

APAN 5560 Generative AI

Group X Project Proposal

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## Project Proposal: RPGChat.AI - Role Play Conversational AI App

### Executive Summary

RPGChat.AI provides users with a unique creative space to design and interact with AI-driven characters of their own imagination. Whether inspired by fantasy heroes or everyday companions, users can easily create personalized characters and engage in meaningful, dynamic conversations.

Unlike traditional scripted chatbots, our system delivers real-time, human-like responses by understanding conversational context and adapting to diverse dialogue styles. This enables natural, immersive, and emotionally engaging interactions.

RPGChat.AI caters to a wide range of user needs—relaxation, inspiration, or role-playing—offering a platform where creativity meets intelligence. Through this innovative conversational experience, users can explore endless narrative possibilities and enjoy truly personalized communication.

### Project Objective

The objective of this project is to develop a role-play conversational AI application that enables users to interact naturally with AI-generated characters through dynamic and context-aware dialogue.

The system will feature a lightweight web interface connected to a custom backend designed for model integration, fine-tuning, and contextual memory management. The backend will serve as the core component, supporting character persona modeling, conversation history tracking, and real-time text generation through many popular large language model APIs.

The final outcome will be a functional demo that demonstrates how fine-tuned AI agents can create immersive, personalized role-playing experiences.

### User workflow

Users begin by registering or logging into the platform to create personalized AI avatars. Each avatar can be customized through an interactive workflow, where users can define the avatar's name, appearance, personality traits, emotional tone, and relationship to the user. The system allows customization of dialogue style, background story, and scenario settings such as time, location, or events.

User can upload or generate (by prompt with AI) character images, configure dialogue prompts, and assign settings like scenario, environment, or narrative opening. Once the avatar is published online or confirmed in local, users can initiate real-time conversations—either with their own avatars or those shared by others in community.

The backend model integrates the avatar's persona data, scenario context, and conversation history to generate dynamic, context-aware responses that evolve naturally with each interaction.

## Design of Tech Stack

### Frontend

The frontend, developed with React, Vue, or Flask-HTML, provides an intuitive interface for character selection, chat visualization, and optional avatar creation. It supports dynamic rendering of dialogue bubbles and persona cards as avatars, enabling seamless communication between users and AI characters.

### Backend and API

The backend will be built with Flask or FastAPI to handle model integration, dialogue management, and data exchange. It connects to multiple large language model APIs—such as OpenAI, DeepSeek, Grok, Hugging Face, or locally deployed LLaMA-3—and supports model fine-tuning through LoRA or instruction-tuning on curated role-play datasets like Persona-Chat and Roleplay-IO.

The backend maintains persona memory, chat history, and contextual knowledge through a retrieval-augmented generation (RAG) module, while providing RESTful endpoints (/generate, /character, /history) for real-time interaction between the frontend and the AI engine.

## Literature Review for Dataset Referenced

To build an immersive role-play conversational AI, pre-training data must include structured persona and dialogue annotations—linking each utterance to defined characters, settings, and emotions. Datasets with multi-turn, context-rich conversations and grounded world references enable the model to sustain coherent character identity, narrative flow, and environmental awareness. Such features form the foundation for training AI agents capable of natural, story-driven interaction in fantasy or tavern-style settings.

The Persona-Chat Dataset (Korshuk, 2023) remains a cornerstone resource for character-based conversational modeling. Each dialogue embeds predefined persona descriptions—such as a speaker's background, interests, and temperament—enabling models to sustain consistent voice and tone across multi-turn exchanges. Building on this, the Synthetic Persona-Chat Dataset (Google Research, 2024) scales the paradigm through automated persona–dialogue generation, expanding coverage across demographic and stylistic dimensions. Its large volume supports general persona reasoning prior to

fine-tuning for domain-specific role-play. At a more instruction-structured level, the Roleplay-IO Dataset (*Korshuk, 2023*) transforms persona prompts into “You are …”-style scenes with matching responses, making it useful for instruction-tuned fine-tuning and behaviorally consistent character design. Extending beyond dyadic interactions, the Multi-Character Dialogue Dataset (*AgentLans Group, 2024*) supports multi-speaker conversations across fantasy, science-fiction, and historical settings, which is particularly suitable for modeling group interactions or tavern-style dialogues.

Finally, the LIGHT Dialogue Dataset (*Shuster et al., 2021; Facebook AI Research*) represents a major step toward grounded and continuous learning in conversational AI. Situated within an interactive medieval-fantasy world, it captures human–bot dialogues enriched with location, object, and persona context. Unlike static datasets, LIGHT emphasizes “learning in the wild,” where models iteratively retrain on data from human interactions.

## Dataset Reference

- 1. Korshuk, A.** (2023). *Persona-Chat Dataset* [Data set]. Hugging Face.  
<https://huggingface.co/datasets/AlekseyKorshuk/persona-chat>

A foundational dataset for persona-grounded dialogue, defining speakers through background and personality descriptions. Widely used to train models on maintaining consistent tone and identity across multi-turn conversations.

- 2. Google Research.** (2024). *Synthetic Persona-Chat Dataset* [Data set]. Hugging Face.  
<https://huggingface.co/datasets/google/Synthetic-Persona-Chat>

An expanded, synthetic corpus derived from Persona-Chat that introduces large-scale, automatically generated persona-dialogue pairs. Enables general persona reasoning for subsequent fine-tuning in specialized domains.

- 3. Nguyen Minh, H.** (2023). *Roleplay Dataset* [Data set]. Hugging Face.  
<https://huggingface.co/datasets/hieunguyenminh/roleplay>

Focuses on fictional personas with rich narrative and linguistic variation. Ideal for fine-tuning dialogue agents to exhibit stylistic character traits in fantasy or storytelling contexts.

- 4. Silk Road Team.** (2024). *ChatHaruhi-54K Role-Playing Dialogue Dataset* [Data set]. Hugging Face.  
<https://huggingface.co/datasets/silk-road/ChatHaruhi-54K-Role-Playing-DIALOGUE>

Contains 54,000 expressive, multi-turn dialogues inspired by anime and fantasy settings. Enhances narrative fluency, emotional tone, and theatrical dialogue generation in creative role-play models.

**5. Korshuk, A.** (2023). *Roleplay-IO Dataset* [Data set]. Hugging Face.

<https://huggingface.co/datasets/AlekseyKorshuk/roleplay-io>

Features “You are...” style scene prompts with character responses, designed for instruction-tuning. Useful for converting persona definitions into structured training pairs for behaviorally controlled AI characters.

**6. AgentLans Group.** (2024). *Multi-Character Dialogue Dataset* [Data set]. Hugging Face.

<https://huggingface.co/datasets/agentlans/multi-character-dialogue>

Provides multi-speaker fantasy, sci-fi, and historical dialogues. Valuable for developing group interaction capabilities and coordinating dialogue among multiple AI-driven personas.

**7. Microsoft Research.** (2021). *CRD3 – Critical Role Dungeons & Dragons Dataset* [Data set]. Hugging Face. <https://huggingface.co/datasets/microsoft/crd3>

Derived from live Dungeons & Dragons transcripts, featuring long-form improvised conversations. Ideal for modeling spontaneous, story-driven dialogue and narrative continuity in fantasy settings.

**8. LIGHT Project Team.** (2021). Shuster, K., Urbanek, J., Dinan, E., Szlam, A., & Weston, J. (2021). *Dialogue in the Wild: Learning from a Deployed Role-Playing Game with Humans and Bots (LIGHT Dialogue Dataset)* [Data set]. ACL Anthology. <https://aclanthology.org/2021.findings-acl.54.pdf>

The LIGHT dataset (Learning in Interactive Grounded Human-robot Tasks) was developed by Facebook AI Research to study grounded, role-playing dialogue in an open-domain medieval fantasy world. Within this interactive environment, human players assume character roles, perform actions, and engage in multi-turn conversations referencing locations, objects, and social dynamics. The corpus captures over 8.5K episodes and 111K utterances, integrating textual world descriptions with dialogue grounded in situational context.