Submission Summary

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The 5th International Conference on Dayalbagh (Art) Science (& Engineering) of (Evolutionary/Re-Evolutionary) Consciousness (DSC) & The 46th (Inter) National Systems Conference (NSC) 2023

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Paper Title
Maker-Breaker Triangle Game

Abstract
The Maker-Breaker triangle game, introduced by Chvátal and Erdős (1978), is a two-player mathematical combinatorial game that involves creating and restricting the formation of triangles on a complete graph. For n,q ∈ N, the (n,q)-triangle game is played by two players- Maker and Breaker, on a complete graph Kn , where n is the number of nodes and q is the number of moves for Breaker in each chance. Alternately, Maker chooses one vertex/edge and thereafter Breaker chooses q vertices/edges. The objective of the Maker is to complete a triangle consisting of his/her choices whereas the Breaker needs to stop the same. The Maker wins the game if he claims all the edges/nodes of a triangle otherwise the breaker wins. The game requires strategic thinking and mathematical skills, as players must analyze the graph and anticipate their opponent's moves in order to respond effectively.
In this paper, we present a Maker-Breaker triangle game simulator in the form of a web-based application. The simulator generates randomized game scenarios with provision for increasing the level of challenge and excitement for the players by varying q. The simulator facilitates two-person game play as well as one person game play with computer playing the Breaker and the person as the Maker. It is well-known that the choice of q results in three possible outcomes with theoretical bounds on q. Maker wins for smaller q’s, Breaker for larger q’s and a region of uncertainty in between. The experience with the simulator is envisaged to provide intuition for further improving the theoretical bounds on winning ranges of q for Maker and Breaker. It can also facilitate generalizing the game for any graph rather than complete graphs.

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Submission Files
Maker Breaker Triangle Game.doc (805 Kb, 5/10/2023, 5:57:10 PM)