SERVICE

GATE
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 lifely 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 languate 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."