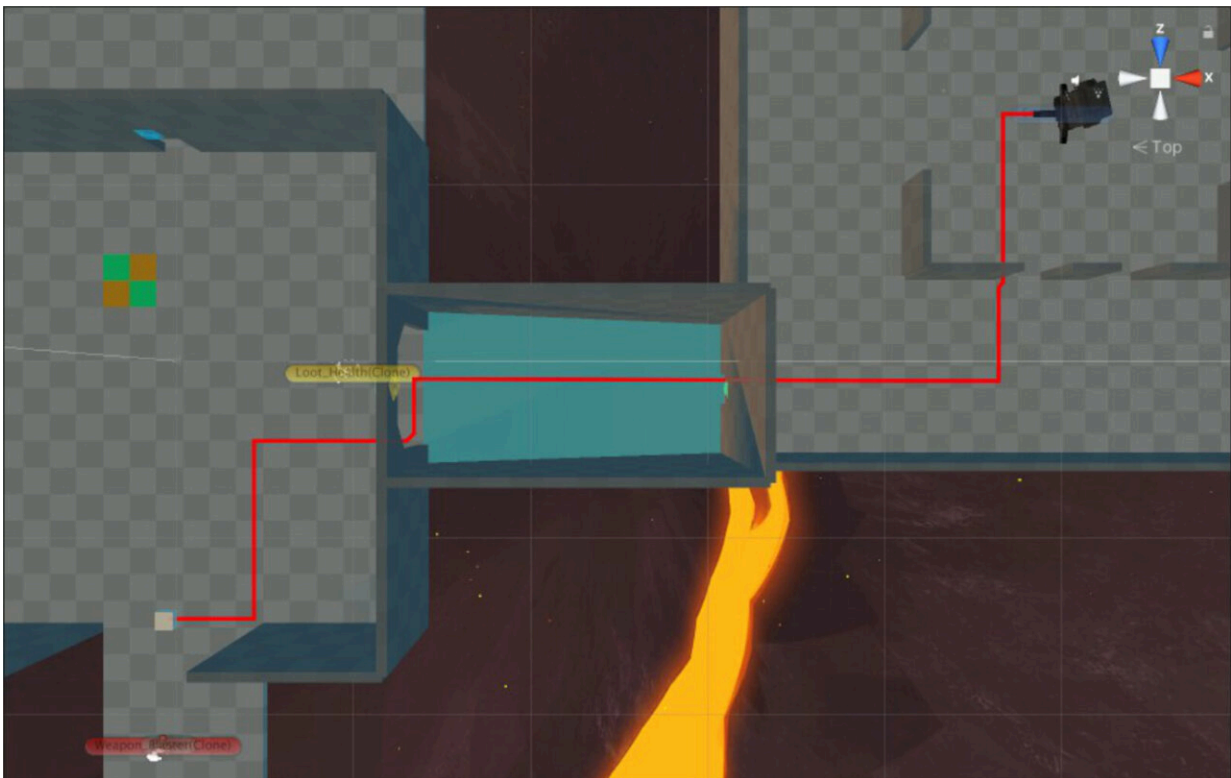# Game lab provides accessibility toolkit for the game engine Unity

March 11 2024, by Falko Schoklitsch

The navigation agent uses an audio signal to guide players to their destination along a pre-calculated route. Credit: Klemens Strasser

The growing popularity of video games is putting an increased focus on their accessibility for people with disabilities. While large productions are increasingly taking this into account by adding accessibility features, this aspect is usually completely absent in indie productions due to a lack of resources.

To facilitate the implementation of accessibility features, Klemens Strasser developed a freely accessible toolkit for the Unity game engine as part of his master's thesis at the Institute of Interactive Systems and Data Science at Graz University of Technology (TU Graz). It is available for free on [GitHub](#).

This makes it easy to integrate support tools for people with [visual impairments](#) into a games project. Together with his master's thesis supervisor Johanna Pirker, Klemens Strasser has now published the toolkit and an action guide for more accessibility in games in a [paper](#).

Help with orientation

When creating the "toolbox," Klemens Strasser focused on four points:

- support in operating menus
- perception of the game environment
- control on a fixed grid
- free navigation if the character can move in all directions

The first three points could be solved with a screen reader, but for the free navigation, a so-called navigation agent had to be implemented. This guides the players to a destination they have specified via an audio signal

after it has calculated the route to get there.

For the screen reader solution to facilitate menu operation, environmental perception, and control on a grid, it was first necessary to capture all visible and usable objects and characters on the screen. A tool known as an accessibility signifier was used to recognize the elements and assign them a label, traits, value, and description. The game transfers this information to the screen reader used by the players, which reads it out to them.
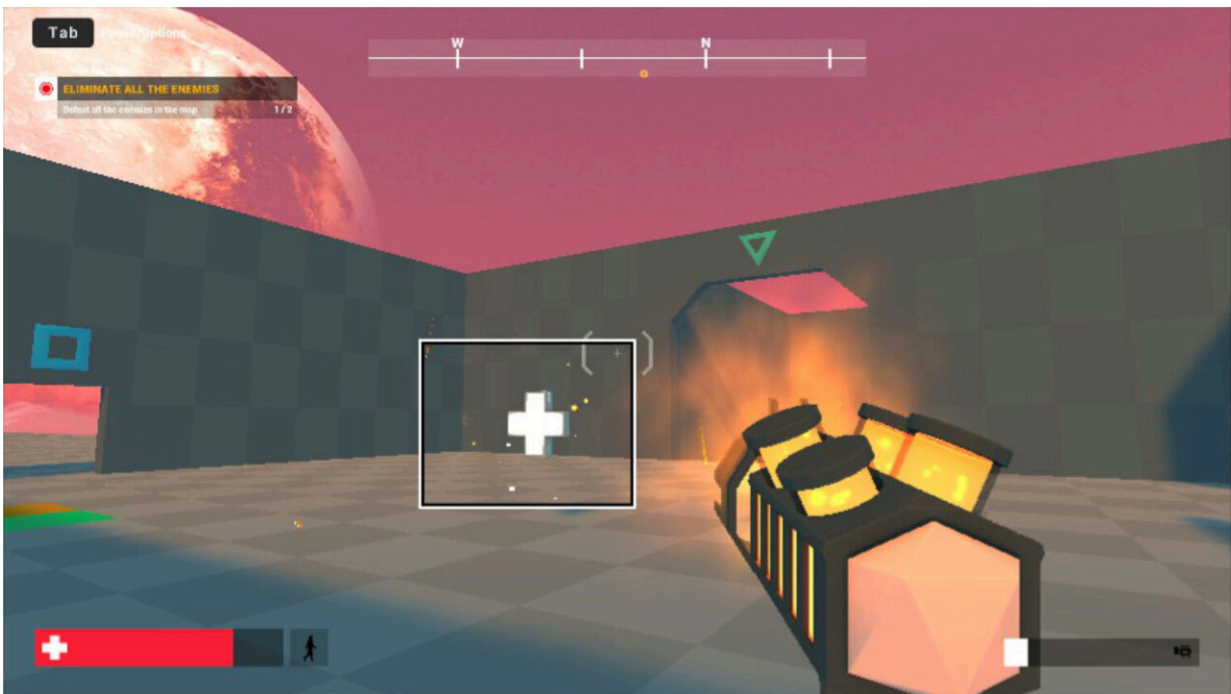
Visible and usable objects are marked and their information is communicated via a screen reader. Credit: Klemens Strasser

Developers with positive feedback

The toolkit was evaluated in a test with nine [game developers](#), all of whom have a university background in software engineering. Their task was to implement it in a simple match-3 game in which the aim was to arrange three identical symbols or elements next to each other by moving them.

The feedback from the developers was consistently positive. The implementation was described as simple, the task was easy to understand, and they comfortably found their way around the toolkit. Before the test, only three of the developers had worked with accessibility features, but afterward, most of them wanted to use them for their next project.

"Games should be open to as many people as possible, which is why it is so important to make them more accessible for people with disabilities," says Klemens Strasser.

"With the Accessibility Toolkit for Unity, we want to make it as easy as possible for indie developers to implement these options. Since according to the WHO, 253 million people worldwide live with a visual impairment; this would include a very large group. Nevertheless, there is still a lot to be done here, as there are numerous other impairments for which easy-to-implement solutions should be provided."

The Game Lab at TU Graz is constantly carrying out research on such solutions and other topics relating to accessibility in computer games.

Years of success as an independent game developer

Klemens Strasser himself has been working on the topic of accessibility for games for several years. Even during his studies and after completing his Master's degree in Computer Science at Graz University of Technology (TU Graz), he independently developed games that take

accessibility into account.

In 2015, he won the Apple Design Award in the Student category with his game Elementary Minute and was nominated for the award in the Inclusivity category in 2022 with Letter Rooms and in 2023 with the Ancient Board Game Collection. His games published for iOS have been downloaded over 200,000 times to date.

More information: Paper: scholarspace.manoa.hawaii.edu/ … 4aed261b69ab/content

GitHub: github.com/KlemensStrasser/KAP

Provided by Graz University of Technology