Analysis of a winning computational billiards player

Christopher Archibald, Alon Altman, Yoav Shoham

Last modified: 2009-06-26

Abstract

We discuss CueCard, the program that won the 2008 Computer Olympiad computational pool tournament. Beside addressing intrinsic interest in a complex competitive environment with unique features, our goal is to isolate the factors that contributed to the performance so that the lessons can be transferred to other, similar domains. Specifically, we distinguish among pure engineering factors (such as using a computer cluster), domain-specific factors (such as optimized break shots), and domain-independent factors (such as state clustering). Our conclusion is that each type of factor contributed to the performance of the program.

Keywords

AI Architectures; Computer Games; Game Theory

Physics Of Billiards – Ball Collision. The physics behind billiards (or the physics behind pool), in large part, involves collisions between billiard balls. When two billiard balls collide the collision is nearly elastic. An elastic collision is one in which the kinetic energy of the system is conserved before and after impact. Relative slipping between ball and billiard table is an interesting point of analysis. It's informative to understand how the ball moves depending on where it is hit relative to \( h \). Consider the figure below. You can bet that professional players are very proficient in the practical usage of the physics presented here, as well as other aspects of the game not discussed here. Return to The Physics Of Sports page. Return to Real World Physics Problems home page. Cue sports (sometimes written cuesports), also known as billiard sports, are a wide variety of games of skill generally played with a cue stick, which is used to strike billiard balls and thereby cause them to move around a cloth-covered billiards table bounded by elastic bumpers known as cushions. Historically, the umbrella term was billiards. While that familiar name is still employed by some as a generic label for all such games, the word's usage has splintered into more exclusive competing A detailed chronology of billiards and pool follows a brief pictorial introduction to the games and how they evolved. If you're short of time and looking for something in particular, please try using CTRL-F to find it. Who was the first pool hustler? ... Who was the first American pool champion of a game that is still being played today? Albert Frey, Gottlieb Wahlstrom, Cyrille Dion, or Alfredo de Oro? Who was the greatest proposition gambler?