

chizuru4rogue: Deep Reinforcement Learning for Deep Dungeon Crawling

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Abstract

chizuru4rogue is a computer program designed to play the revered video game Rogue. It is designed to use all the information at its disposal to determine the next best move in order to push further and win the game.

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Declaration

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1 Introduction

2 Rogue

3 Research

4 Design

A player interacts with Rogue through the keyboard alone. The game is turn-based, so the agent interacts with the game every time they may perform an action on their turn. When it is the agent's turn, the agent receives an encapsulation of the data a human can observe, henceforth known as the "observation state". The agent then returns a keystroke that they wish to use as their action, as every action in Rogue is performed with a keystroke.

As the game is terminal based, parsing each pixel is unnecessary, what we do instead is take each cell and what letter they currently are as input.

4.1 Policy Optimisation

Our goal was to find an optimal policy that maximises the chance that the agent can successfully reach the 26th dungeon level and get the Amulet of Yendor.

5 Development and code

6 Agent Training and Observations

7 Reflection

8 Conclusion

References