Medo: a minimalist strategy game designed to harbor emergent complexity

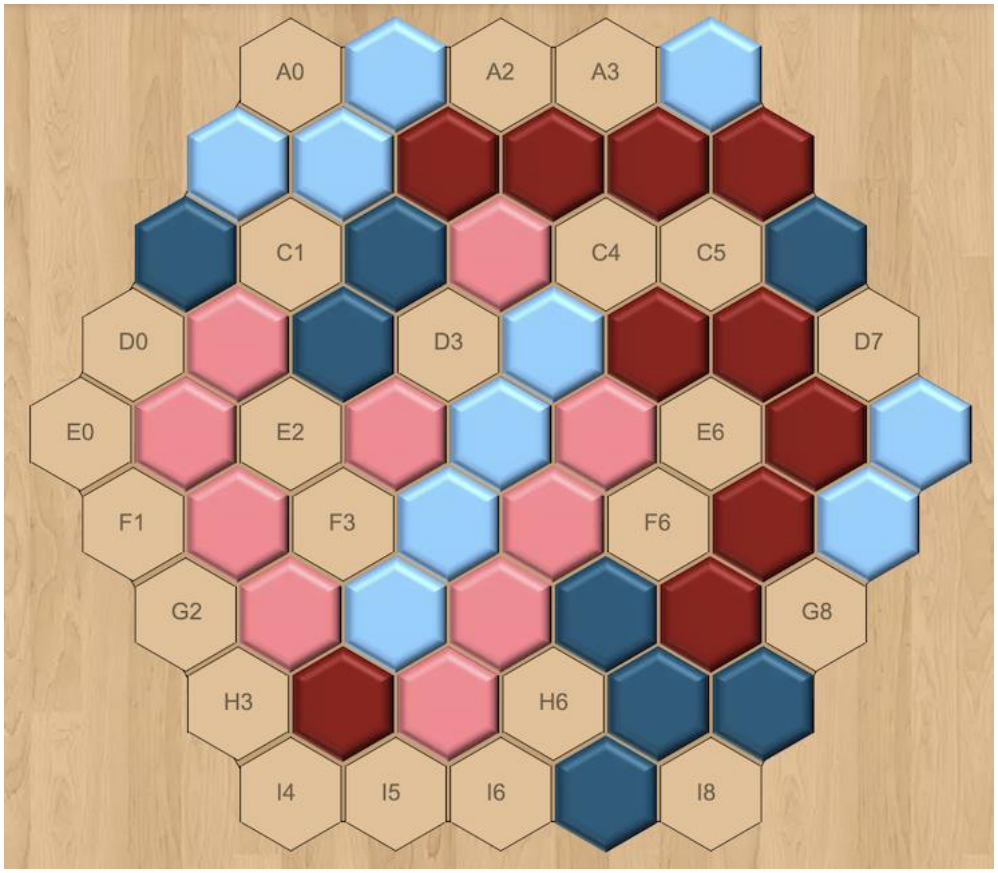
Nick Bentley Game Design, My Best Games September 13, 2020

Play Medo on Board Game Arena

I have a lifelong passion for games with minimal rules that interact to create layers of tactics and strategy you discover with time and experience.

I've been trying to design games like that for about 20 years, and slowly improving (I hope). Medo is a recent attempt. I designed it in mid-2020, have been studying it since, and concluded it's likely among my best games.

Medo is a minimalist 2-player strategy game inspired by the idea of flowers competing for space in a meadow.



Overview

One player owns dark and light blue stones, and the other player owns dark and light red stones.

The players take turns, placing stones on the initially-empty board, trying to capture groups of opponent stones. You capture opponent groups either when they're surrounded or they've grown too large. The first player to capture a certain number of stones (depending on board size) wins.

Rules of Medo

Definitions

- **Group**: a *group* is an entire set of connected stones on the board of the same color. A single stone (unconnected to others of the same color) is also a group.
- **Overgrown**: a group is *overgrown* when it has more than 5 stones in it.
- **Smothered**: a group is *smothered* when it's not touching any empty spaces.

Gameplay

- *To start, Player 1 places one stone of either of her colors on any empty space.*
- *From then on, starting with Player 2, the players take turns. On your turn, you must place 1 or 2 stones, on any empty spaces. If you place 2 stones, they must be different colors.*
- *After you place your stones, capture all smothered enemy groups, and then capture all overgrown enemy groups.*
- *The first player to have captured 20 enemy stones wins (for the board pictured in the video above).*

I recommend setting the number of stones required to win to about 1/3 the number of spaces on the board.

Here's a review of Medo that appeared in the BoardGameGeek News

Example Game

A game between the current #1 and #2 ranked players on Board Game Arena:

Beginner Strategy Tips

Here are my best tips for now. The game is young so this advice will evolve. One of my favorite things about Medo so far is how easily I've been able to discover strong, interesting heuristics for good play, and how easy they have been put into words (however, this section won't be at it's best until I add illustrations, which I don't presently have the time to do).

1. *Liberties*: an empty space next to a group is called a liberty. Because your opponent can only place 2 stones each turn, she can't smother any group with at least 3 liberties. So ensure your most important groups always have at least three liberties. More generally, be aware of how many liberties your groups, and your opponent's groups, have.

2. With each stone you place, try to raise the number of liberties around the resulting group, and/or reduce the number around one or more enemy groups.

3. It's possible to create situations where a group of yours has 3 or more liberties your opponent can't ever fill, making the group un-smotherable, a big advantage for the protected group. The methods for achieving this are complicated and poorly understood, but be on the lookout for opportunities to protect your groups in this way.

4. The board consists of concentric rings of hexagons. The second-outermost ring is important, because groups with lots of stones on that ring are hard to capture without losing a lot of stones in the process. Therefore, in the game's opening phase, place most of your stones on that ring.

5. When you make a size-5 group, it can no longer evolve, which reduces your flexibility. Don't make a size-5 group unless what you gain from it is more valuable than the lost flexibility.

6. More generally, grow your groups *slowly*. The larger a group gets, the less flexible it becomes. Each group under size-5 has the potential to become a variety of different larger shapes. Size-1 and size-2 groups have the potential to become all possible size-3, size-4, and size-5 shapes. But with each additional stone added beyond 2, the range of potential shapes the group can become narrows. As it does, it makes it easier for your opponent to strategize, and reduces your attacking options.

7. *Strong Liberties:* If your opponent has two size-5 groups of different colors that share a liberty, she can't place a stone there without overgrowing and losing one of her groups. Therefore, if that space is also a liberty for one of your groups, your opponent can't smother it without overgrowing, giving you an advantage. Such empty spaces are called *strong liberties*. Try to force your opponent to make strong liberties for you, and avoid making strong liberties for them.

8. *Overgrowth Sacrifice*: because players sometimes rely on strong liberties to keep their groups alive, those groups are susceptible to a kind of sacrifice play where a player intentionally overgrows to fill a strong liberty and smother an opponent group. The sacrificing player will lose 6 stones due to overgrowth, but the other player can lose up to 5 stones due to smothering. Ergo, the sacrificing player may sacrifice as little as one net point in the sacrifice. This can be worth it strategically. For example, if it saves a strategically important group from being smothered.

9. Building parallel lines separated by a space can be strong, because it will be hard for the opponent to fill that space without getting captured.
10. Make a group with two liberties that are both adjacent to the same size-5 enemy group. It'll be harder to capture. The opponent needs two turns to fill those liberties to avoid overgrowing. Sometimes, due to other reasons, that's the opponent's only option. This is especially powerful on smaller boards where a greater proportion of spaces are edge spaces: the tactic is most powerful near the edge.
11. There are three shapes made of three stones: the bent line is the best because it can be used to make a larger array of larger shapes than the other size-3 shapes. It gives you more flexibility.
12. If you know your opponent is better than you, try to mimic the patterns of their stone placements. A number of first-time players who've improved quickly have told me this was their approach.
13. The maximum number of liberties a group can have, and the ease of filling them, depends on its shape. For example, consider a 4-stone group shaped like a diamond. It can have 10 liberties at most. Now consider the 4-stone fidget-spinner shape below. It can have up to 12 liberties, three of which are in concavities formed by the shape. Stones in concavities are more vulnerable to attack than others. Hence the fidget-spinner shape is a stronger shape generally than the diamond, despite having the same number of stones.

Design Notes – 3 motivations for Medo

#1 – my interest in polyominoes

One motivation for Medo was my interest in Polyominoes. This will take a moment to explain:

I believe the deepest games make it easy for human perceptual machinery to model lots of important aspects of game state. To play a game, your brain has to make a model of it. The better the model, the better you can play.

But your your brain's evolutionarily-contingent computational capacities limit how well it can model different things.

For example, it's great at the hard computational problem of face recognition, because face-recognition has been evolutionarily useful.

In contrast, humans are awful at interpreting binary, because we aren't evolved for it. Imagine if Chess could only be represented in binary, and the representation we know – board and pieces – was impossible for some reason. Chess wouldn't be deep. It would be hard, but not deep. Like factoring primes. That's because brains can't model anything complicated in binary.

So: The more valuable information a game presents to you in a way your brain can process, the more deeply you can think about the game. **I think games must do this well to be deep** (it's not the only thing they must do well, but I think it's a necessary thing).

Because of that, when I design a game, I think about the alignment between a game's interface and human perception. For example: I try to ensure turn options are easy to see at a glance, so your brain doesn't have to dedicate its limited processing power to comprehending legality.

Through this sort thinking, I've concluded polyominoes are comparatively easy for your brain to model, due to a phenomenon called perceptual binding.

It occurred to me that, if I could make a territory-esque game where shapes were limited to a set of polyominoes, they could contribute to its depth.

In Medo, there are exactly 44 shapes: all the polyhexes up to pentahexes.

Because the shapes are limited, as you play, you see them repeated. In time, you understand their strengths and weaknesses. For example, see tips 9 and 13 in the Beginner Strategy section above.

To go deeper, you can study the 44 polyhexes' properties. For example:

- How many liberties does each polyomino have?
- What kinds of stone arrangements around each polyomino allows it to live? Is it easier to create life around some polyominoes than others?
- Are any pairs of polyominoes especially conducive to symbiotic life?
- What's the path diagram for constructing all the shapes, and can you use it strategize? (you can see the path diagram for the first 12 shapes in the designer notes for my game Circle of Life, here). For example, tip #11 in the tips section above was derived that way.

#2 – a desire for more life-like "life"

Another motivation for Medo was my desire to create a territory game, like Go, but without permanent "life".

"Life" in territory games seems among the least life-like things about them. In such games, a "living" group is immortal and static, but real life is always impermanent. I wanted to make a game with impermanent "life".

I discovered Medo while hunting for that game, but Medo isn't it, because life is possible in Medo. It's a complicated, symbiotic kind of life, dependent on the relationships between your own colors and between yours and your opponent's. Too complicated to discuss here.

It created interesting (to me) gameplay I hadn't seen before, so I stopped the search in favor of studying Medo.

#3 – Blooms was a promising antecedent

A third motivation for creating Medo was my game Blooms. Medo is identical to Blooms except for one rule: the rule that limits group size in Medo. I already believe Blooms to be one of my best games, and I had a hunch it could benefit from limiting group size.

I can't say whether that's true yet, because that one small rule difference makes for very different games, which are hard to compare. One observation: I'm often told Medo is more accessible than Blooms. I care about accessibility, so that's an improvement. But I don't know which is deeper. It takes a long time to understand even one game's depth. I've come believe Medo has an unusual amount of stuff that you can access under the surface, however.