Bamse-land: A Virtual Theatre with Entertaining Agents Based on Well-Known Characters

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ABSTRACT
The virtual theatre *Bamse-land* is an entertaining virtual world, where characters taken from the Swedish comic book *Bamse* are implemented as autonomous agents. The agents interact with each other according to their different personalities, which were derived from the comic. Our main concern has been to make an entertaining and believable application, and by keeping the algorithms non-complicated show that there can be easy solutions to the problem of designing believable agent applications. Experiences with users show that entertaining agents based on well-known characters bring many advantages, including a simplified design process and higher user involvement.

Keywords
Believable agents, entertainment

INTRODUCTION
The concept of "Virtual Theatre" is vague and there seems to be no commonly accepted definition of the term. In this paper we mean by that term a virtual world inhabited by autonomous agents that are acting and interacting in an independent way. These agents may follow a pre-determined manuscript, or act completely on their own initiative. They also have their own personalities and moods. From the agents' point of view their world is an isolated place – they do not know about anything apart from the environment they inhabit.

There are many examples of virtual theatres. The *Woggles* are depicted as small oval-shaped creatures, inhabiting a world where they can interact with each other [2]. The Woggles world has been used to examine directed improvisation [4]. The *ALIVE* project featured virtual animals which users could interact with in an unencumbered way [5]. There are also commercial products, e.g. the computer game *Creatures*, where the players can breed their own creatures that live in an animated world [3].

However, one thing most existing applications have in common is that they are complicated. We had the goal to make an interesting virtual theatre with simple and under-standable code. We also felt that it would be easier, both to write the program and to keep the users' interest for a longer while, if we used well-known characters.

THE THEATRE: BAMSE-LAND
The characters live in the Valley, which in the computer is represented graphically by a map containing some houses and a forest. On the map the icons representing the agents act and interact in different ways: they walk around; meet other agents; talk; give, take or steal things; harass and comfort each other; etc.

The Characters Used in the Theatre
The characters are based on the Swedish comic *Bamse*, created by Rune Andréasson [1]. We have chosen those characters for two reasons: Firstly, their personalities are simple and exaggerated, which makes it easy to understand why they are acting the way they are and to empathize with them. Secondly, because most people in Sweden know about the characters and therefore do not need to be introduced to them. Although this makes our application mainly of interest to Swedish users, these principles can be applied to other characters well-known to the expected users. The following characters were used:

Bamse is a kind bear. The most important fact about him is that he gets strong by eating Grandma's homemade honey (compare Popeye and his spinach). Whenever someone is naughty to someone else, Bamse chooses to either comfort the victim, by giving him or her a kiss, or punishing the villain, by eating some honey and throwing him or her into a corner.

Grandma is your typical grandmother, cooking food for everyone who is hungry, even the bad guys. Furthermore she prepares Bamse's honey according to a secret recipe. She gives the honey to Bamse, or lets her cat Janson deliver it.

The Wolf is the bad guy. He steals things and harasses everybody except Bamse (since he does not dare to). If he gets hold of some honey he eats it, because he too wants to get strong. But instead he – like everybody else who eats the honey, except Bamse – gets a stomachache for three days.

Apart from these three, there is also **Little Hop**, a nervous rabbit who always runs away when in danger; **Mr. Turtle,** a genius and an inventor – the Einstein of the Valley; **Janson,** Grandma's cat who likes to tease The House Mouse; **The House Mouse**, a mouse who likes to tease

Janson; and **Croesus Vole**, a field-mouse version of Scrooge McDuck – rich and cheap – only more wicked.

THE IMPLEMENTATION

The program was mostly written in Prolog, and for the graphics we used Tcl/Tk. It runs on Unix systems. The agents' different personalities (e.g. that The Wolf likes to harass people or that Grandma cooks) are coded as Prolog predicates. Their moods (e.g. hunger or exhaustion) and goals (e.g. that Bamse wants to comfort Little Hop or that The Wolf wants to get strong by eating Bamse's honey) are stored in Prolog lists. This is because the moods and the goals change over time, but the personalities are constant.

The main idea with the program is easy: Simply process each agent in turn and try to accomplish their goals by making decisions and act accordingly. The goals have different priorities – e.g. to be hungry is a more basic need than wanting to harass someone, so hunger has a higher priority. Each agent in turn tries to find an action bringing it closer to the fulfillment of the most important goal. If the agent can't find such an action, it tries to fulfill the second most important goal, and so on.

AN EXAMPLE SCENE

This is a small example run of the program, together with explanations. In this scene, there are only three actors: Bamse, Grandma and The Wolf.

Grandma is on her way to Bamse with a jar of honey. On the way she passes The Wolf, who sneaks up to her and steals the honey. Figure 1 shows the current situation.

Figure 1: A snapshot from the program. The Wolf has just stolen a jar of honey from Grandma.

The agents now get different goals: The Wolf wants to get strong by eating the honey. Grandma is now out of honey so she will go back to her house to cook some more. Bamse gets pretty upset with The Wolf, and therefore wants to punish him by throwing him into the corner.

The Wolf, with the goal to eat the stolen honey, walks away into the woods to find a calm place where he can eat. Grandma starts walking home to cook some more honey. Bamse, who wants to punish The Wolf, first needs some honey. So he walks after Grandma.

After a while The Wolf will have eaten the honey. But, since he is not Bamse, he gets a stomachache for three days. Meanwhile Grandma has cooked more honey and given it to Bamse. Then Bamse goes after The Wolf to make him repent his crimes, by throwing him into a corner.

USER EXPERIENCE

The program has been informally tested on a small number of people of various ages. At first, they found it hard to get into the story line, but after some explanations they got quite hooked. The users thought that the use of well-known characters was successful – it was much easier to follow the plot when they knew what to expect of the characters.

The main problem was that it was hard to see exactly what goals the agents were following. To make the program more engaging, they suggested that the graphics should better express the emotions of the characters.

FUTURE WORK

This is a prototype, not a complete system, but the ideas inherent in the design may be applied to other applications. One of the most obvious would be adventure games. Educational applications for children might also benefit, by keeping the children's attention for a longer time.

Possible extensions are to insert a pre-determined story or to let the user interact with the theatre, making him or her the director. With a pre-determined story, the user will know what to expect from the play and might watch the actions with greater interest. If the user could also decide what is to happen to the different agents at certain moments in the play, he or she might find it yet more interesting to pursue the story.

CONCLUSION

We have shown that it is possible to create an interesting agent application with simple programming techniques. The use of well-known characters simplified the programming and design of the agents, and increased the users' involvement in the world and its inhabitants.

ACKNOWLEDGMENTS

REFERENCES

1. Andréasson, R. *Bamse, världens starkaste björn*, Serieförlaget AB, Sweden, ongoing 1973–present.

2. Bates, J. The Role of Emotion in Believable Characters, *Comm. of the ACM*, Volume 37, Number 7, ACM Press 1994.

3. Grand, S., Cliff, D. and Malhotra, A. Creatures: Artificial Life Autonomous Software Agents for Home Entertainment, *Proc. of Autonomous Agents '97*, ACM Press 1997.

4. Hayes-Roth, B. and van Gent, R. *Story-Making with Improvisational Puppets and Actors*, Knowledge Systems Laboratory Report, KSL-96-05, Stanford University, January 1996.

5. Maes, P. Artificial Life meets Entertainment: Inter-

acting with Lifelike Autonomous Agents, *Comm. of the* ACM, Vol. 38, No. 11, ACM Press 1995.