The Role of Robotics in Second Life

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Abstract

This paper presents a project of the University of Siena whose aim is that of developing and investigating the role and potentials of robotics platforms in SL.

1 Introduction

In recent years development of online virtual reality simulated worlds for socialization have been arapidly growing. Linden Lab's Second Life (SL), www.secondlife.com, is perhaps the most relevant [7]. Differently from other social networks, SL efficiently implements the idea of a full 3D environment where each users are identified with avatars able to move in full 3D environments. While current capabilities of these environments are certainly limited from a technological point of view, with respect to the level of development of videogames, medical simulators or other simulation systems, it is easy to foresee a growing diffusion and consequent impact in the next few years.

2 Robotics in SL

This paper describes a project that has been recently supported by the IEEE Robotics and Automation Society whose aim is that of establishing a point of presence in Second Life [8].

The first objectve is that of reproducing in SL simplified behaviors of real world robots, such as for instance mobile robots, AIBO-like robo-pets or auto-responding desk assistants and others. The second goal is dissemination. We want to present the robotics culture to a broader community through the SL community..

Work is in progress. In Figure 1 a team of three mobile robots following an avatar is presented. The team behaviour is based on a leader–follower scheme where the green one is the follower of the blue one which is the follower of the red one which follows the avatar. Work is in progress also to develop robotics arm as in Figure 2.

We have also planned to realize a building on a SL land to set up a IEEE Robotics and Automation Society presence in Second Life. The map of the builging is circular as reported in Figure 3: The IEEE RAS area will consists of an auditorium for conferences, private buildings for IEEE sections and meetings and finally free spaces where humansand robots can interact each other, see Figure 4.

Figure 1: Robotics team behaviour in SL.

3 Social Interation

The main objective of this project is that of investigating the potentials of using robotics in second life. Two are the main issues.

The first consists of using robots instead of human operators, in order to provide SL users with information or to support these ones in their travels. The idea of using robots as a receptionist is already adopted in the real word, especially in Japan. Here we can find some robot receptionists that greet visitors and employees at corporate offices.. In Tokyo we can see arm-waving robots even directing the traffic. Japanese companies can rent an electronic receptionist shaped like Hello Kitty [5]. Virtual offices require receptionists. The problem they are expensive and in a world wide community they should be available 24 hours per day. The choice of a robot receptionist instead of a human operator seems to be a possible solutions to reduce cost. In particular, we plan to use robotic receptionist to provide to visitor with information about the IEEE Robotics and Automation Society.

The second main issue is to investigate the social interaction in heterogeneous communities of robots and humans. Recently, there has been a great interest in ethical and social implications of robots interacting with humans. The robotic technology is ready to make robots behaving as humans and the arising questions is about the ethical bounds on what robots should be programmed. The literature on this subject is very rich. The article [1] discussed on how to ensure that robots will never injure people while moving into their home and offices. The starting observation was that in 2005 there were 77 robot-related accidents in Britain alone and this number will increase when robots will move from industrial environments to everyday life places. Recently, several workshops and conferences have been held on this subject [2, 3]. The workshop on Robohetics [2], reported also in [4] investigated a relevant social issue: human reaction to the troubling presence of the humanoid.

These and other issues, such as the cooperation between robots and humans in performing tasks and actions are difficult to be investigated in the real world for two main reasons: robots are not available and safety is not guaranteed. These problems do not arise in SL: the project we are developing will provide robots available for experimenting social interaction with humans and Second Life is intrinsically safe for humans.

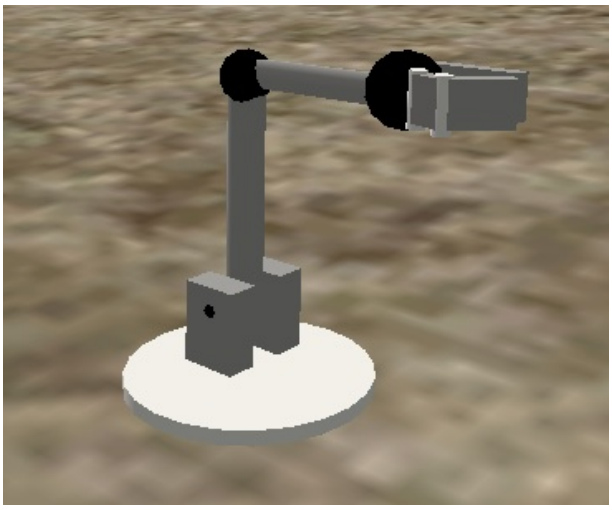

Figure 2: Simple robotic arm in SL.

One of the main critics to the SL community is that for most of the time, most of the places (buildings, stores, plazas, ...) in SL are not crowded if not empty [6]. We hope that populating part of SL with robots may help to partially solve this problem.

This project will contribute to invsetigate these issues by designing robotics platform in SL to design and test new social paradigms in human robots interactions.

4 Acknowledgments

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References

[1] "Trust me, I'm a robot" in Technology quarterly, The Economist print edition, June 8th 2006.

[2] "First International Symposium on Roboethics", Sanremo, January 2004

[3] "IEEE ICRA07 Workshop on Roboethics", Rome, May 1007.

[4] Bruce Sterling "Robots and the Rest of Us", Wired Magazine, Issue 12.05, May 2004.

[5] Diane Anderson "Can a robot replace your receptionist?," Business 2.0 Magazine, 11 April 2006.

[6] Frank Rose "Lonely Planet", Wired Magazine, Issue 15.08, August 2007.

[7] James Harkin "Get a (second) life", Financial Times, 17 November 2006.

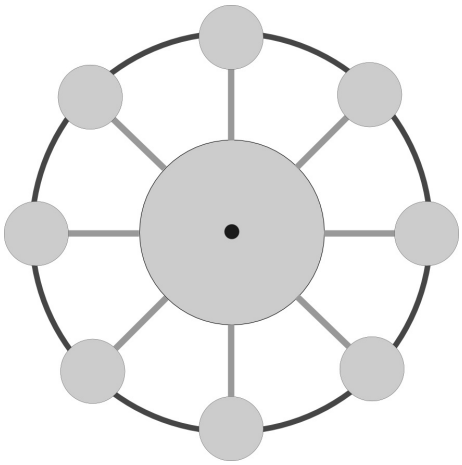

Figure 3: The map of the IEEE RAS building in SL.

Figure 4: The IEEE RAS building concept.

[8] "Robotics in Second Life" Project Supported by the IEEE Robotics and Automation Society. Winner of the IEEE RAS New Initiatives Competition, 2007. Advisor: Domenico Prattichizzo.