

# ABSTRACT

In the course of this mini project, the classic board game "TIC TAC TOE" will be converted into an Android mobile application. The fundamental concept is to create an offline game that supports two players on a single device. Two players are needed for this game; one will play move "X" and the other move "O." A player must coordinate their respective moves in a horizontal, vertical, or diagonal direction in order to win the game. Once the player is aligned, a popup stating "PLAYER 1 (or) 2 WINS" will appear, and the game will then be over. Because it is a lightweight game, this programme can be used on most devices, including smartphones. People of all age groups will enjoy this game as it is simple, involving and a perfect way to pass time when you feel bored. The majority of games played in this game end in draws, therefore winning every time is not possible. Therefore, the best a player can aspire for is a win. The goal of this work is to compare several no-loss tactics with existing approaches while employing genetic algorithms to evolve new ones. We have created novel methods for expressing and evaluating a solution, initialising the GA population, and creating GA operators with an elite preservation scheme in order to efficiently evolve no-loss strategies. It's interesting to note that our GA implementation can identify more than 72 000 no-loss game-playing techniques. Moreover, an analysis of these solutions has given us insights about how to play the game to not lose it. Based on this experience, we have developed specialized efficient strategies having a high win-to-draw ratio. The study and its results are interesting and can be encouraging for the techniques to be applied to other board games for finding efficient strategies.