NECKLACE

by Mark Steere and Luis Bolaños Mures

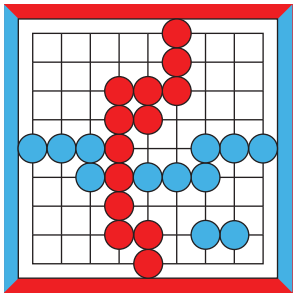

Figure 1

INTRODUCTION

Necklace is a two-player game played on a square board of any size, initially empty.

Mark Steere and Luis Bolaños Mures designed Necklace in March 2024.

OBJECT OF THE GAME

Red must form a path of red stones (interconnected via horizontal or vertical adjacencies, or both) connecting the two red sides of the board. Blue must form a path of blue stones connecting the two blue sides of the board. **In Figure 1**, Red has won.

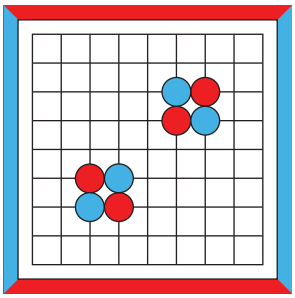

Figure 2

PLAY

The two players take turns placing their stones onto unoccupied points (subject to the placement restrictions, described below), one stone per turn, starting with Red. Passing is not allowed, but if you don't have an available placement, your turn is skipped.

CROSSCUT

A crosscut is comprised of four stones, two of each color. Each stone is orthogonally (horizontally or vertically) adjacent to its two enemy stones. **Figure 2** shows the two possible crosscut formations.

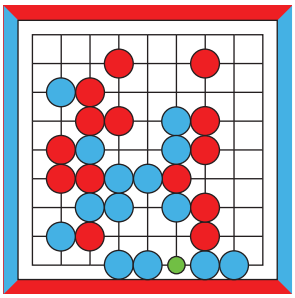

Figure 3

PLACEMENT RESTRICTIONS

* Your placement must not create a crosscut.
* After your placement, any group of unoccupied points must include an edge point. [That is, any empty region (maximal set of orthogonally adjacent, empty points) must include a point on the edge of the board.]

In **Figure 3**, the point indicated by a green dot is an illegal placement. Placing a stone there would create a group of empty points that doesn't include an edge point.

DESIGN NOTES

I (Mark) proposed the original, ill-fated version of Necklace, in which certain types of loops with alternating color stones and so forth were prohibited. That and a few revised versions ended up not making sense. Luis came to the rescue, proposing a version with a simple prohibition against ANY kind of loop, vastly simplifying the rules, and making the game functional.

Necklace has the lowest possible PDI (position disruption index). See below. Only one stone is placed per turn. No moving, swapping, flipping, capturing, or chain reactions. It may be the only known OOSCG (orthogonal only square connection game) with this distinction.

POSITION DISRUPTION INDEX* = SUM OF…

MATERIAL DIFFERENCE CHANGE

Change in the difference between numbers of opposing stones on the board effected by your turn.

SQUARE OCCUPATION CHANGE

Change to or from unoccupied: 1

Change from one color to the other: 2

POSITION DISRUPTION INDEX AVERAGE

PDI weighted average accounting for different types of turns and how frequently they're executed.

*(Steere, 2023)