CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES
COLLOQUIUM

Friday, September 1
3:00 – 4:00 PM
Maria Sanford, Room 101

AN INTRODUCTION TO BOARD GAMES, COMPUTERS, AND AI

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Abstract: In the past two years, Google DeepMind used the technique of deep learning to develop AlphaGo, which has been acknowledged to be stronger than the best Go professionals due to its victories over Lee Sedol in March 2016 and Ke Jie in May 2017. Unlike the history of computer chess, AlphaGo represented a huge increase in playing skill over its predecessors, which were much inferior to professional players. Not surprisingly, this turn of affairs has taken the Go world by storm.

Because I am not a Go player and am still learning about deep learning, this talk is an introduction to what a game tree is and how it can be used to analyze a game. To make the ideas concrete, two main examples are considered. First, we study the game "gravity tic-tac-toe," which has the same rules of the usual version **except** that each move must be (1) in the bottom row **or** (2) directly on top of an existing x or o. An example game is given below where x wins. Note that this version is the three-by-three analog of Milton Bradley's Connect Four. I encourage you to challenge a friend to play and try to determine whether the first or second player has the advantage or if it is a draw. Second, we consider computer chess focusing on the endgame where game trees revealed numerous flaws in the theory developed by humans. Finally, this talk uses very little math and is aimed toward anyone who likes board games.

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