Artificial Intelligence Decision Making in Game Design

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AI Comparison

Basic AI

Complex

Decision Tree

A decision tree can be implemented as if-then-else statements or as a tree data structure.

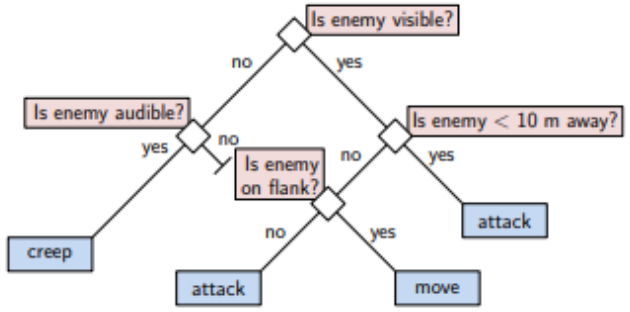


Fig. 1: A decision-tree for a combatant agent.

Mount & Eastman, cs.umd.edu, 2018

Finite State Machine

A finite state machine can be implemented using a two-dimensional array.

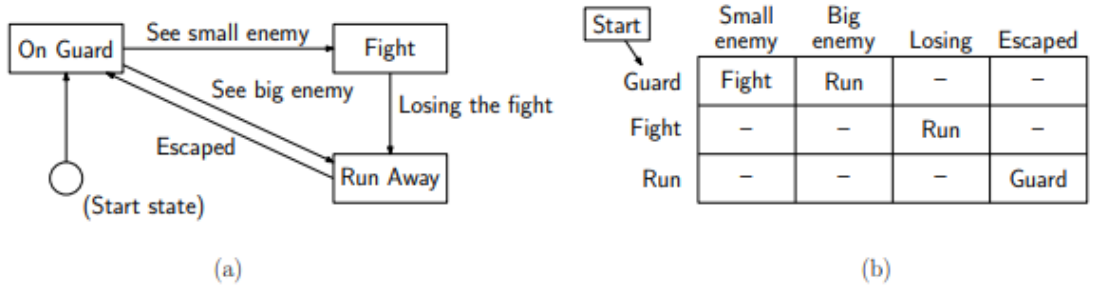


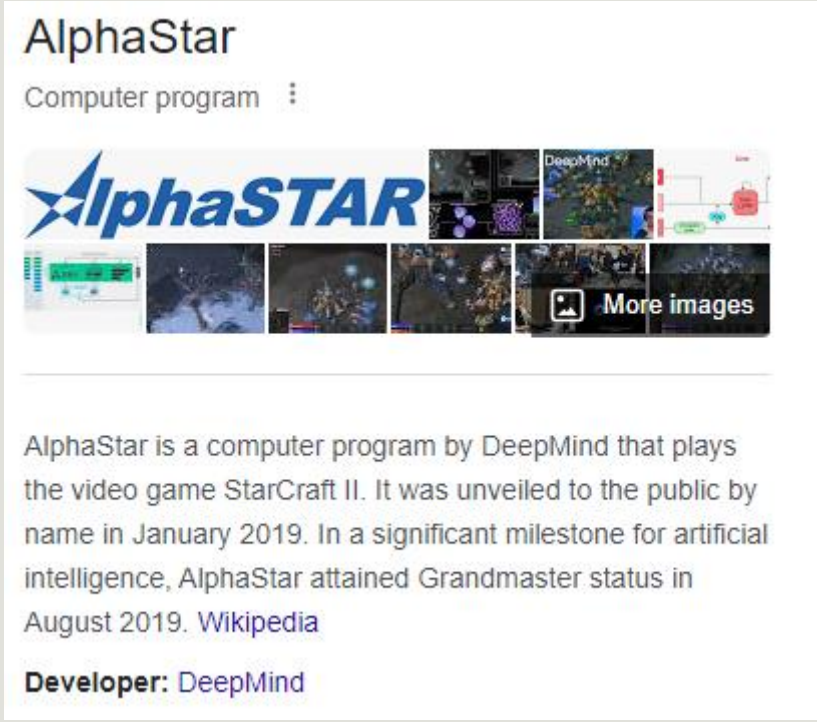
Fig. 3: A simple state machine for a warrior bot.

Mount & Eastman, cs.umd.edu, 2018

Why not implement the most advanced AI?

- Statt reported that "The Google-owned AI lab's more sophisticated software, still called AlphaStar, is now grandmaster level in the real-time strategy game, capable of besting 99.8 percent of all human players in competition."

- Many users would have a negative experience playing against such a difficult opponent.



Conclusion

References

Mount, Dave, and Roger Eastman. “CMSC 425: Lecture 21 Artificial Intelligence for Games: Decision Making.” *University of Maryland*, 13 Jan. 2018, www.cs.umd.edu/class/spring2018/cmsc425/Lects/lect21-ai-dec-making.pdf.

Statt, Nick. “DeepMind’s StarCraft 2 AI Is Now Better than 99.8 Percent of All Human Players.” *The Verge*, The Verge, 30 Oct. 2019, www.theverge.com/2019/10/30/20939147/deepmind-google-alphastar-starcraft-2-research-grandmaster-level.

“The Division - Story Mission: Napalm Production Site.” *Youtube*, IGN Guides, 28 Mar. 2016, www.youtube.com/watch?v=YYGH72rcX6M&ab_channel=IGNGuides. Accessed 17 Oct. 2023.

“The Power of Artificial Intelligence in Game Development.” *Datacenters.com*, www.datacenters.com/news/the-power-of-artificial-intelligence-in-game-development#:~:text=Generating%20Diverse%20Game%20Scenarios. Accessed 17 Oct. 2023.