Game research for training and entertainment

GATE Newsletter

Issue 10
November 17, 2009

First Knowledge Transfer Projects Have Started

During the past months a considerable amount of effort has been put in the definition of GATE knowledge transfer projects. Three of these projects have been started in the meantime, two more are in the final stages of the decision process and some more are currently being defined. Needless to say, the knowledge transfer projects are very important for the GATE project. They demonstrate that the research results developed in the project are of great importance to Dutch industry. Through the projects industry can benefit from the achievements of the GATE project. In this newsletter you find some information about the three projects that have been started.

We have also installed the advisory board for the GATE project. This board will advise the management of the project on all aspects. In particular we expect the advisory board to play an important role in the definition of further knowledge transfer projects, dissemination of the project results, and plans for a continuation of the project.

KTP: CycART

CycART (Cyclorama based Automatic 3D Reconstruction Tools) is a knowledge transfer project between Utrecht University and CycloMedia Technology. The project is led by Remco Veltkamp (remcov@cs.uu.nl). The project is performed in conjunction with the GATE research work package 1.1: World Generation Based on Real Data.

The goal of the project is to improve the current 3D reconstruction techniques, so that they can be used to do 3D reconstruction of an urban environment on the basis of Cycloramas. Our approach is to extend the existing area-based and feature-based techniques. The hybrid approach to be developed is expected to result in a 3D registration of the environment and 3D Cycloramas of higher quality than can be derived using other methods.

KTP: CIGA

CIGA (Creating Intelligent Games with Agents) is a knowledge transfer project between Utrecht University and VStep. The project is led by Frank Dignum (dignum@cs.uu.nl). The project is performed in conjunction with the GATE research work package 4.1: Adapting the Game to the World.

In order to use serious games for training it is necessary for the virtual environment to react natural and adequate to the actions of the trainee. The virtual characters, of course, form an important part of the environment. The use of agent technology seems a good fit to implement these characters in order to provide them with natural, adaptive behavior. This is also done in several of the work packages of GATE. However, the agent technology cannot simply be coupled to the technology of the game engines. Both the agents as well as the game engine assume they have total control over the system.

In this project we want to use the experience we got as a result of coupling agents to several game engines as a base for the development of generic middleware to facilitate the coupling. We aim at providing support tools for the implementation of such middleware to enable the coupling of diverse agent platforms and game engines as well as developing a methodology to support game designers in the design and implementation of games with agents.

KTP: VidART

VidART (Video Analysis and Recognition Tools) is a knowledge transfer project between Utrecht University and Noldus Information Technology. The project is led by Remco Veltkamp (remcov@cs.uu.nl). The project is performed in conjunction with the GATE research work package 3.2: Detecting, Interpreting and Affecting User Behavior.

The goal of this project is to develop a prototype toolbox for the automatic analysis, classification, and annotation of the behavior of people from video, in particular with respect to pose and gestures. The application domain is an indoor environment where multiple people are present and walk around or are seated. The deliverables of the project are a toolbox of software modules that can be used for interaction in gaming and training. The Observer XT will be the integration and validation platform. This will support easy evaluation of the developed toolbox, and allow usability testing.

Virtual Crying

Some of the recent research in virtual characters at Utrecht University has focused on displaying realistic facial expressions. In particular, Wijnand van Tol and Arjan Egges have looked at the simulation of crying motions.

Displaying facial motions such as crying or laughing is difficult to achieve in real-time simulations and games. Not only because of the complicated

simulation of the physical characteristics such as muscle motions or fluid simulations, but also because one needs to know how to control these motions on a higher level. We have developed a method that uses the MPEG-4 Facial Animation standard to control a realistic crying face in real-time. The tear simulation is based on the Smoothed Particle Hydrodynamics technique, which we optimized for real-time tear generation and control. Through simple parameters, a wide range of expressions and tears can be generated on the fly. Additionally, our method works independently of the graphics and physics engines that are used.

This work was presented at the IVA09 conference, which was organized from 14-16 September 2009 in Amsterdam by the University of Twente. For more information please contact egges@cs.uu.nl.

Detecting Pose Information

By Feifei Huo, TU Delft

Nowadays video-based applications have become more and more widespread. A well-known video-based application is man-machine interaction, in which people can use their facial expressions, gestures and poses to control e.g. virtual actors or (serious) games. The essential ingredient for an effective man-machine interaction experience is that the system indicates its level of understanding of the user's movement. Therefore, human motion analysis plays an important role in man-machine interaction. Generally, there are two approaches to obtain the movement of human body. One approach is marker-based, in which users need to wear specific suit with sensors on it. These sensors are used to capture the motion of different body parts. The other approach is vision-based, in which users are totally free of any obtrusive sensors. Compared with marker-based approaches, vision-based approaches may have less accuracy of reading motion information. However, it is more convenient for users, especially for gaming applications.

Therefore, we propose a vision-based people detection, tracking, and pose recognition system. It directly uses the captured video frame as input, and then gives the 2D position and pose of the people if there are people appearing in the scene. Some of the experimental results are shown in Fig.1. People's head and torso are indicated with yellow and red rectangles. Within this 2D model, the location of head top, head center, torso center, torso bottom and both shoulder can be estimated, which are presented by yellow and red crosses. People's left and right hand are marked with blue and green crosses respectively. The output of the pose recognition system is an integer, the number shown in Fig.1. It gives the indication which pose the user is performing. This integer and the 1D (horizontal) position of the user will be used as the control command of a spatial game, Phong.

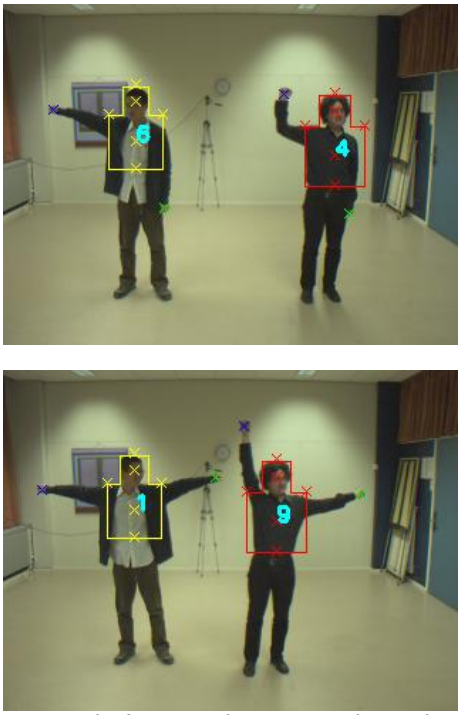


Fig.1. Results from people segmentation and pose recognition.

In Phong the player controls a bat which has to bounce off photons, see Fig.2. The position of the bat is determined by the player's position in front of the camera. The photons can have 6 different colors: red, blue, green, yellow, cyan and magenta. The bat can change into each of these colors when the player adopts the appropriate pose. The pose recognition system sends two types of data to the spatial game in every time step. It sends an integer that represents a pose (1-9) and an integer representing the 1D-location of the player. Fig.2 gives a screen shot of user playing the game. On the left side is the interface of the game, which shows the level, bounces, heat and score of the player. The three windows on the right side are the results from vision-based analysis. From top to bottom, they are original image, results from body parts segmentation and pose recognition, and foreground binary image. This pose-driven spatial game is a real time man-machine interaction without obtrusive sensors. It shows the possibility of a new way of interactions in novel computer games and entertainment. The combination of computer vision research and a practical application is quite useful. It allows us to directly test if the proposed algorithm satisfies certain requirements, in a specific application environment.

Game research for training and entertainment

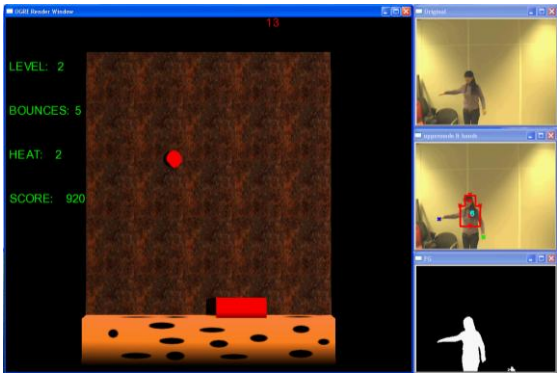


Fig .2. Spatial game interface. On the left side is the interface of the game, which shows the level, bounces, heat and score of the player. The three windows on the right side are the results from vision-based analysis. From top to bottom, they are original image, results from body parts segmentation and pose recognition, and foreground binary image.

GATE Advisory Board

An advisory board for the GATE project has been installed. The board consists of the following people:

- Michael Bas (RANJ)
- Arjan Brussee (Guerrilla Games)
- Frank van Oirschot (Dutch Games Association)
- Gerard van Oortmerssen (ICTRegie)
- Martin de Ronde (One Big Game)
- Pjotr van Schothorst (VStep)
- Jan-Pieter van Seventer (Dutch Game Garden)
- Rogier Smit (PlayLogic)

Joost Raessens Full Professor

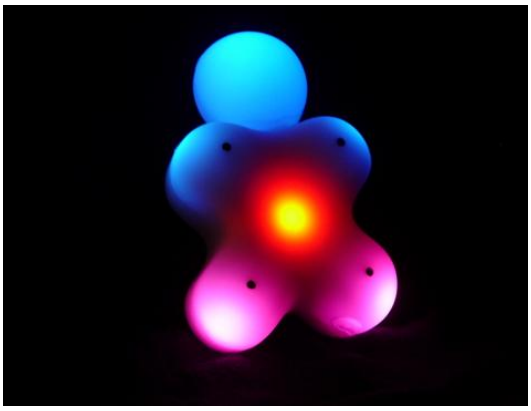
Joost Raessens, project leader of the work package *Design rules for learning through simulated worlds*, has been appointed Professor of Media Theory at the Department of Media and Culture Studies, Faculty of Humanities, Utrecht University. Raessens deploys the notion of play as a conceptual framework for the analysis of media use. His research focuses in particular on playful identities and on learning through computer games. For more information, see: www.raessens.nl. We congratulate Joost with his new position.

Program Coordinator HKU

The Utrecht School of the Arts has attracted a new member for the team working on GATE. In September Willempje Vrins started as the program coordinator of the 'Applied Game Design' research group. The group integrates creative design and research and works on several innovative game applications. Willempje Vrins will be working on the GATE pilots Education, Health and Safety.

Scottie 2.0

Waag Society joyfully announces the birth of Scottie 2.0. Lots of improvements have been implemented: Scottie 2.0 now enables users to send each other knocking sounds and to play a light game. In order to play this game, users are invited to discover the game rules by themselves. Scottie 2.0 has lost some weight and is therefore easier to handle for children. Battery lifetime has increased.



At the end of the year Scottie expects to have 30 brothers and sisters. They enable Waag Society and partners to observe them in their preferred habitat, with ill children and their loved ones.

Scottie is developed as part of the pilot Health of the GATE project.

Creative Game Challenge

This year Utrecht University organizes the Creative Game Challenge, a game creation competition for all students in VWO, HAVO and VMBO. It is sponsored by a number of parties, among which the GATE partners TNO and ICTRegie. The theme of the competition is Beasts. Through the competition we hope to increase the interest of students in Computer Science in general and game technology in particular. For more information about the competition see www.creativegamechallenge.nl.

Internal Events

Here we list interesting meetings and events organized by GATE or its partners. Please notify us of events that should be added, by email to rita@cs.uu.nl.

- 15 January 2010: Meeting Dutch game researchers, Utrecht. The next meetings will be on April 23 and June 16. More information will be made available through the GATE website http://gate.gameresearch.nl.

Game research for training and entertainment

Events in the Netherlands

Here we list interesting meetings and events in the Netherlands. Please notify us of events that should be added, by email to rita@cs.uu.nl.

- 18 march 2010: ICTDelta, Rotterdam. http://www.ictdelta2010.nl. ICTDelta is the yearly meeting organized by ICTRegie. This year it will become an inspiring festival of ICT research and innovation in the Netherlands.
- 24-27 August 2010: Measuring Behavior 2010, Eindhoven. http://www.measuringbehavior.org. The call for symposia and workshops is now open. The deadline is 5 January.
- 12 July – 6 August 2010: Sixth International Workshop on Multimodal Interfaces (eNTERFACE/10), Amsterdam. http://enterface10.science.uva.nl. Until the end of November people can submit proposals for workshops.

Acknowledgements

It is important that all publications that are (partially) the result of the GATE project contain an acknowledgement with the following text:

"This research has been supported by the GATE project, funded by the Netherlands Organization for Scientific Research (NWO) and the Netherlands ICT Research and Innovation Authority (ICT Regie)."

Or in Dutch:

“Dit onderzoek werd mogelijk gemaakt door het GATE project, ondersteund door de Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) en het Nationaal Regieorgaan voor ICT-Onderzoek en -Innovatie (ICT Regie).”

Please realize that also the publications of employees that are used as matching for the GATE project must contain such an acknowledgement. Please send a pdf file of each publication to Rita Jansen (rita@cs.uu.nl). These are important for the yearly reports and for the archive. All publications will be made available through the website.

Colofon

Address: Rita Jansen, Department of Computing Sciences, Universiteit Utrecht, P.O. Box 80.089, 3508 TB Utrecht, the Netherlands.
Editors: Piet Buitendijk and Mark Overmars.
Contributions: Please send to markov@cs.uu.nl.
Administration: Please report new or left employees or changes in email addresses to rita@cs.uu.nl.
Website: http://gate.gameresearch.nl