Artificial Intelligence in Chess

Data Science 2020/21 Course Description

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ABSTRACT

Chess is a game which originated thousand of years ago, and since then has kept the interest of the human mind due to its limitless complexity and challenges. Even before the computer era, humans have been trying to use artificial intelligence through different mechanisms. We have come to a point where artificial intelligence seems finally undefeatable, even by the greatest international masters. In this lecture, we are going to see how this was possible, from the first attempts of chess computer until now, and how chess programs actually function. We will analyze the human vs. computer rivalry and the difference between each one's processes. Furthermore, we will see the important role that programming languages such as R take in the modeling of chess. And how this tool helps in the creation of, what we will explain later, the so-called game trees.

Learning Objectives:

- Understand how computer chess has developed until nowadays
- Understand what is computer chess
- Understand how computer chess functions
- Understand the importance of R in computer chess
- Differentiate computer chess characteristics from human chess
- Analyze and discuss possible contributions and damages of AI in chess

Course Outline

Chapters:

1. A Brief Introduction
1.1. Review Objectives of the Lecture
1.2. Brief Review of Chess

2. History of Computer Chess
2.1. Pre-computer Age
2.1.1 The Turk
2.1.2 El Ajedrecista
2.2. Software Age
2.2.1 Early Software Age
2.2.2 Later Software Age

3. What is Computer Chess?
3.1. Definition
3.2. Main Chess Programs

4. How does Computer Chess Function?
4.1. How Humans Play
4.2. How Computers Play
4.3. Explanation Video

5. Application of Chess in R
5.1. Revision of Package

6. Discussion: A.I. in Chess, Benefits or Damages?

Literature

- Claude E. Shannon (1949) https://vision.unipv.it/IA1/ProgrammingaComputerforPlayingChess.pdf
- T.A. Marsland (1992)
  https://www.researchgate.net/publication/240458$_{C}omputer_{C}hess_{M}ethods$