AI revolution in
GAMES Industry

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COMM408 Final Project

- Two quick game demos
- AI NPCs, Endless Branching Storyline, 'Real' Open-Word Game......

GAME OVER

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01.
Class Nexus

Bridging Week 6 Class Contents with My Final
Project: Key Points for Review

Why this
The Breadth of AI
is an important issue?

Policy Challenges

Policymakers struggle to keep up with the pace of the broad application of AI, ensuring that AI is used responsibly and safely across various domains.

Public Trust

As AI becomes more prevalent, public understanding and trust in AI technologies are crucial. Misconceptions or lack of understanding can lead to resistance or misuse of AI

Innovation Problem Solving

When applying AI, people may find complex challenges that traditional methods struggle to overcome could be addressed, pushing the boundaries of what is technologically possible and opening new avenues for exploration

what members of the public should know about it?

Limit of AI

Artificial intelligence is not infallible. It can be wrong, especially if it is biased by limited data set. Many AI products in different areas now require human assistance.

Ethical Considerations

AI raises ethical questions, such as data privacy, surveillance, and biases in decision-making algorithms.

Impact on Daily Life

AI affects many aspects of daily life: from personalized recommendations on streaming services to digital assistants in smartphones. In the future, we will embrace more AI products in different areas.

02.
Analysis

The current Game Industry with AI

7,105.4 Mn

"The Generative AI In Gaming Market size is expected to be worth around USD 7,105.4 Mn by 2032 from USD 922.0 Mn in 2022, growing at a CAGR of 23.3% during the forecast period from 2023 to 2032."

Driving Factors of Generative AI

Enhanced Gameplay

Generative AI allows dynamic and individualized gameplay experiences that adapt to the preferences and talents of the players, increasing engagement.

Content Generation

AI may be used by game creators to generate massive amounts of material, such as maps and characters, as well as missions and stories, saving development time and expenses.

Realistic Graphics

AI-powered graphics engines create stunning, lifelike visuals, immersing players in virtual worlds like never before.

Procedural Generation

Procedural content generation algorithms create endless game worlds, ensuring unique experiences for players with each playthrough.

Four types of AI Applications

Game Implement

Integrate AI technologies into various systems design and coding processes to enhance functionality and efficiency.
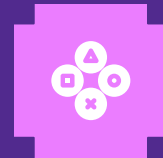
Gamer Analysis

The use of AI to study and understand player behaviors and preferences, which helps gamers to improve their skills.

Game Interactivity

Create dynamic, responsive, and immersive game experiences within video games, such as AI NPCs, endless storylines and so on.

Game Element Design

Innovate and improve the design of game elements such as levels, characters, and challenges, environment……

03.
AI in Games

Current Attempts of AI Application in the Game Industry

Attempt#1: Stanford Computational Agents

Stanford developed a game similar to Sims, featuring non-player characters (NPCs) driven by ChatGPT AI technology. These NPCs displayed autonomous behavior daily, engaging in complex interactions and conversations, and even organized a party independently.
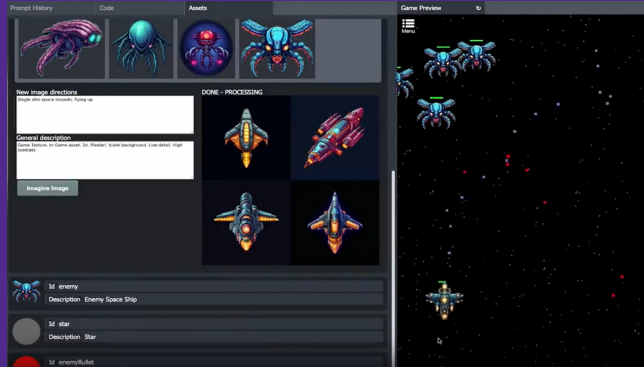
Attempt#2: ClickUP Generate Game Developments with AI.

The capabilities of ChatGPT and SD have been integrated to allow for game coding in natural language within a single interface, along with the generation of game materials, which are then combined into a complete game.

Attempt#3: Layer.AI
Create professional game art, without limits.

Layer.AI is a tool for developers to generate game the art with mature custom brand styles. Each generation of production-ready assets usually takes only less than one minute and a few clicks.
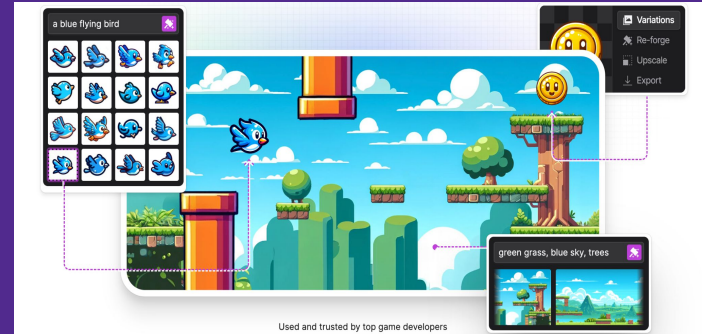
04.

My Game Demos

MY attempts to utilize AI for game creation

PRESS START

Attempt#1: Pac-Man conducted by ChatGPT

Click to see the demo here

Here is the list of prompts I give to ChatGPT:

1. Help me write a Pan-Man game in python
2. The code doesn't work, could you write in a more simple way?
3. There are some bugs in the program you gave to me. Here is the error message:"……"
4. Let me specify the rules of Pac-Man games and give you some possible actions from Users.
5. There is no exit button in this game could you add one for it?
6. If you could not find a way to let users exit with a button, is there any other way could stop this game? ……

Based on my previous analysis, I identified four distinct AI applications within the gaming industry. Inspired by these, I'm embarking on a series of similar attempts. For my initial attempt, I plan to utilize ChatGPT exclusively for coding and constructing a game from scratch.

> **You**
> Help me write a Pan-Man game in python
>
> **ChatGPT**
> Creating a simple "Pan-Man" game in Python, presumably inspired by the classic Pac-Man, can be a fun and educational project. I'll guide you through the steps to create a basic version of this game. We'll use the `pygame` library, which is great for creating 2D games. Make sure you have Python and `pygame` installed on your computer.

The codes created by ChatGPT and the instructions on how to play it are located in the "demo1" folder.

Demo1 ANALYSIS

STRENGTHS

The game developed using ChatGPT could be shared. Additionally, it significantly reduces the time required to complete a basic game. For me, finishing this simple demo takes less than an hour.
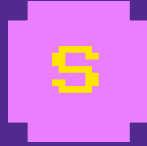
WEAKNESSES

Using ChatGPT to implement a game needs human assistance, demanding that individuals possess fundamental computer science skills to offer feedback to the AI, aiding in its enhancement.

OPPORTUNITIES

ChatGPT's accuracy and autonomy are currently insufficient, Additionally, the current AI could not handle complex and interactive game logistics. But there's potential for improvement in the future.
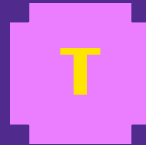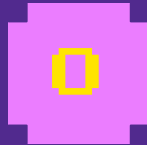
THREATS

ChatGPT might incorporate code from other programmers into its outputs, which could potentially lead to issues regarding code references.

Attempt#2:
Text mystery Game conducted by ChatGPT

<u>Click to see the demo here</u>

In the second demo, I want to explore the possibility of the interaction between payers and AI. Traditional games limit players to a set of fixed questions with NPCs, but the AI approach allows for open-ended inquiries, broadening the range of interaction. This AI-driven design not only improves the gaming experience but also dynamically adapts to player inputs, guiding them to crucial discoveries in the game.

In this demonstration, I utilize the " Create a GPT" feature of ChatGPT to develop a basic mystery game that relies on text interactions. The player, acting as a detective, can ask any questions to characters like a police officer, a medical examiner, the victim's family, and three suspects, aiming to identify the murderer from the suspects.

My GPTs

+   **Create a GPT** Beta
     Customize a version of ChatGPT for a specific purpose

Mystery Ensemble ·
Interactive mystery game character, adept in multiple roles for an engaging detective game. 🔒

Prompt:"The GPT is designed as an interactive character for a mystery game demo. It plays multiple roles……" see complete prompts in folder "demo2"

Demo2 ANALYSIS

STRENGTHS

AI can respond to any question of your interest, and with NPCs currently powered by AI, there are no preset questions, allowing you as a player to explore more freely.

S **W**

WEAKNESSES

Maintaining an NPC incurs relatively higher costs and storage requirements. For instance, using ChatGPT to generate an NPC in my demo is somewhat slower compared to other tasks. Moreover, in the Stanford game scenario, simulating just two NPCs for two days required thousands of dollars in computing and memory resources.

OPPORTUNITIES

The cost of using AI could be lowered in the future. The current price for using ChatGPT $0.01 / 1K tokens for input and $0.03 / 1K tokens for output.

O **T**

THREATS

The manipulations of human inputs may lead to malicious content and then crush the whole game.

05.

Prospects
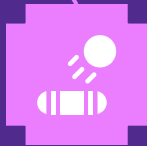
The Future of AI in the Gaming Industry

AI's STRATEGY

GOAL

Accessibility

Functionality

Lower price for using and manipulating AI

Be more intelligent, could output correctly without human assistance

swiftly and effectively respond to players' input, with the ability to handle multiple users simultaneously

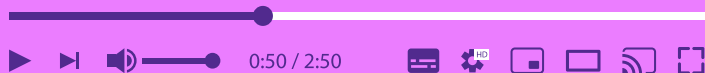identify malicious content and prevent its dissemination

AI's Future

Possible Scenario #1

With AI in the future, we could create realistic and intelligent NPCS; generate dynamic environments and endless storylines, also enhance players' experiences in a personalized way.
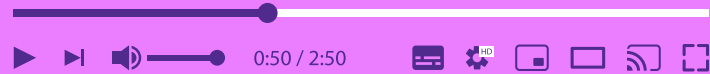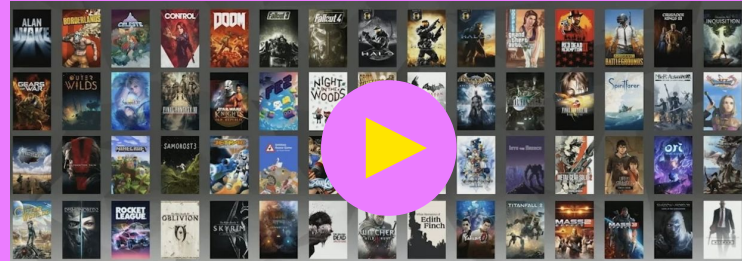
0:50 / 2:50
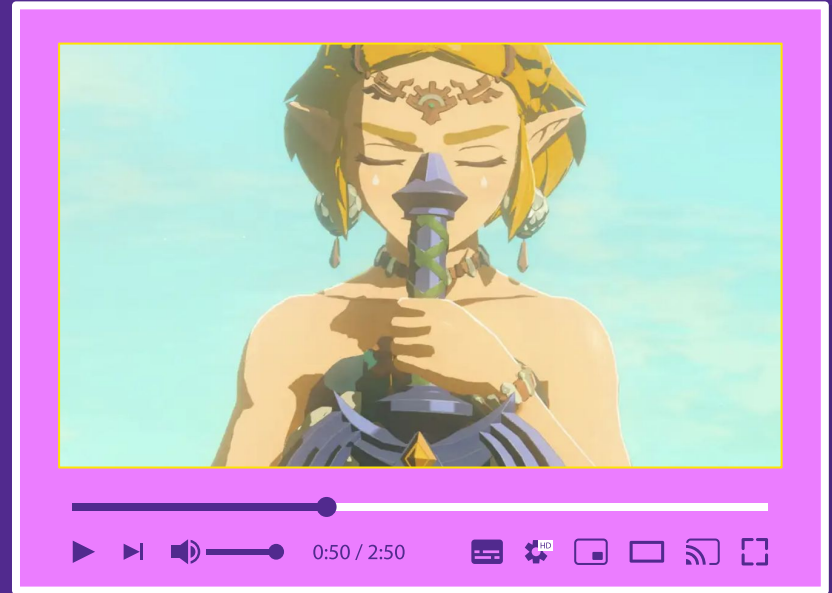
AI's Future

Possible Scenario #2

With low prices and high accessibility of AI, people with no prior knowledge of computer science could design and develop their own games. There will be no technical barrier.

More Scenarios

......

People would have better games and everyone could be a game designer in the future

0:50 / 2:50

06.
References

Try your first AI-Game demos with the following prompts!

RESOURCES

https://www.layer.ai/
https://hai.stanford.edu/news/computational-agents-exhibit-believable-humanlike-behavior
https://www.linkedin.com/pulse/generative-ai-gaming-market-growth-analysis-forecast-lipdf/
https://clickup.com/features/ai?utm_source=google&utm_medium=cpc&utm_campaign=gs_cpc_amusa_nnc_brand_trial_all-devices_troas_lp_x_all-departments_x_brand&utm_content=all-countries_kw-target_text_all-industries_all-features_all-use-cases_clickup_features_ai_exact&utm_term=e_clickup%20ai&utm_creative=655791416566_BrandChampion-03072023_rsa&utm_custom1=&utm_custom2=&gad_source=1&gclid=CjwKCAiAjrarBhAWEiwA2qWdCMeEcOlh4bncr6aWy0iMVXTBYrz9nfonoK_cySwkHN2b8lWHW2ftEhoCvF4QAvD_BwE

THANKS!

Also thanks for the following AI partners: