Design Overview

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Summary of Program

Road Rash is the game that was a part of my childhood. The game based around a reckless motorcyclist who races against other around the city and can do anything, similar to open-world gameplay. The character is chased around by police if ever commits a “crime”. Meaning by running over citizens or kick, punch, push other racers. The character then can choose to fight back the police by mentioned actions.
However, the game never focuses on the citizen AI since they will just keep on getting run over by the user without fighting back. I want to further implement a citizen AI where it can choose to throw rock to the user upon running by, by predicting user’s location at X time.

Required Data Types

Table 1: <<user account>> details

Field Name	Type	Note
main_user	string	Main racer
racer	string	Other AI racers
police	string	Police detects crime by judging main user if ever commits any ‘action’ to other AI’s
citizen	string	Throw rock at racers

Table 2: <<gameplay>> details

Value	Type	Notes
health	string	HP = 100
object	string	Rock
action	string	Kick, punch, push
drive	string	Speed 0 – 150 km/h

Overview of Program Structure

Functions:

def kick/ punch/ push

- Once this function is running, it would let user to choose how to acts towards another AI's.
- Moreover, upon getting hit by the user and the HP goes down, another AI will fight back.

def drive

- Once this function is running, it would let user choose a speed from 0 to 150 km/h, depends on how many times user hits the designated 'speed up' or 'slow down' button.

def throw_rock

- Once this function is running, it would make the citizen to predict where the racer's to be at X time and throw rock to them, dealing a small amount of HP.

def police_patrol

- Once this function is running, police will patrol around the city. Police will run around the racers, doing nothing until there's a 'crime'.

def police_chase

- Once this function is running, police will chase the user to fight upon detecting any HP loss done by the main user. Police's damage equals user's damage x 150%.

SOFTWARE DEVLOPMENT FOR GAME AI

This project consists of an extent of different techniques to support the creation of AI behaviour in games. By implementing and designing different characters, it creates an interaction between AI and standard game loop taken. The game and its bots can be tactically analysed, monitoring how each AI work in comparison to the others and its main goal. Actions in the game shows some steering movement models and attacking behaviour, path learning mechanism within each AI, impacting the game.

FORCED-BASED AGENT MOVEMENT

Using basic steering force models, AI can now have more realistic movement. Actions such as chasing, attacking, running yields individual physics, kinematics, mass etc. Even the object used as weapons by the character has its own mass and velocity. These actions can be simulated accordingly to the purpose of AI and game's goal.

GOAP

Designing an FSM is essential to guide out what is needed for the project. Using GOAP allows us to modify character's ability and stats. The game is monitored around a single goal and required actions to achieve victory/ an ordered list of corresponding events. Basic decision making of each AI is needed which can be evaluated by tactical analyses in order to perfect the AI according to the game's need.