
Multimodal Artificial Intelligence for Doudizhu

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Abstract

1 Doudizhu is a typical poke game with imperfect information. My project aims
2 to build a multimodal artificial intelligence for Doudizhu. The AI will not only
3 take the game state and history action as input, but also the emotional and facial
4 expression of the players by a vision recognition module and a speech recognition
5 module, which also handle the transform of game state (if possible).

6 Introduction

7 Doudizhu represents a complex decision-making environment involving hidden information, bluffing,
8 and emotional interaction among players. Traditional AI approaches for such games focus solely on
9 card state and history, ignoring the social and psychological aspects that influence player behavior.
10 This project explores a multimodal AI that perceives not only the gameplay state but also player
11 expressions and speech.

12 1 Research Goals

13 The main research goal is to design an AI system capable of integrating multimodal sensory data to
14 enhance strategic reasoning in imperfect-information games.

15 2 Methodology

- 16 • Collecting previous Doudizhu game data, including labeled datasets for card recognition,
17 and base datasets of videos and audios of Doudizhu games.
- 18 • Collecting existed models and frameworks of Doudizhu AI, emotion recognition, facial
19 expression recognition, and speech recognition.
- 20 • Implementing a baseline Doudizhu AI using reinforcement learning or supervised learn-
21 ing.(Currently I can only find RL frameworks)
- 22 • Train the prototype model with the collected datasets.

23 3 Expected Contributions and Outcomes

24 Deliver a working prototype demonstrating the feasibility of emotion-aware Doudizhu AI.

25 4 Conclusion

26 This project seeks to combine game-theoretic reasoning with multimodal learning to build an intelli-
27 gent Doudizhu agent that interacts and reasons in a more human-like manner. The research outcomes
28 may inspire further exploration of emotion-integrated AI in complex social games.