:
fluidity of performance and an absence of concern over losing control
3. A distortion of temporal experience:
subjective experience of time is altered

About Flow

The Tetris Effect

- Tetris is notorious for inducing flow.
- People who play Tetris for extended periods report seeing the shapes even when they aren't playing:
 - When they close their eyes.
 - When looking at buildings or store shelves.
- One theory says that this is proof of brain elasticity. Our brains can be physically changed by playing Tetris.



About Flow

Personally...

- In addition to Board Games and Video Games, I've experienced flow:
 - Focused on work tasks (computer programming)
 - While juggling (specifically, while in the repetition of learning a new skill / trick)

Games that optimize Flow

Lumines: Puzzle Fusion (2004)

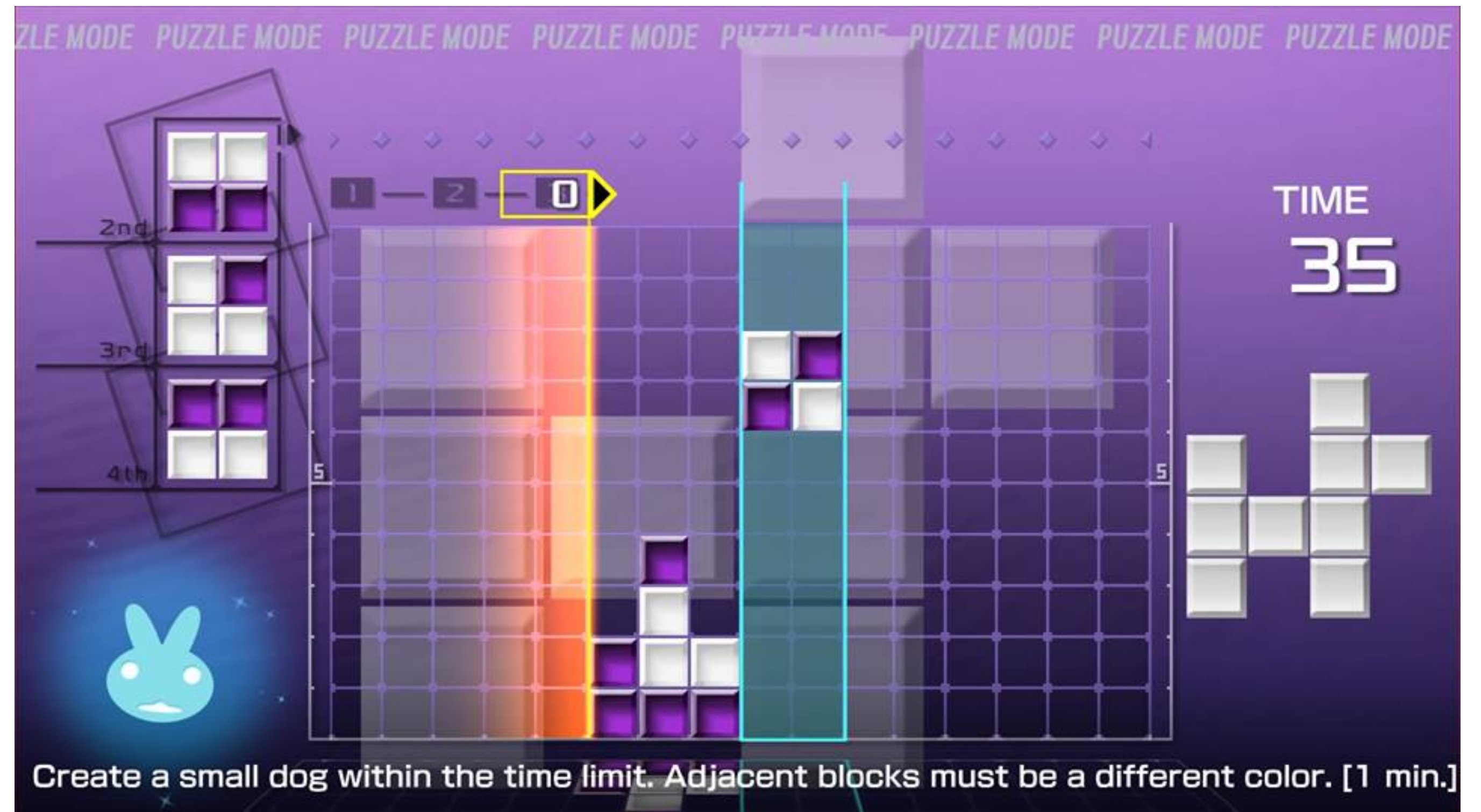
- Unique timeline mechanic where blocks “break” with a constantly moving line that move across the playing field to the music.
- Highly dynamic and reactive visuals and audio



Games that optimize Flow

Lumines: Puzzle Fusion (2004)

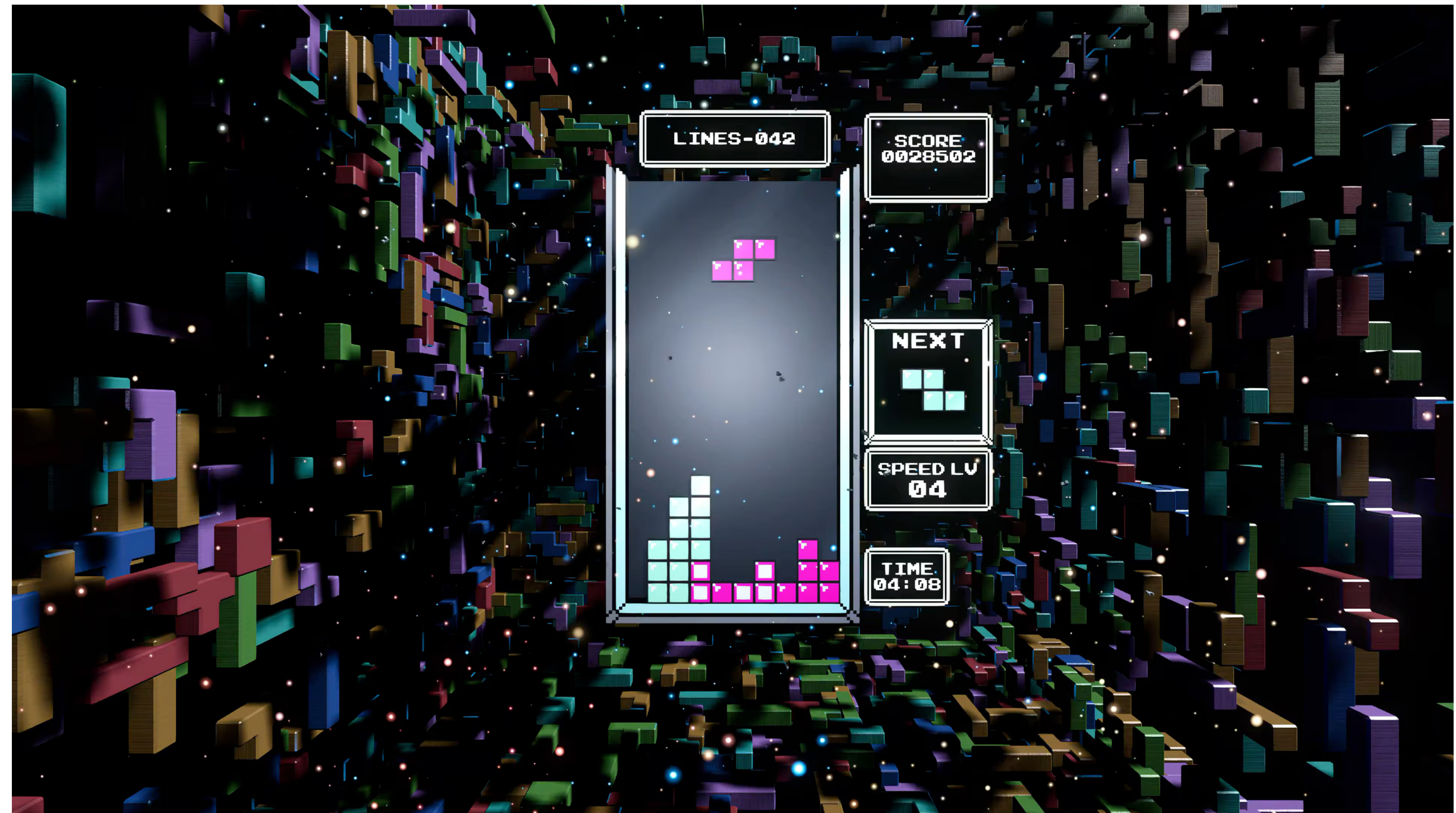
- Also included a puzzle mode!



Games that optimize Flow

Tetris: Effect Connected (2018)

- The same team that created Lumines.
- Many consider this to be the best version of Tetris ever made.
- Highly stimulating, with music, audio effects, and visual effects, that change and react as you play.
- Includes VR support. Clearly “immersion” was a goal in development.



Games that optimize Flow

Extra sensory stimulation

- Both of these games optimize for flow by providing additional sensory stimulation.
- This helps to “drown out” any sensory input that is not relevant to playing the game.
- VR can also have this effect because you are literally being prevented from seeing anything not a part of the game.



Games that optimize Flow

Abstract Strategy games

- It's understood while playing Chess that players need a quiet environment to focus.
- Talking is discouraged at tournaments.
- Even casual play can require patience you don't often need in everyday life.



Repetition of logical puzzles
in games leads to Flow

Repetition of logical puzzles
in games leads to Flow

Flow is pleasurable.

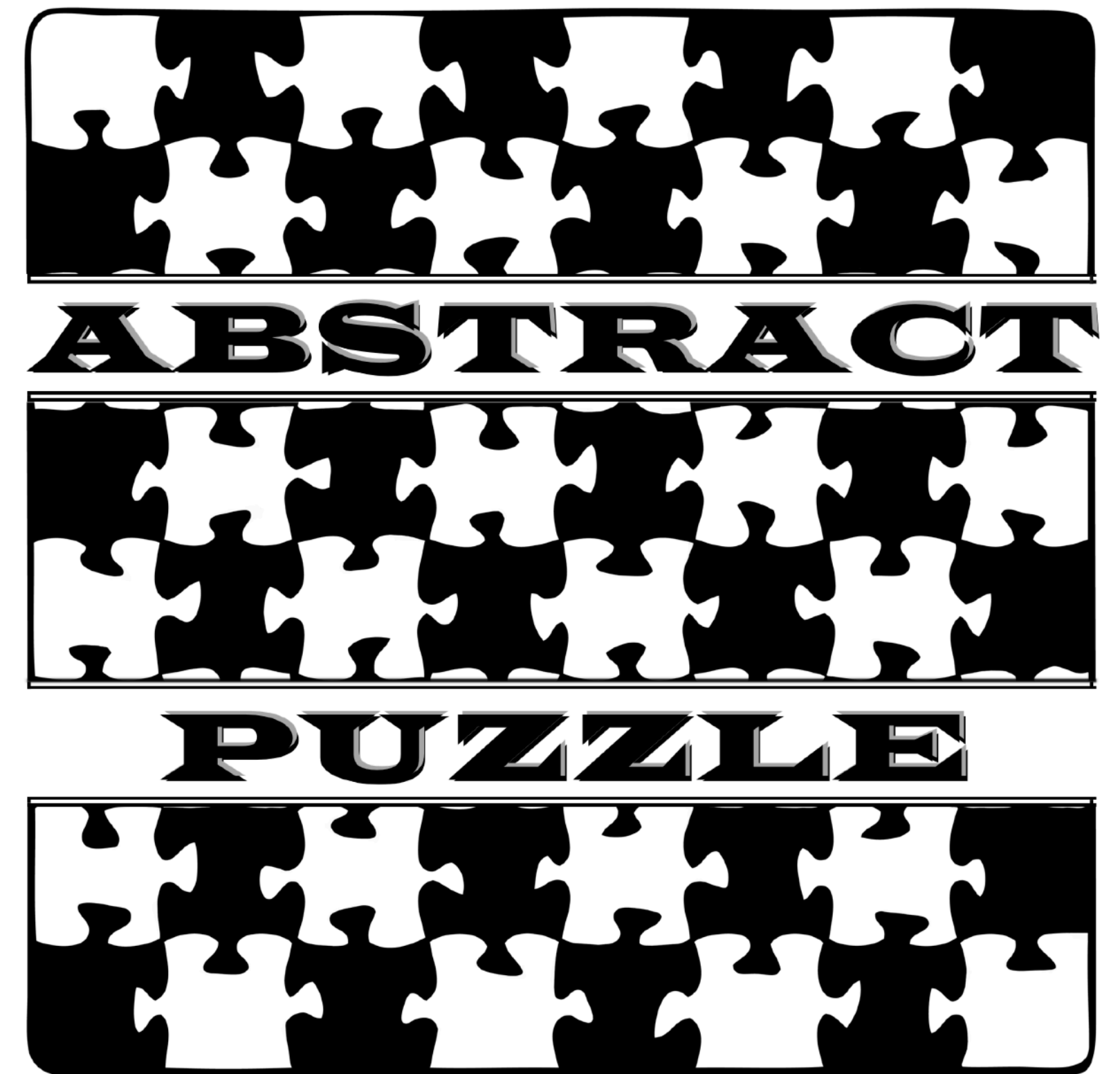
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About myself and Abstract Puzzle

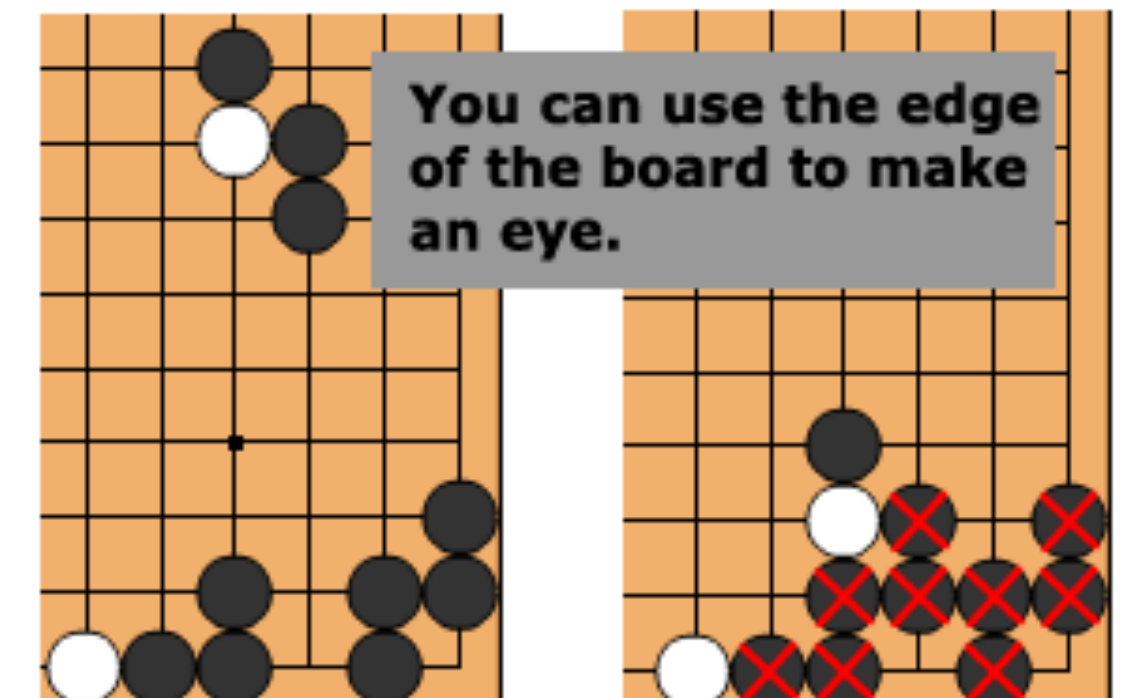
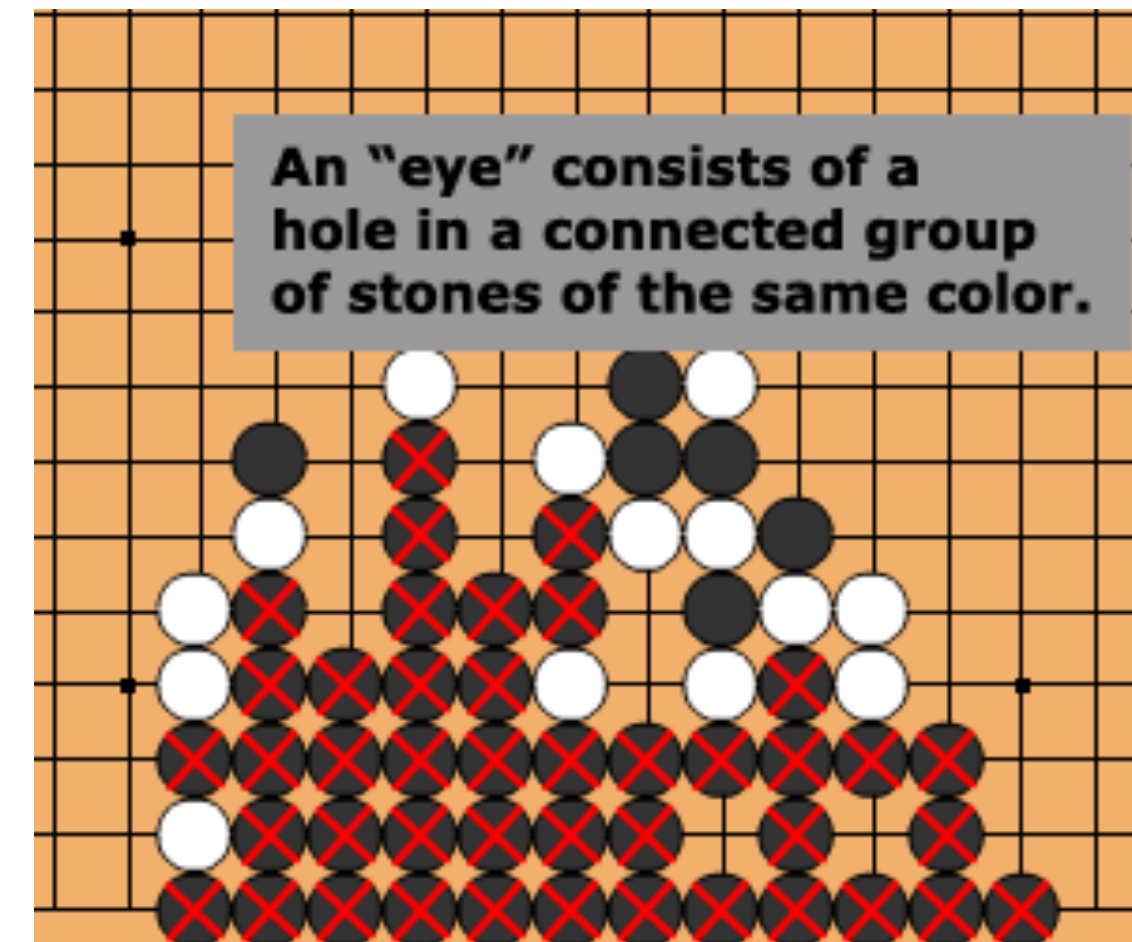
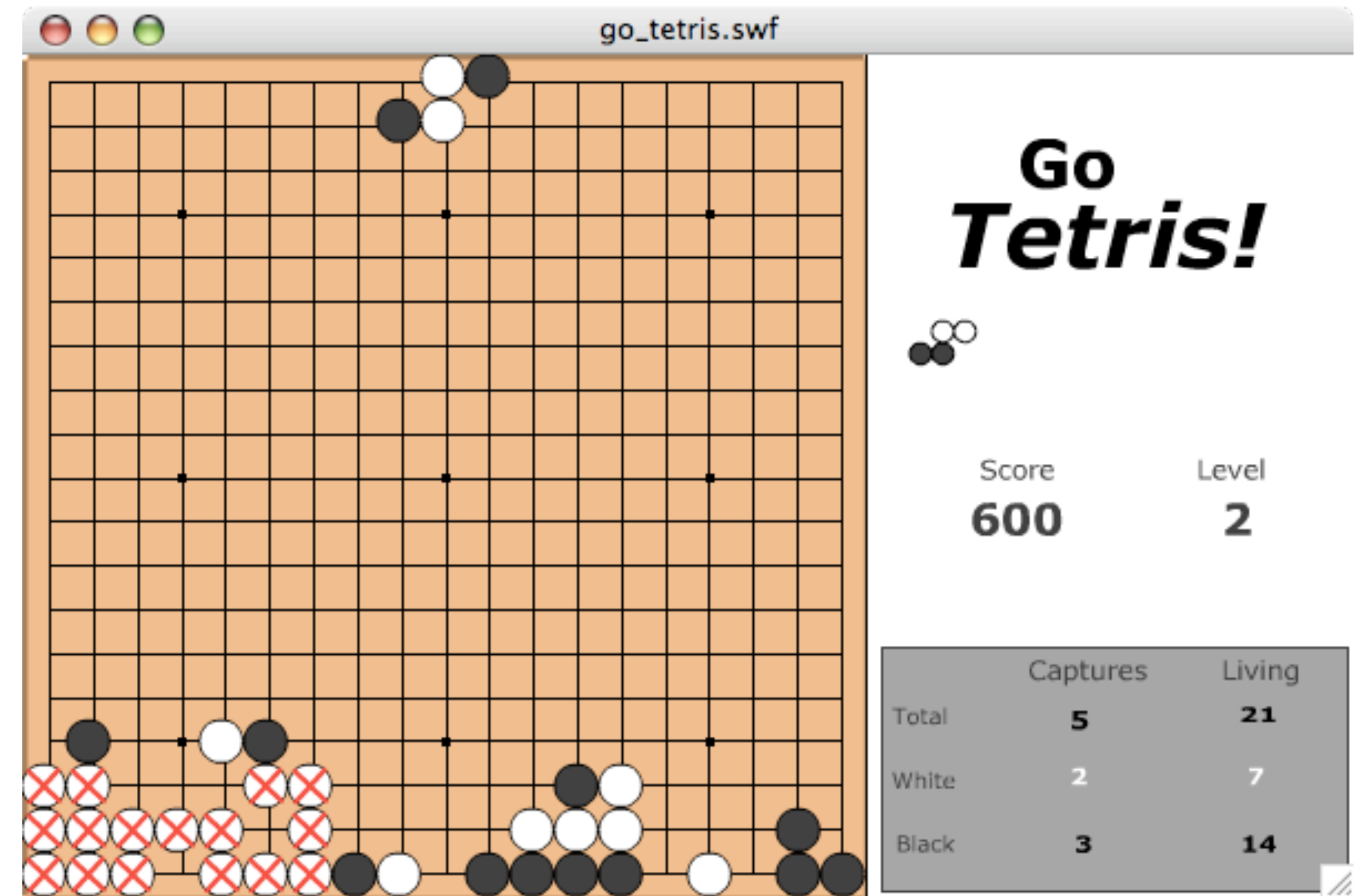
Abstract Strategy & Action **Puzzle**

- My first video games were genre mashups

Abstract Puzzle

Abstract Strategy & Action Puzzle

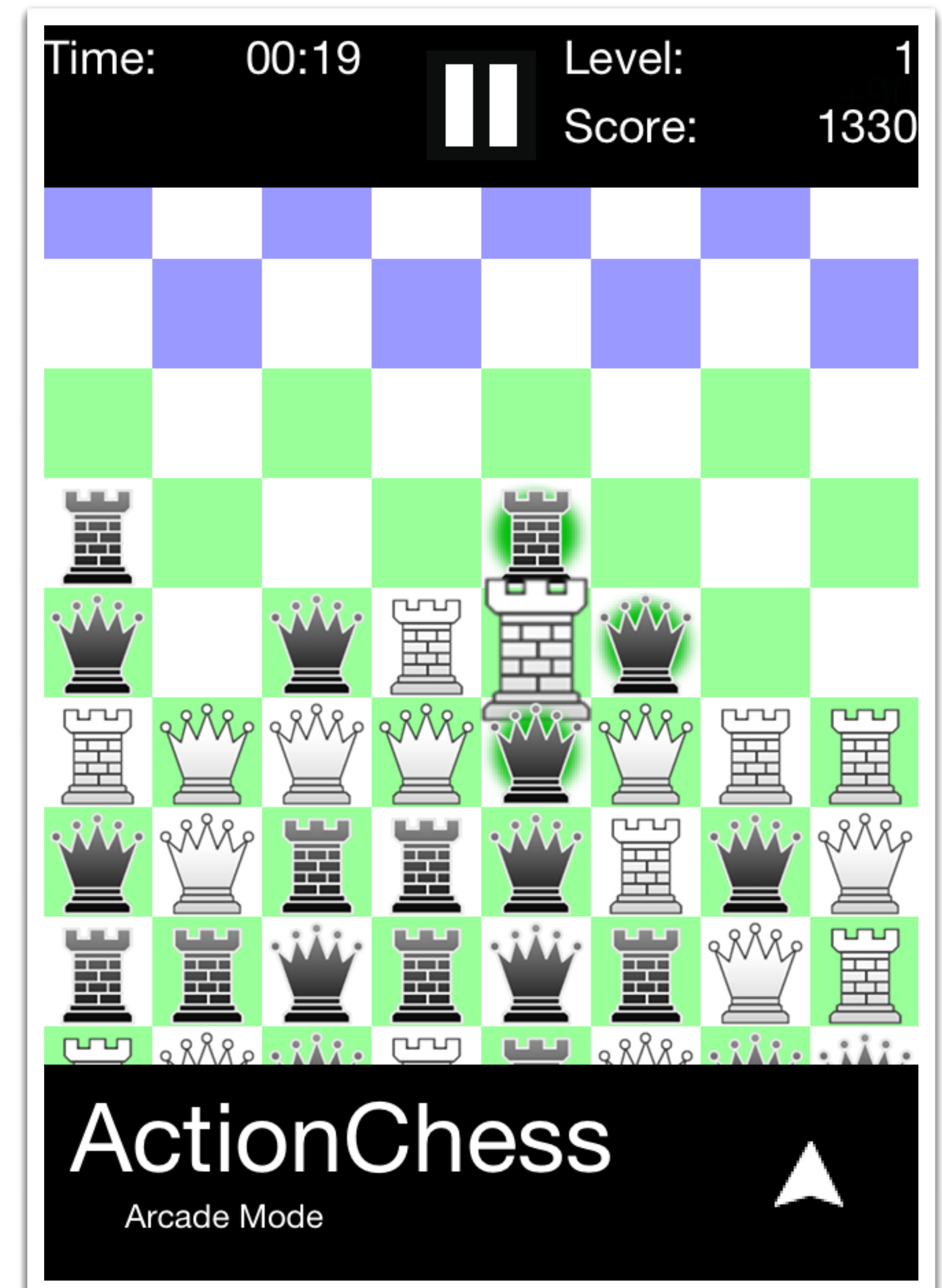
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- **Go-Tetris** (2007)



Abstract Puzzle

Abstract Strategy & Action **Puzzle**

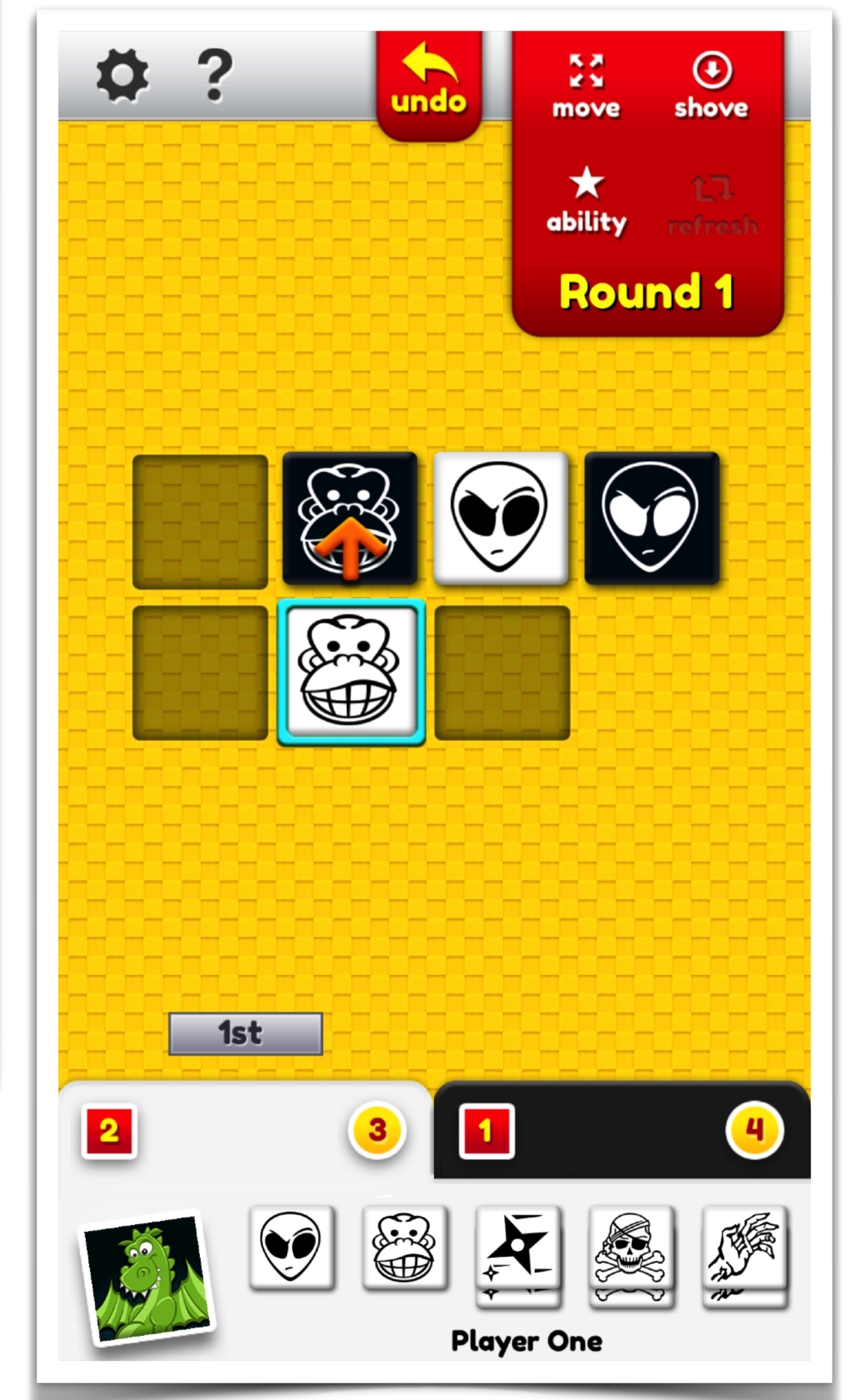
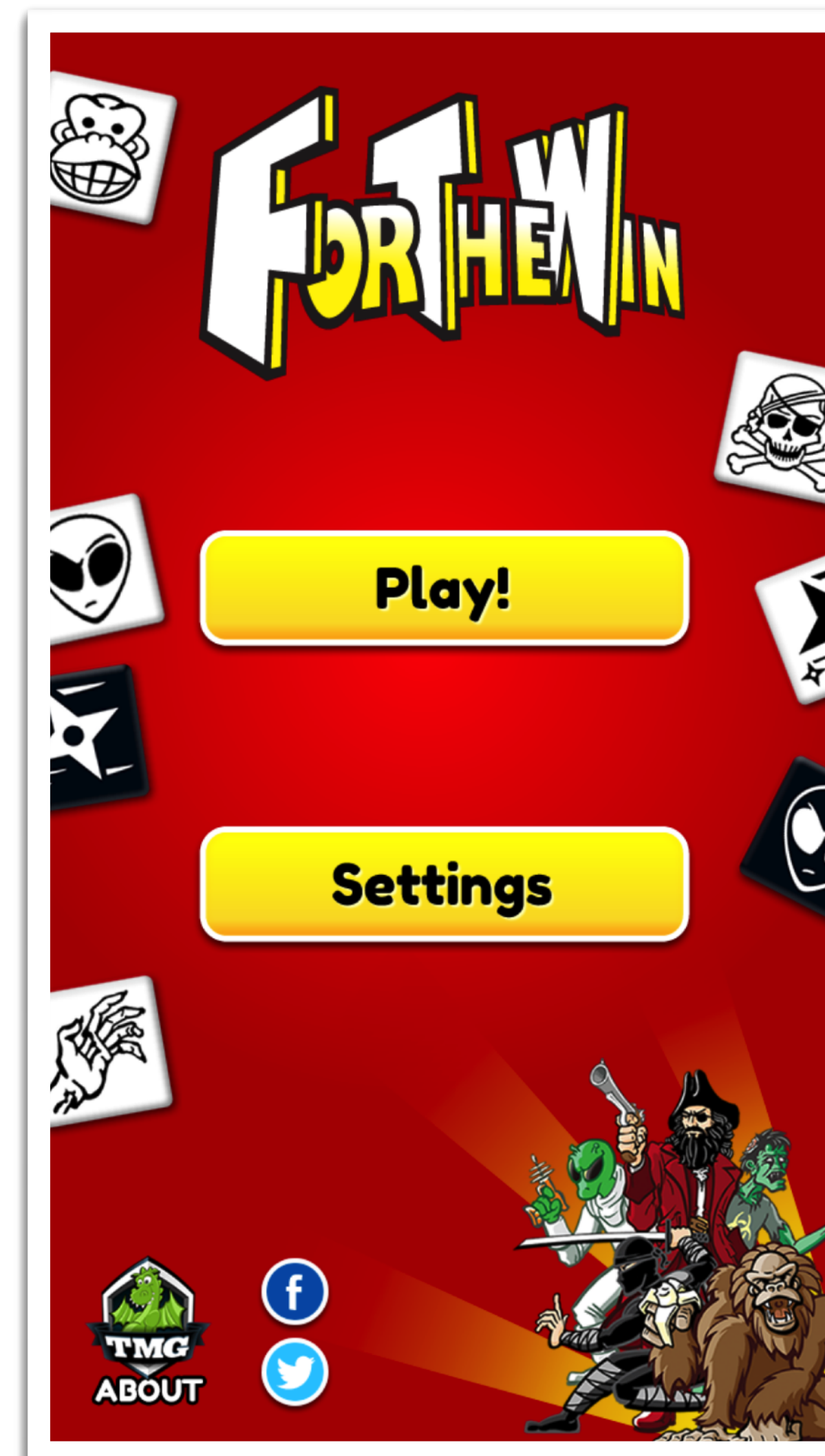
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- Go-Tetris (2007)
- **ActionChess** (2009)



Abstract Puzzle

Abstract Strategy & Action **Puzzle**

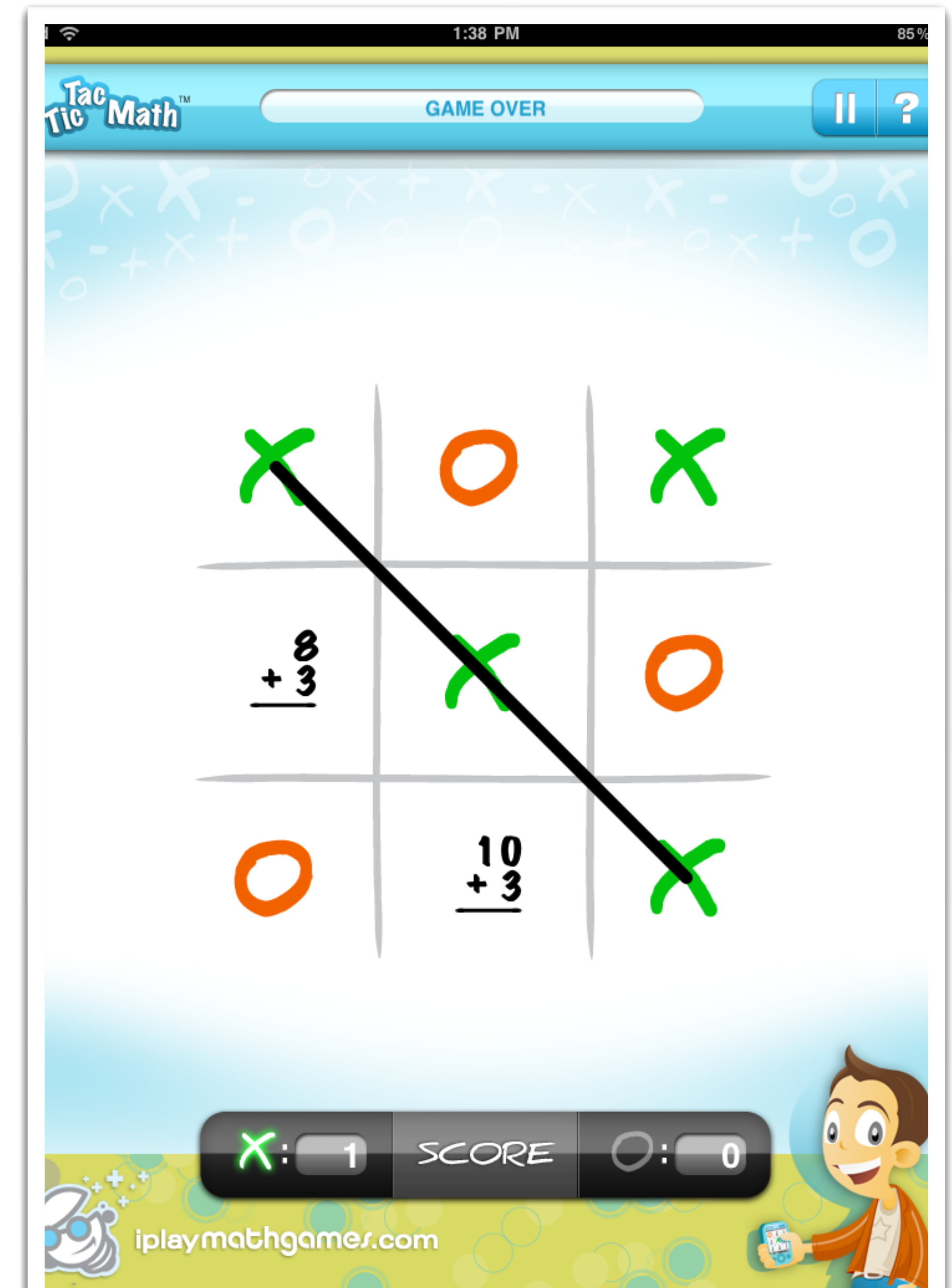
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- I quit my job, forming Abstract Puzzle, to take on client projects like:
 - **For The Win** (2012)



Abstract Puzzle

Abstract Strategy & Action **Puzzle**

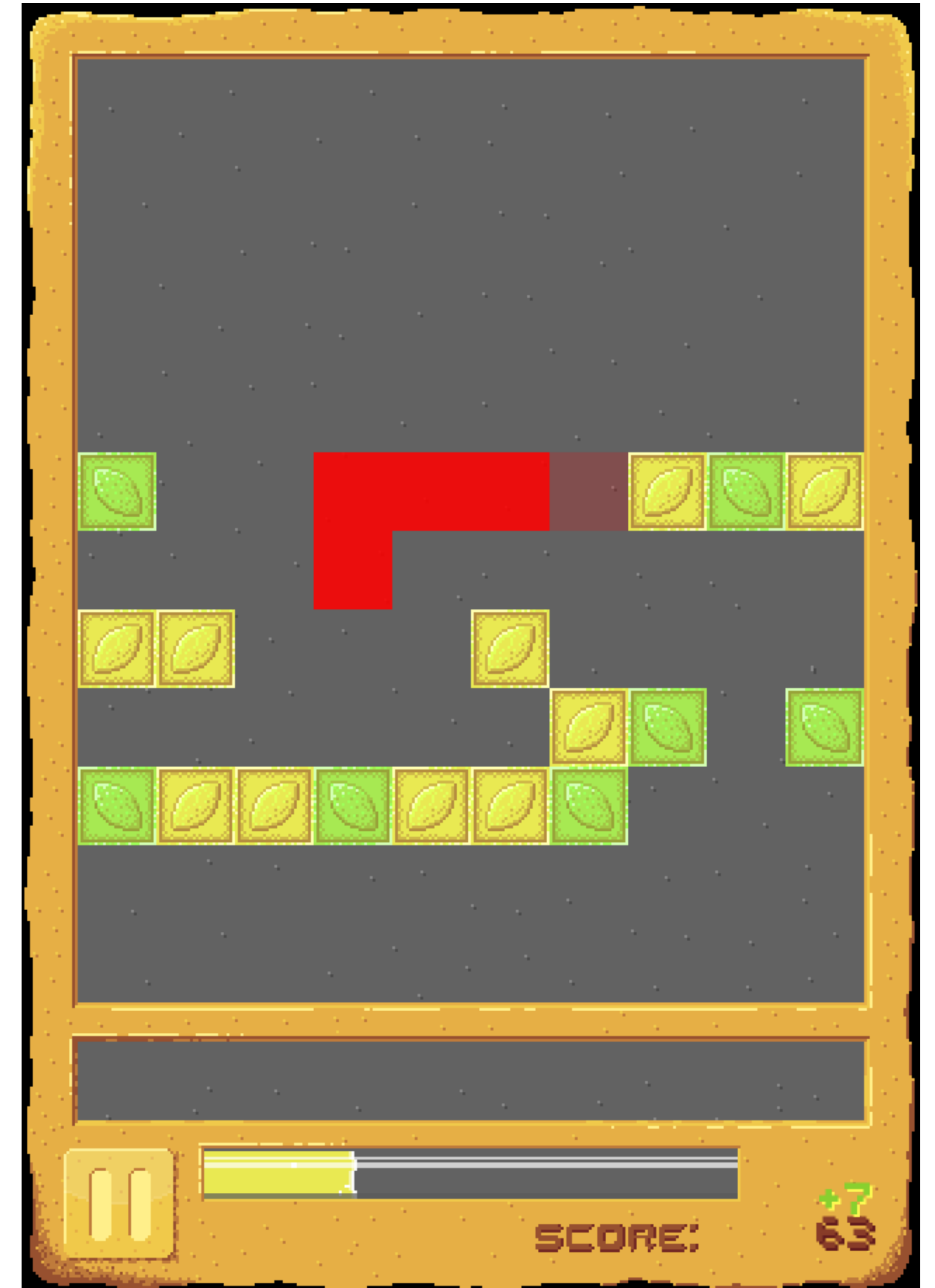
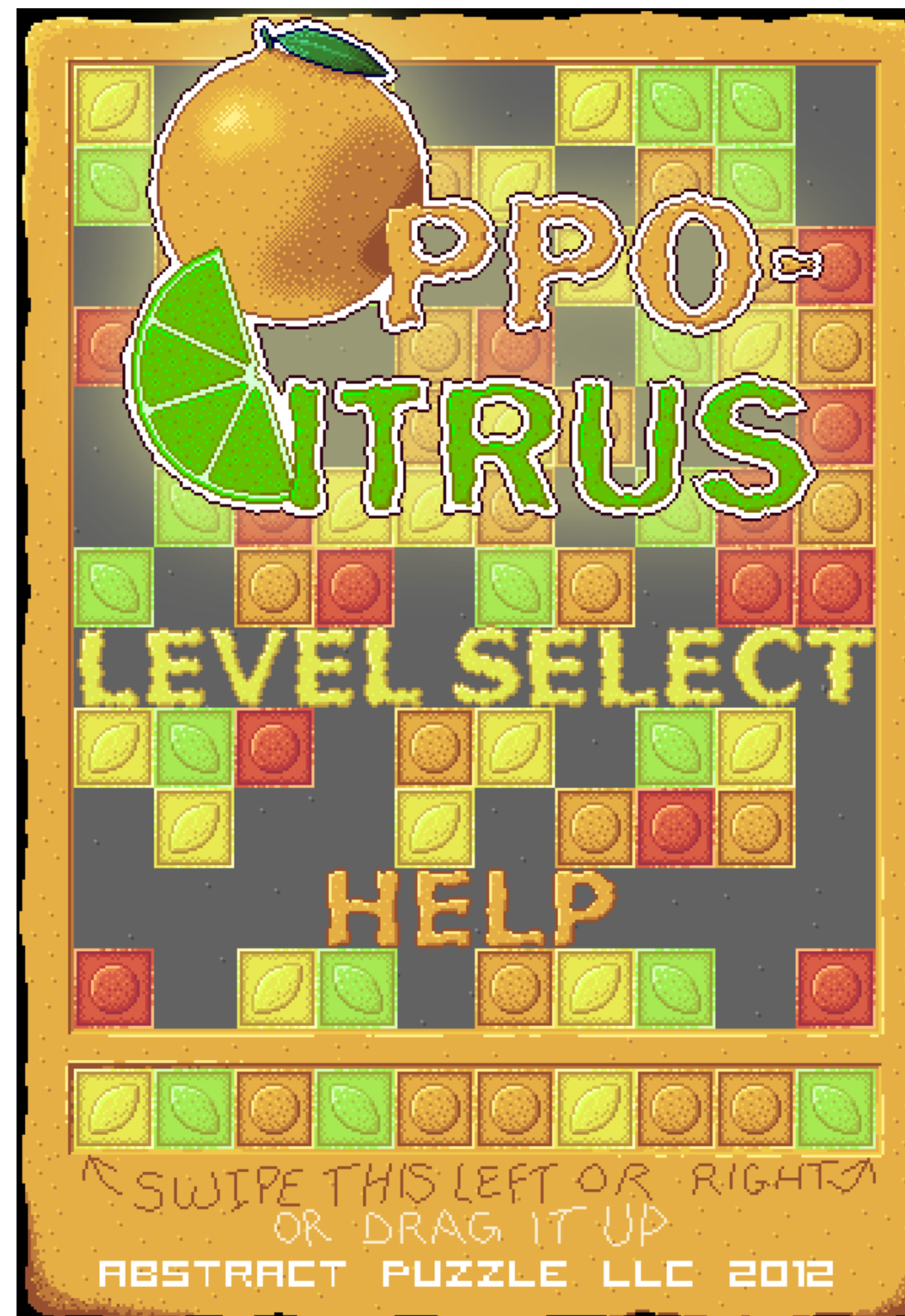
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 - **Tic Tac Math** (2015)



Abstract Puzzle

Abstract Strategy & Action **Puzzle**

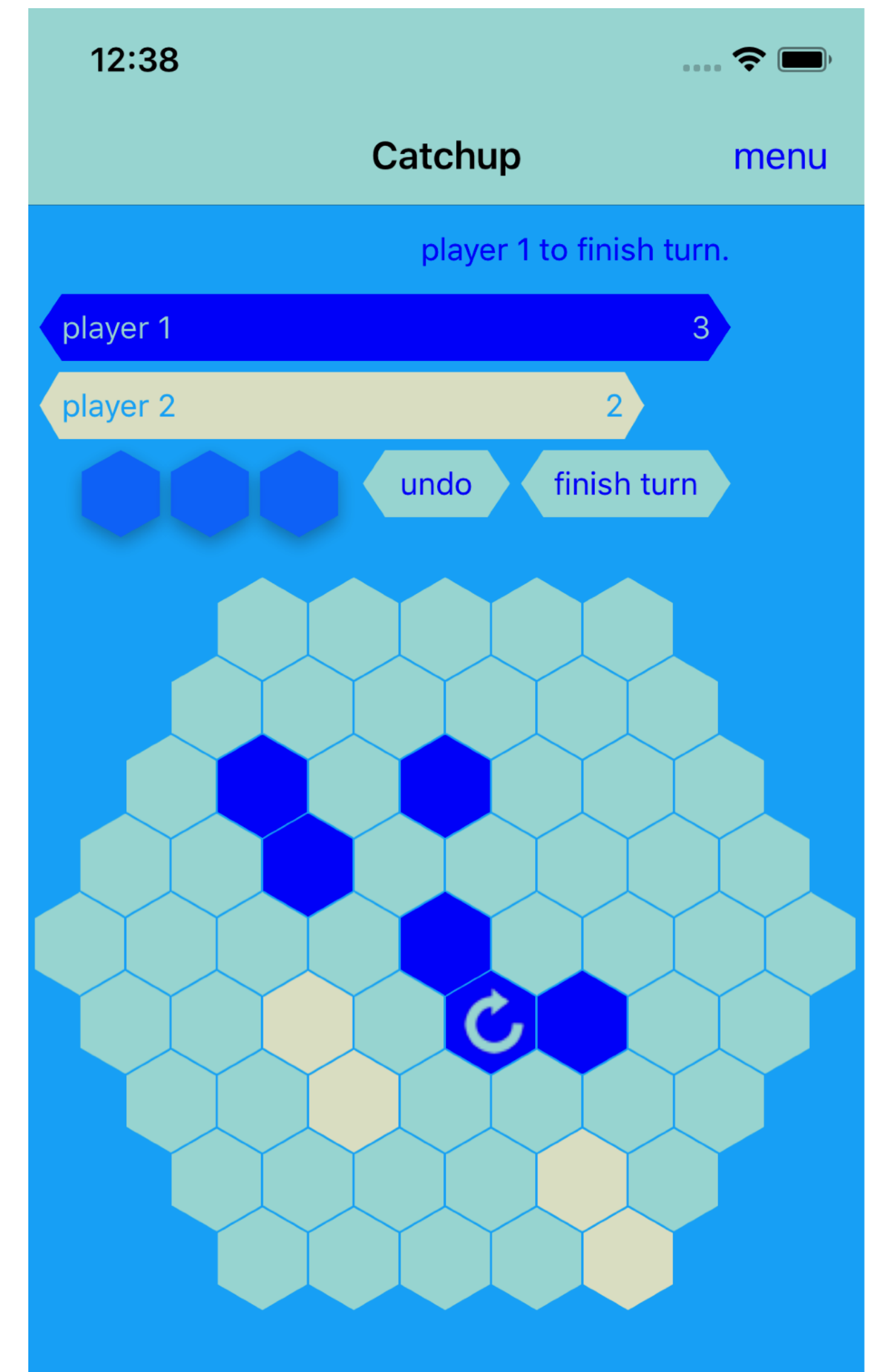
- Other games I've worked on
 - **Oppo-Citrus** (2012)



Abstract Puzzle

Abstract Strategy & Action **Puzzle**

- Other games I've worked on
 - Oppo-Citrus (2012)
 - **Catchup** (2014)



Thank you!

Martin Grider

- Blog / Go-Tetris:
<http://chesstris.com>
- Game links & studio:
<http://abstractpuzzle.com>
- Resume:
<http://martingrider.name>
- Current tabletop project:
<http://chesscubes.com>

I recommend:

- Go Puzzles:
<https://www.goproblems.com/>
- J. Mark Thompson, Defining the Abstract (2000)
<https://web.archive.org/web/20001018073731/http://www.thegamesjournal.com/articles/DefiningtheAbstract.shtml>
- Amabel Holland, Board Games As Puzzles: Problem Design & Player Agency (2024)
<https://www.youtube.com/watch?v=f697KVbaeyk>
- Reading about Flow:
[https://en.wikipedia.org/wiki/Flow_\(psychology\)](https://en.wikipedia.org/wiki/Flow_(psychology))
- Reading about the Tetris Effect:
https://en.wikipedia.org/wiki/Tetris_effect

