Assignment 2: Dots and Boxes Write Up

Link for the YouTube video:

* <https://www.youtube.com/...>

What values for the number of plys or board size makes the game easy, challenging, too challenging? Explain how this would impact the human’s experience with the game.

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| Plys | 2x2 | 3x3 | 4x4 |
| 1-ply | Easy  AI can determine move faster, but cannot make the best decision. Human can win easily. | Hard  AI determines move fast and can beat human (1:1) | Medium  AI slower in the beginning and doesn’t always make optimal move. |
| 2-ply | Easy  AI can determine move faster, but cannot make the best decision. Human can win easily. | Medium  AI slower to make moves, but human can still win | Very slow |
| 3-ply | Medium  Human can still win, but AI takes longer to make a decision | AI much slower making a move, even with optimizations in place, |  |
| 4-ply | Medium  Human can still win, but AI takes longer to make a decision |  |  |
| 5-ply | Medium  The first move takes the longest for the AI to make. Human can still beat the AI. |  |  |

What values for the number of plys or board size makes the game run too slow? Is there a tradeoff between creating a challenging experience and the time it takes for the AI to make a move?

* For a 3x3 board, any number over 4 as the ply-limit would make the game run too slow. For boards of size 4x4 and up, a single ply is enough to be slow, and anything more than 2 ply is too slow. Yes, there is a tradeoff between creating a challenging experience and the time it takes for the AI to make a move. You can make the game be fast and easy, or slow and challenging. The deeper you go could make the AI prune/miss optimal moves because it looks beyond boxes that only have 1 edge left.

How much deeper into the tree can the AI explore using alpha-beta pruning?

* Twice as deep