# Week 6: Generative AI

By: Timothy Merino, Dolphin Nie, Dylan Imperato

# Generative AI

- AI is used to build game assets and levels
  - Bing generated image: linus torvalds and Guido van Rossum play super smash bros together
- Can be done conceptually, at design time, and at runtime
- Our project features at runtime generative AI in two forms
  - 5$ model
  - ChatGPT

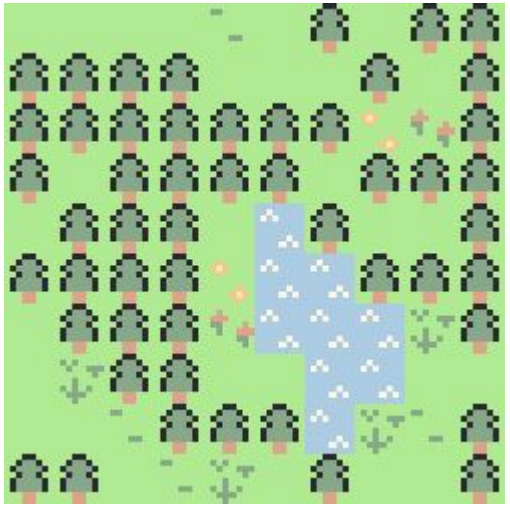
# 5$ Harvest

- Your alien boss demands resources
- Enter a description that is going to contain the most of the goal tiles
- Move to collect them

# 5$ model

- Simple text-to-map model
- Generates tile-based maps using predefined Tile palette 

pond in a forest with flowers



- Running on server, game passes user input and gets map in return
- Processing:
  - Maps are cropped from 10x10 to 10x7 to fit in game

# ChatGPT

- We use GPT4-V to generate to create levels
- 50 levels generated, GPT acts like a Alien instructing you to collect materials
- Each level has a vague description of what the NPC wants you to collect, and 3 tiles associated with it
  - Player needs to write a prompt and generate a map with the desired tiles to collect
- Example:

> 2. Description: "My spaceship needs a stable landing. What can I use?"
>
> Tiles: [cobblestone, rock, sand]

- Challenge: Don't want to give the player too much info so they just copy and paste the prompt

# ChatGPT

## Prompt used:

Act as an NPC for my game. The game is based around using a text-to-game-map model, which generates 2D tile maps using the attached tile sprite sheet: 

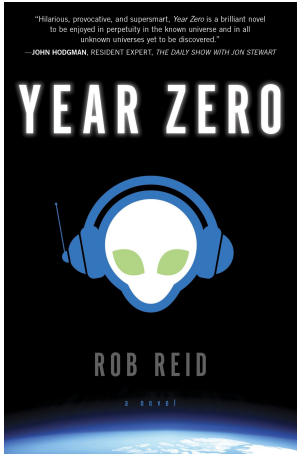
The game puts the player onto the generated game map, where they can move only upwards and to the right, until they eventually reach the top right which is the end of the level. The challenge is for them to collect as many of certain tile types as possible. The two ways they do this are:
1. Inputting a text prompt that will result in maps that contain the target tile tiles
2. Moving intelligently through the map to maximize collection of these tiles

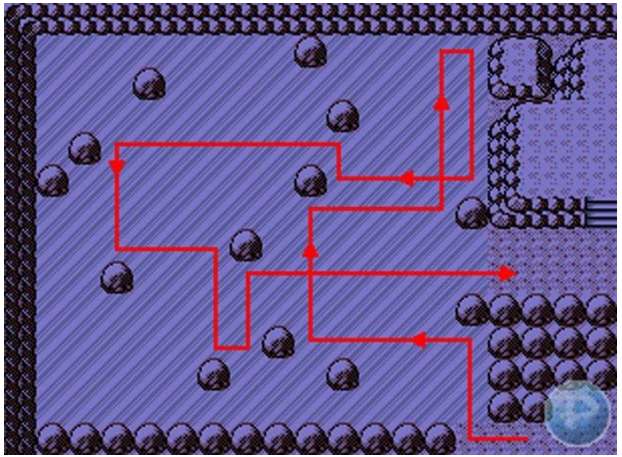
I need to create levels for these players, with different sets of tiles that they are supposed to collect. Generate 50 sets of level data. Each level will have: A set of 3 tile names, and a request.
The tile names correspond to the 16 tiles in the image. From top left to bottom right, the tiles are:
[grass, dark grass, yellow flower, red flower, weeds, cobblestone, sand, rock, mailbox, fence, tree, water, roof, door, window, pokeball]

The request needs to be vague enough that the player can't just copy it to use as their map prompt. The NPC is a hungry alien.
Here are two example of a good combination of vague description and corresponding tiles to collect:
Description: "I love the local flora here! Get me something beautiful"
Tiles: [yellow flower, red flower, tree]
Description: "We need some structures. Collect me things to build with"
Tiles: [roof, door, window]

# Game Inspirations

- Limited movement: Player can only move up and to the right
- Inspired by old pokemon ice puzzles
- Alien invasion inspired by Year Zero by Rob Reid



# Design Choices

- We chose text generation (via GPT) and level generation (via $5 model)
- 2 modality game adds extra variation, can create lots of levels without manual effort
- Wanted to make interaction with the AI the main challenge of the game, so players can feel rewarded for good prompting
- We use very simple game mechanics so most of the challenge comes from the interacting with PCG

# Game Link!

Gaming