



Text Based Adventure Game

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Abstract: The Text Based Adventure Game project aims to modernize the classic text-adventure genre by integrating AI-powered storytelling, speech recognition, face and eye detection, and multilingual support. Unlike traditional systems where players type commands, this system allows natural voice input to navigate the story. The game intelligently narrates scenes, responds dynamically to player actions, and adapts its difficulty level based on the player's facial expressions. This document outlines the system's design, including its use of the Gemini API for narration and MediaPipe for eye-tracking controls.

Keywords: Artificial Intelligence, Text-Based Games, Speech Recognition, Emotion Detection, Gemini API, Human-Computer Interaction.

I. INTRODUCTION

The traditional text-based adventure game systems are among the earliest forms of interactive entertainment, dating back to the late 1970s with titles such as Colossal Cave Adventure and Zork. These games rely entirely on text as both the input and output medium, requiring players to interact by typing specific commands like 'go north' or 'take sword'. Although historically significant, such systems are static, operating on rule-based parsers that do not understand natural language or adapt to the user.

The proposed system modernizes this genre by integrating Artificial Intelligence (AI), Voice Commands, Facial Expression Detection, and Eye Tracking technologies. The main objective is to design a console-based adventure game that interacts with the player through text commands and narrative responses while implementing branching storylines. The system includes six thematic levels—Castle, Volcano, Desert, Forest, Cave, and River—each with unique music and sound effects.

II. LITERATURE SURVEY

Existing research highlights the evolution of AI in gaming.

- **AI Benchmarks:** Ammanabrolu et al. (2021) provided a review of AI for text-based games, identifying challenges such as state tracking, commonsense reasoning, and natural language generation.
- **Reinforcement Learning:** Zahavy et al. (2022) discussed reinforcement learning issues like sparse rewards and partial observability.
- **AI Agents:** Lin and Chen (2022) explored the transition from symbolic AI to deep reinforcement learning.
- **Procedural Content:** Côté et al. (2020) surveyed procedural content generation methods for text-based games.

III. METHODOLOGY

The system is developed as a web-based application using HTML5, CSS3, and JavaScript. It integrates several APIs:

- **AI Narration:** Gemini API generates dynamic narration.
- **Expression Detection:** Face-API.js recognizes user expressions to adjust difficulty.
- **Eye Tracking:** MediaPipe Face Mesh enables hands-free interaction.
- **Voice Interaction:** Web Speech API allows voice commands.
- **Data Storage:** LocalStorage saves player progress without external databases.

IV. RESULTS AND DISCUSSION

The project was tested on Windows 10 and 11 using Chrome and Edge.

- **User Interface:** The login screen includes a fantasy-themed background. The Level Selection interface lets users choose environments and difficulty levels.
- **Game Mechanics:** In the Forest level, the AI narrated scenes and responded to choices.



- Performance: The system handled camera tracking, microphone input, and AI processing without lag.
- Accuracy: Expression detection adjusted difficulty within 2 seconds.

V. CONCLUSION

The Text Based Adventure Game shows how traditional games can be enhanced using AI and computer vision. Voice control and eye tracking improve accessibility while creating a personalized experience. The modular design supports expansion with new storylines and characters.

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