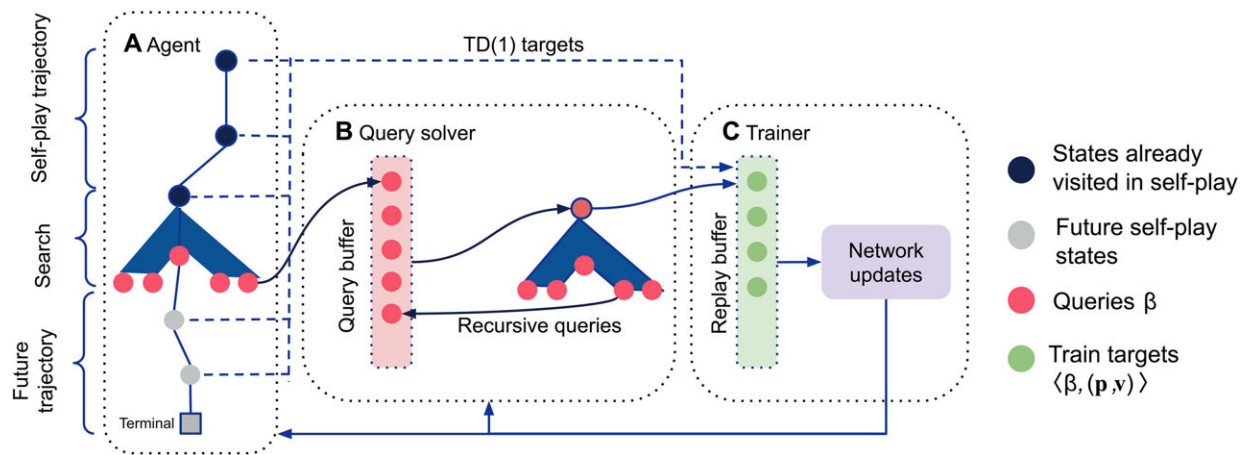


# Deep Mind's Student of Games AI system can beat humans at a variety of games

November 16 2023, by Bob Yirka



SoG training process. Actors collect data via sound self-play and trainers run separately over a distributed network. (A) Each search produces a number of CVPN queries with input  $\beta$ . (B) Queries are added to a query buffer and subsequently solved by a solver that studies the situation more closely via another invocation of GT-CFR. During solving, new recursive queries might be added back to the query buffer; separately, the network is (C) trained on minibatches sampled from the replay buffer to predict values and policy targets computed by the solver. Credit: *Science Advances* (2023). DOI: 10.1126/sciadv.adg3256

A team of AI researchers from EquiLibre Technologies, Sony AI, Amii and Midjourney, working with Google's DeepMind project, has developed an AI system called Student of Games (SoG) that is capable of both beating humans at a variety of games and learning to play new

ones. In their paper [published](#) in the journal *Science Advances*, the group describes the new system and its capabilities.

Over the past half-century, [computer scientists](#) and engineers have developed the idea of machine learning and artificial intelligence, in which human-generated data is used to train computer systems. The technology has applications in a variety of scenarios, one of which is playing board and/or parlor games.

Teaching a computer to play a [board game](#) and then improving its capabilities to the degree that it can beat humans has become a milestone of sorts, demonstrating how far artificial intelligence has developed. In this new study, the research team has taken another step toward artificial general intelligence—in which a computer can carry out tasks deemed superhuman.

To date, most computer systems built to play [board games](#) have focused on a single game—chess, for example. In building such systems, scientists have developed a certain type of limited [artificial intelligence](#). In this new endeavor, the researchers have built an intelligent system capable of playing a variety of games requiring different skill sets.

In game playing, there are two main kinds of games: those with perfect or imperfect knowledge. The former are those in which both players have perfect knowledge of the game, such as the locations of all the game pieces. The latter are those like poker, in which only some part of the information involved is known to individual players. SoG can not only play both types of games; it can beat expert humans.

Thus far, it has beat other AI systems and humans at Go, chess, Scotland Yard and Texas Hold 'em poker, and the research team suggests it could likely excel at other types of games because it is capable of teaching itself how to play virtually any game.

**More information:** Martin Schmid et al, Student of Games: A unified learning algorithm for both perfect and imperfect information games, *Science Advances* (2023). [DOI: 10.1126/sciadv.adg3256](https://doi.org/10.1126/sciadv.adg3256)

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