VIRTUAL WORLD AND MANIPULATION

Scientific advisor: Tuganova Luiza Djuraevna

e-mail: luizatuganova@mail.ru

Student of CSPU

Department English language and theory

Nurymbetova Zumrad Ruslanovna

e-mail: nurymbetovazumrad@gmail.com

Abstract

This article is about the acceptance of virtual environment (VE) technology requires scrupulous optimization of the most basic interactions to maximize user performance and provide efficient and enjoyable virtual interfaces. Motivated by insufficient understanding of human factors implications in the design of interaction techniques for object manipulation in virtual worlds, this paper presents results of a formal study that evaluated two basic interaction metaphors for virtual manipulation—virtual pointer and virtual hand—in object selection and positioning tasks.

Key words: article, technology, manipulation, virtual, methods.

Аннотация

Внедрение технологии виртуальной среды (VE) требует тщательной оптимизации самых базовых взаимодействий для обеспечения максимальной производительности пользователей и обеспечения эффективных и приятных виртуальных интерфейсов. В связи с недостаточным пониманием роли человеческого фактора при разработке методов взаимодействия для манипулирования объектами в виртуальных мирах, в этой статье представлены результаты официального исследования, в котором оценивались две основные метафоры взаимодействия для виртуальных

манипуляций — виртуальная указка и виртуальная рука — в задачах выбора и позиционирования объектов.

Ключевые слова: Статья, технология манипуляция, виртуальный, методы.

Annotatsiya

Virtual muhit (VE) texnologiyasini qabul qilish foydalanuvchi ish faoliyatini maksimal darajada oshirish va samarali va yoqimli virtual interfeyslarni ta'minlash uchun eng asosiy o'zaro ta'sirlarni sinchkovlik bilan optimallashtirishni talab qiladi. Virtual olamlarda ob'ektni manipulyatsiya qilish uchun o'zaro ta'sir qilish texnikasini loyihalashda inson omillarining ta'sirini etarli darajada tushunmaslik bilan ushbu maqola virtual manipulyatsiya uchun ikkita asosiy o'zaro ta'sir metaforalarini baholagan rasmiy tadqiqot natijalarini taqdim etadi—virtual ko'rsatgich va virtual qo'l—ob'ektni tanlash va joylashtirish vazifalari.

Kalit so'zlari: Maqola, texnologiya, manipulatsiya, virtual, metodlar.

Introduction

A virtual world (also called a virtual space) is a computer-simulated environment, which may be populated by many users who can create a personal avatar, and simultaneously and independently explore the virtual world, participate in its activities and communicate with others. These avatars can be textual, graphical representations, or live video avatars with auditory and touch sensations. Virtual worlds are closely related to mirror worlds. In a virtual world, the user accesses a computer-simulated world which presents perceptual stimuli to the user, who in turn can manipulate elements of the modeled world and thus experience a degree of presence. Such modeled worlds and their rules may draw from reality or fantasy worlds. Example rules are gravity, topography, locomotion, real-time

actions, and communication. Communication between users can range from text, graphical icons, visual gesture, sound, and rarely, forms using touch, voice command, and balance senses. Massively multiplayer online games depict a wide range of worlds, including those based on the real world, science fiction, super heroes, sports, horror, and historical milieus. Most MMORPGs have real-time actions and communication. Players create a character who travels between buildings, towns, and worlds to carry out business or leisure activities. Communication is usually textual, but real-time voice communication is also possible. The form of communication used can substantially affect the experience of players in the game. Media studies professor Edward Castronova used the term "synthetic worlds" to discuss individual virtual worlds, but this term has not been widely adopted.

What is the Virtual world?

The concept of virtual worlds significantly predates computers. The Roman naturalist, Pliny the Elder, expressed an interest in perceptual illusion. In the twentieth century, the cinematographer Morton Heilig explored the creation of the Sensorama, a theatre experience designed to stimulate the senses of the audience—vision, sound, balance, smell, even touch (via wind)—and so draw them more effectively into the productions.Among the earliest virtual worlds implemented by computers were virtual reality simulators, such as the work of Ivan Sutherland. Such devices are characterized by bulky headsets and other types of sensory input simulation. Contemporary virtual worlds, in particular the multi-user online environments, emerged mostly independently of this research, fueled instd by the gaming industry but drawing on similar inspiration. While classic sensory-imitating virtual reality relies on tricking the perceptual system into experiencing an immersive environment, virtual worlds typically rely on mentally and emotionally engaging content which gives rise to an immersive experience. Maze War was the

first networked, 3D multi-user first person shooter game. Maze introduced the concept of online players in 1973–1974 as "eyeball 'avatars' chasing each other around in a maze." It was played on ARPANET, or Advanced Research Projects Agency Network, a precursor to the Internet funded by the United States Department of Defense for use in university and research laboratories. The initial game could only be played on an Imlac, as it was specifically designed for this type of computer. The first virtual worlds presented on the Internet were communities and chat rooms, some of which evolved into MUDs and MUSHes. The first MUD, known as MUD1, was released in 1978.

What is the manipulation?

Manipulation is using "skills to advance personal agendas or self-serving motives at the expense of others", and is usually considered antisocial behavior. Pro-social behavior is a voluntary act intended to help or benefit another individual or group of individuals and is an important part of empathy. Different measures of manipulativeness focus on different aspects or expressions of manipulation, and tend to paint slightly different pictures of its predictors. Features such as low empathy, high narcissism, use of self-serving rationalisations, and an interpersonal style marked by high agency (dominance) and low communion (i.e. coldheartedness) are consistent across measures. Manipulation differs from general influence and persuasion. Non-manipulative influence is generally perceived to be harmless and it is not seen as unduly coercive to the individual's right of acceptance or rejection of influence. Persuasion is the ability to move others to a desired action, usually within the context of a specific goal. Persuasion often attempts to influence ones beliefs, religion, motivations, or behavior. Influence and persuasion are neither positive nor negative, unlike manipulation which is strictly negative.

Methods

This section describes the proposed interaction method for manipulating a virtual object. In this study, the tasks of manipulating virtual objects are selection, movement, and rotation. Translation and rotation are the most common manipulation tasks in a virtual environment and most similar to manipulating objects in the physical world. Before translating or rotating a virtual object, a user must select it. We first select a virtual object using ray casting, and then, design two interaction methods; we describe these procedures in detail in the followings section. After the virtual object is selected using ray casting, the tasks of translating the position of the 3D virtual object and rotating its angle are performed using a widget.

Research

Room-scale virtual reality (VR) is one where users explore a VR environment by physically walking through it. The technology provides many benefits given its highly immersive experience. Yet the drawbacks are that it requires large physical spaces. It can also lack the haptic feedback when touching objects. Take for example opening a door. Implementing this seemingly menial task in the virtual world means recreating the haptics of grasping a doorknob whilst simultaneously preventing users from walking into actual walls in their surrounding areas.

Result of discussion

The utilization of virtual worlds in education has emerged as a transformative approach in recent years. These digital environments provide immersive, interactive platforms where learners can engage with content in a manner that traditional classrooms often cannot offer. Virtual worlds range from highly structured simulations replicating real-world scenarios to more open-ended, creative spaces where imagination and innovation take the forefront. The versatility of these platforms allows for a wide range of educational applications, from

teaching hard sciences through detailed simulations, to fostering soft skills like collaboration and empathy in role-playing settings. These environments have been effectively used to simulate complex systems, visualize abstract concepts, and create engaging narratives for deeper learning experiences. Their use has been particularly beneficial in fields where hands-on experience is crucial but challenging to facilitate in a physical setting, such as medicine, engineering, and environmental sciences. The emphasis on virtual worlds as a catalyst for innovative teaching and learning methodologies resonates with the findings of Díaz, who advocates for the integration of virtual worlds with hybrid and mobile learning models to enhance educational accessibility and engagement. Similarly, the role of virtual worlds in facilitating collaborative learning experiences is echoed in studies by Griol and Callejas (2017), underscoring the versatility of virtual environments in nurturing creativity, collaboration, and problem-solving skills among learners.

Conclusion

Although virtual worlds, and 3D virtual environments more broadly, have been used in educational contexts for more than 20 years, there remains a great deal that we still do not know about how best to design and use them to maxi-mize learning effectiveness and outcomes. The contributors to this volume have explored a range of research topics related to the use of virtual worlds in education. Topics spanned human–computer interaction issues related to navigation, communication, identity formation, and authentic learning; lead-ing-edge technologies that have the potential to take learning in virtual worlds forward in new directions, with a specific focus on conversational agents and computer-controlled avatars; and considerations and frameworks for design-ing and implementing learning in virtual worlds. The contributions made by these chapters within the broad areas of human–computer interaction, advanced technologies, and learning design and implementation are discussed in turn in the

following parts before concluding with a summary of the main contributions of the book as a whole and the opportunities that exist for future research.

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