

Product vision

WhySoSerious

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1 Introduction

Tygron is an online 3D multiplayer game engine for urban communities. A community can design and maintain a very detailed simulation of their area. In this simulation different stakeholders are able to interact and change the simulated environments to see how this effects the community. The local government of a city for example could use this simulation to see if their plan to renew the infrastructure would cause a significant change in noise pollution for the affected area's.

Just like in real life, the simulation contains a set of stakeholders each with their own goals and permissions. When one or more of these stakeholders is not willing or able to participate in Tygron's simulation the other stakeholders are required to fulfill those parts of the simulation. Since this is a lot of unnecessary work for them, Tygron has decided to simulate the actions of the missing stakeholders with artificial intelligence.

This is where we come in. We are working together with 4 other groups from the TU Delft to create a simulation with different stakeholders who compete and cooperate with each other to fulfill their goals. Afterwards we will use the goal language to create virtual agents that can simulate these stakeholders. These agents should be able to communicate with each other through the game to trade assets and reach certain compromises.

2 Target audience

The audience that is targeted is Tygron's customers, since we are aiming to enhance the services provided by the Tygron Engine. Tygron's customers typically are governors, ministers, project managers at companies and other stakeholders of terrain, buildings and facilities, already existent or in development.

3 Customer needs

The consumer needs our product will address are the people necessary for planning a city. As not all cities might be able to get a person behind each stakeholder for each session, our product will try to replace those people with bots. This makes the most important thing about the bots to be as human as possible. They also have to be able to make rational decisions that will benefit them and they will need to be able to cooperate with other humans and bots.

4 Product attributes

The agents we are going to program will be able to simulate the actions a human would do in their situations. For the purpose of creating these bots, we have defined five different possible stakeholders of which one we are going to implement:

1. Government

The government will ensure all stakeholders will abide by the rules. It will watch and maintain the green index, the amount of water in the area, the zoning. It might also try to fit in a AZC somewhere in the area.

2. Technical University of Delft

This stakeholder wants to maintain its campus. It will try to build more faculties, has plans to demolish the old Bouwkunde faculty, and build a new building, and it will want to renovate existing faculties. If possible, it will try to have enough parkings for each faculty, and a bit of green and water around and in the campus.

3. DUWO (student housing)

This stakeholder supplies housing to students. It will want to maintain a certain amount of houses for students, that have to be close to the university. It will search for both short term and long term solutions to reach this goal.

4. Civilian housing corporation

This stakeholder will build housing for the (non-student) civilians in the area. These civilians rather don't live too close to students, and want the area to be green enough.

5. Companies

This stakeholder will want to build facilities close to the civilians and the students, like parkings, supermarkets and recreation. This stakeholder will focus on making profit, rather than keeping the area livable.

Apart from these requirements, all of the stakeholders will also try to avoid bankruptcy.

We have been assigned the DUWO stakeholder, so we will specify this stakeholder in detail now.

The DUWO stakeholder will want to build housing for students. Many students want to live at least their study duration in their student home, and some students will want to sacrifice comfort for speed: They come from over the border so they are not able to commute to the campus, so they need a student home close to the campus before their study starts. Students will also want to live close to the campus.

5 Comparison with competitors

Since no such functionality exists yet in the Tygron Engine there is no direct competitor. Our agent has to cooperate with real human stakeholders and other agents, so they cannot really be seen as competitors. We are, though, replacing human stakeholders that are not able to engage in the game sessions themselves. This can occur for the following reasons:

1. The stakeholder has not enough time to go through the entire game session.
2. The stakeholder has at the moment not the available hardware required to run the session.
3. The stakeholder has no working internet connection.

Our agent will not experience any problems with the first two issues, because it has to be run on a computer which also runs the Tygron Engine Client, and it can be set to run any time of day without limitations.

6 Target timeframe and budget

Our target timeframe to finish this product is 10 weeks, as long as the current education period of the TU Delft. The first two weeks will be used for orientation within the project and setting up a game environment with the other teams in which our agent will operate. The remaining weeks are reserved for creating and enhancing the DUWO student housing agent. Since we are only programming and no one is being paid we do not need a budget.