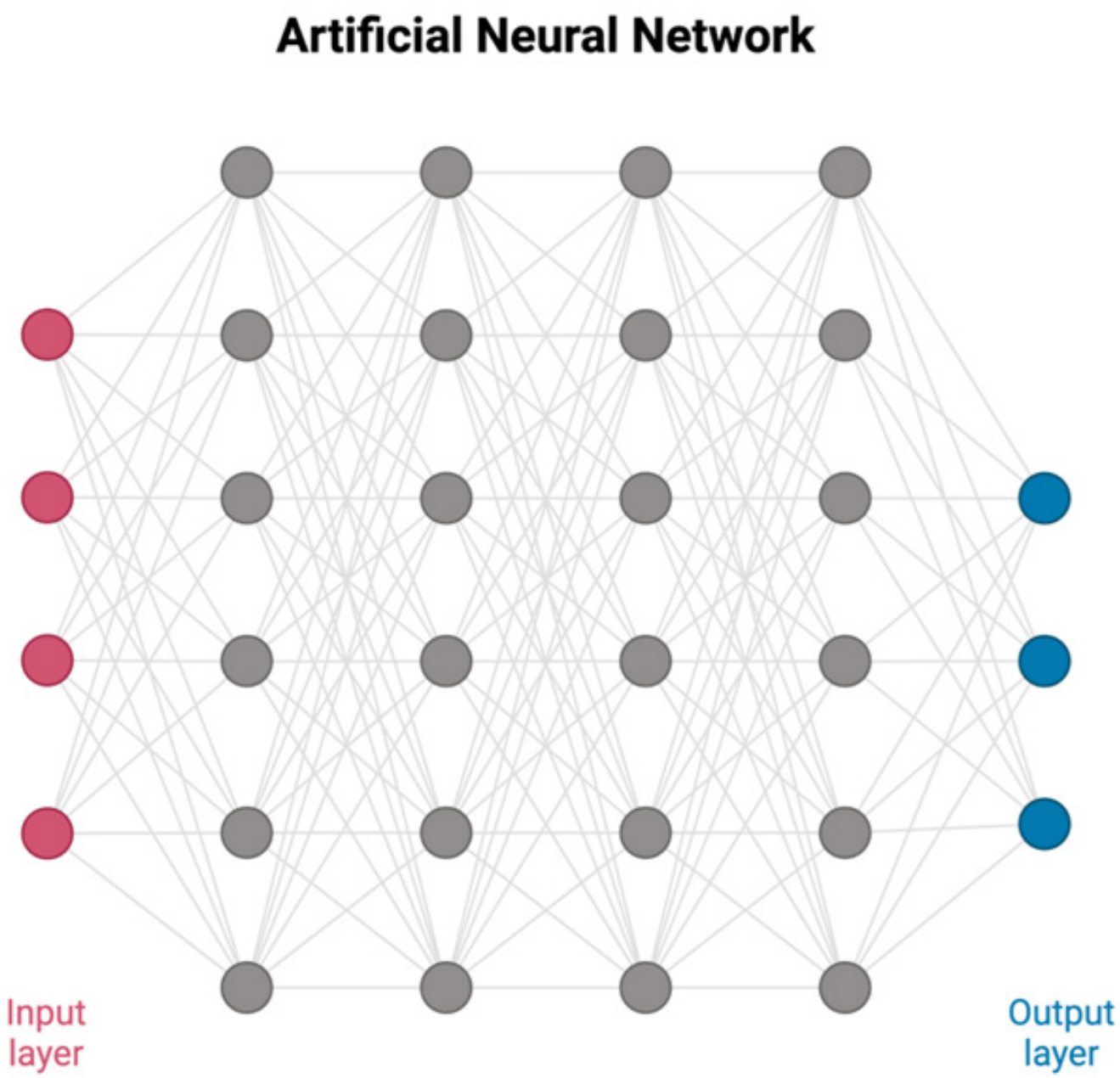
FIGURE 92



A neural network.[122]

A highly complex version of this process, called a **deep neural network**, has many such layers and is capable of highly advanced problem solving. This is the type of system that was able to beat a professional human player at the board game Go in 2015—a victory widely hailed as a triumph for machine intelligence. A similar deep neural network had already been used to beat the greatest living chess grandmaster in 1997, but Go is considered more difficult than chess. Although it is very simple and has few rules, the number of possible moves on any given turn is exceptionally vast—there are up to 10^{360} potential options, making it far more difficult to calculate or program. Only by using the latest in artificial neural network technologies were scientists able to program AI to learn the game at this advanced level.[123] Researchers are next looking to apply these complex problem-solving networks to unravel the mysteries of various medical disorders and diseases in fields like computational psychiatry.