



Game research
for training and
entertainment

Pushing the frontier

The GATE research theme Modeling the Virtual World focuses on techniques for semi-automatically creating virtual worlds that can be used in games and training scenarios. The motivation for this research is that the creation of the worlds has become one of the most costly parts of the construction of games. Also, if we want to create adaptive games it is important that the game world can be created and changed on the fly. The GATE project focuses on three aspects: the automatic creation of virtual worlds based on real-world data (like images and laser range scans), the automatic creation of imaginary worlds (for example with an editor for dynamic terrains), and the affective appraisal of virtual worlds (measuring how a user experiences a virtual world in relation to the real world counterpart).

To process laser range point clouds, we have explored separating the point data into a cluster per surface. For each surface, we then construct a fitting boundary. Fixing the shape of the surface boundaries to rectangular may fit many of the clusters in an urban scene, but some surfaces will not conform to a rectangular boundary. Even if we were to extend our method to be able to identify the surfaces conforming to any arbitrary shape, we would still be limited by the fact that this shape needs to be pre-set. For this reason we explored data-driven ways of bounding the surfaces. These methods should be able to determine the shape of the boundary from the point distribution. In addition to measuring the world, we designed an intuitive sketching interface that can be used by non-expert terrain

modelers (e.g. training game instructors). This posed a number of challenges, since procedural methods typically generate too arbitrary results. In contrast, for our purpose the terrains have to be constrained by the features of the terrain declared by the user. This gives us the ability to automatically maintain the consistency of the virtual world model throughout the modeling session, alleviating the amount of manual modeling required by designers and stimulating their ability to experiment.

The affective appraisal of virtual worlds, whether reconstructed or generated, is influenced by many factors like the detail and lighting in the virtual scene, the display size, the presence of sound, and the comfort level of the users. Various experiments were performed to measure these effects. For example, the effect of cyber sickness and stress on the affective appraisal was measured. Also the effect of detail (and dirt) and weather conditions in the virtual scenes were measured.

In all these cases, further innovation is needed. Novel reconstruction methods, new generation techniques, and further users studies are necessary to push the frontiers of the state of the art in modeling the virtual world. The GATE project goes on.

Remco Veltkamp, Utrecht University.



Dutch Game Valley

Recently, a number of initiatives have strengthened the development of a true "Dutch Game Valley". Not only does the municipal and province of Utrecht support the development of a lively ecosystem for the gaming industry, also the European Union and the government invest in the Dutch game industry. The recent investment of 4 M€ via the Dutch Game Garden stimulates innovation and employment. This Utrecht based incubator facilitates students, start-ups, and other companies in the Dutch game industry.

The next generation employees must be educated now. Indeed, the HKU and Utrecht University offer specific studies on game development. Also, together with TNO, they participate in the center of expertise AGS - Advanced Gaming and Simulation, and in the GATE project. Both AGS and GATE are supported by the executive board of UU, which has lead for example to a Motion Capture Lab at UU. Most recently, Microsoft and Utrecht University teamed up, and opened a Gamelab, next door to the Motion Capture Lab. See the photo for an impression of the opening festivity. It is a place for students Game Technology to design, implement, and play games, using hardware and software provided by Microsoft, such as the Xbox, Kinect, and C#. Prof. dr. Mark Overmars is closely involved in this initiative. "The programming language C# is very suitable to teach and learn programming and is used in our programming classes. XNA give students a flying start, so they can make impressive games in their first programming course. The Gamelab challenges students to keep on working on exciting gaming projects, as part of, and outside their study."



Crisis management training for Mayors; 15 min, single-player

Solve a crisis in 15 minutes!

At this moment mayors have one way to train for possible future crises: table-top exercises. We came up with an additional way based upon serious gaming, brief, single-player and anonymous.

Designing a serious game for mayors is a challenging project. It does not include cutting edge 3D visuals. However it does include the challenge to create a 15 minute serious game for an audience that is not commonly known for its love for games. For this game to be a real addition to existing training methods there were specific conditions: (1) the game supports learning in max. 15 minutes; and (2) is a single-player game, to make it easier to arrange a training session.

Our challenge was to create a serious game that allows mayors, who have hardly time in their busy schedule, to train more often for crisis management tasks. Involvement of the target audience was no option. Instead we involved a group of people – a focus group - to help us out with learning goals, context and most important our challenging conditions: 15 minutes play-time, anonymous, and single-player.

To design a serious game like this we worked with three groups of experts in our team: 1. Game experts; to make a game entertaining, motivating and look good; 2.

Educational experts; ensure that the learning goals can be reached by playing this game; 3. Domain experts, help the team with the content of the scenarios.

The team built a paper-based game first. The focus group could play a first round in November 2009. With some brief revisions we were able to take our game to a next level in 2010: a first digital version, a mock-up. Early 2011 our final prototype was ready.

While the developers were looking for ways to translate the (paper) game-elements into digital components (mock-up), the educational experts set up an experiment. With 24 students from the Haagse Hogeschool the paper-based game was played. We found that where most tested elements did not change, there was (expected) improvement in the element Reflection. With our prototype an experiment is run, involving 60 students from the Haagse Hogeschool, hoping to find statistical evidence for our earlier found improvement on reflection.

Reflection is an important skill for mayors in crisis management. It helps them to learn from previous experience, even when that was a game. It will learn what information is needed in an actual situation, and which advisor should be heard in these situations. We do this by actually forcing players in the game to decide 'yes' or 'no' given a strategic dilemma, providing food-for-thought.

Since October 2010 35 mayors played the mock-up game, and discussed the dilemmas of a family drama. In this scenario a father killed his 2 kids, and then committed suicide. The mother escaped. One example of a dilemma that seems easy at first is: "Will you join a silent march?". Although this might seem simple, you might overlook (the scenario doesn't tell) the fact that the father might have killed before, there might be a history of abuse in the family, or the children themselves might not have been such sweethearts... However by being present you might be able to explain the role of the emergency services, or you might be able to...

Partners in the project 'Pilot Safety' are Hogeschool voor de Kunsten (HKU), Thales, TX-change and TNO. Artists at the HKU have helped to design the game and they have created the artwork. Developers at Thales and T-Xchange have developed the mock-up and online version of the game. Researchers at TNO have developed the educational base for the game, as well as brought in their experience with the target audience (mayors). Project leader and contact person for this project: Josine van de Ven; josine.vandeven@tno.nl

