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ВИКОРИСТАННЯ МОДЕЛІ ПРИМИРЕННЯ ПРОТИЛЕЖНИХ СТОРІН У НАВЧАЛЬНОМУ ЗАКЛАДІ ТА ДЛЯ УПРАВЛІННЯ ЗНАННЯМИ

У роботі представлено інформаційну модель управління і контролю знань на базі «каналу» засвоєння.

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SIMULATORS IN EDUCATIONAL PROCESS

In article are considered as it is used training apparatus in educational process. Tributes examples of different training apparatus. Application of technologies of interactive training, virtual the laboratory is considered.

The requirements to modern training systems and complexes are very strict now. A number of training systems and simulators need to be completed with simulators of restart. Therefore the finished modern training system has to include besides means of "visual simulation" the means of "sensitive (restart) simulation". If you train somebody on purely computer simulators, there will always be a danger of preparing not real but "virtual experts" incapable of professional performance of real tasks. Thus, for example, the use of devices with the return tactile communication is not often replaceable. Not the small role by production of exercise machines and simulators is played also by the software. The software that is used in creation of modern computer games is generally used too. The software is created usually individually, depending on an objective. Time and cost of realization of trainers and simulators also depend on the specific project. Requirements to quality of graphics can be various and depend on the specific project. However, no less part is played by the support of 3D graphics at modern level, and also the possibility to use the 3D models created in popular programs for their creation.

Degree and quality of visualization in program applications can be rather difficult and realistic. When developing the network technologies, allowing creating complex trainers and simulators on the basis of which it is possible to train at once several experts.

Many professional skills demand elaboration before application in practice. And as a rule, training machines are used for this purpose. However, creation of simulators on the basis of these or those real objects can cost rather high, whereas trusting young specialists' management of the operating equipment – is the action very risky. Virtual simulators are actively applied in the modern world to allow such experts to fulfil the professional skills.

Virtual simulators are not inferior to ordinary simulators. However, they allow fulfilling these or those professional skills without various risks and big expenses. Various modern multimedia technologies, technologies of a virtual environment and the 3D schedule that allows feigning with the greatest efficiency conditions and laws of real life in virtual reality are actively applied.

Interactive simulators give the chance to train and develop these or those special skills. Such exercise machines can represent an appendix for the computer with a standard configuration, and the whole complexes of the software demanding existence of powerful computers and other special equipment.

Training on simulators happens in an automatic mode, so that the trainee can be trained independently, without assistance. At interaction with the computer simulator, various instructions in the form of the usual text, sound or video of records are transferred to the trainee. Application of the virtual 3D teachers allocated with artificial intelligence and helping most comfortably to be trained is in some cases possible.

Modern technologies allow imitating the real reality by means of the various multimedia devices involving hearing, sight, sense of smell and other feelings [1]. Immersion in virtual reality can be made by means of absolutely various devices. Systems of virtual reality are actively used absolutely in various branches. Such systems are actively applied in creation of various simulators and even to carrying out virtual laboratory works.

Virtual laboratory works have a set of advantages against the real ones: they are absolutely safe; their application requires only technical base, and it isn't necessary to spend any other resources; users can perform independently, without the assistance of the teacher, using the instructions received by means of the software. Computer technologies allow reproducing both simple and absolutely not imaginable experiments in the virtual environment. Thanks to modern graphic 3D applications and technologies of a virtual environment it is possible to simulate practically any conditions, interfaces and situations.

The functional simulator is a type of the simulators, allowing developing and improving of professional skills on use of the equipment and the interfaces which are carrying out these or those functions on management. Such simulators, as well as usual ones, are developed on the basis of the standard computer equipment and the software. However, use of interactive 3D graphics which allows reproducing these or those real elements and objects in the virtual environment is also possible. Thanks to technologies of a virtual environment the increase in realness is possible when using the functional simulator. Thus, experts can be added by trainees of bigger effect at elaborating of the professional skills on simulators.

Procedural simulators – allow fulfilling professional skills on carrying out these or those procedures. Such simulators are very favourable in use as allow not to risk in the course of the training, any real resources. Realness and immersion degree when training is rather high therefore such method of training has high efficiency. For achievement of realness graphic 3D applications and technologies of virtual reality are used. For interaction with virtual objects devices with the return, allowing stimulating physical interaction with virtual reality can be used. Scopes of procedural simulators are rather wide.

Not infrequently procedural simulators are used also for carrying out interactive training [2]. Interactive training is the method of training which is based on a program and technical complex. The main feature and advantage of such method is that the user can independently pass training, revise and check the knowledge by means of computer tests. Except that interactive training as a rule is much more economic than the classical because the user can use this or that educational program complex on the basis of own computer equipment, presence of the teacher thus also it isn't obligatory. The special role when developing programs for carrying out interactive training is played by the modern multimedia technologies, allowing making it more fascinating and interesting. It is especially important when it is a question of training of young people who most often show not a great interest to training. Interactive methods of training allow training to these or those skills with big degree of efficiency. Thanks to modern multimedia technologies, such methods can be used within interactive computer training programs. Such software solutions allow making training more clear and interesting that in turn yields very positive result. At an application creation for interactive training can be used both standard multimedia 3D applications, and difficult – such as 3D graphics.

Rather popular version of application of technologies of interactive training is game training [3]. Game training is a method which allows training this or that special skill, in the course of interaction with computer interactive game. The main advantage of such method is that it allows reaching positive result with the smallest efforts, thanks to its attractive form. Besides, the user can be trained in such form independently, without assistance.

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ТРЕНАЖЕРИ В УЧБОВОМУ ПРОЦЕСІ

У статті описано віртуальні тренажери в учбовому процесі. Розглянуто їх використання у віртуальній лабораторії.

Ключові слова: тренажер, учбові системи, візуальний тренажер, віртуальний тренажер, віртуальна лабораторія.

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НАПІВМАРКОВСЬКІ ПРОЦЕСИ ПРИЙНЯТТЯ РІШЕНЬ З РАНДОМІЗОВАНИМ ДИСКОНТОМ

У роботі розглянуто керовані напівмарковські процеси з випадковим дисконтуючим фактором. Знаходяться достатні умови існування та єдиності оптимальної стаціонарної нерандомізованої стратегії керування зазначеними процесами на скінченному та нескінченному горизонті.

Ключові слова: процеси прийняття рішень, напівмарковські процеси, рандомізований дисконт, рівняння оптимальності.

Вступ

Чимало наукових робіт присвячено вивченню випадкових керованих процесів з дисконтованим критерієм. Вибір критерію пояснюють, в основному, його можливим застосуванням в економічних задачах. Дисконт розуміють як величину, обернену до відсоткової ставки (рівня інфляції тощо). Однак навіть неглибокий аналіз показує, що ці економічні показники не є сталими в часі (рис. 1–3).

Питання зміни дисконту в часі розглядалося в роботах [1; 4; 6]. У даній роботі досліджуються напівмарковські процеси прийняття рішень з випадковим дисконтуючим множником. Досі такі процеси не розглядалися. Автори узагальнюють результати, отримані в [3] для марковських процесів прийняття рішень з рандомізованим дисконтом.

Постановка задачі

Розглянемо напівмарковський процес прийняття рішень для випадку, коли дисконт-фактор $\beta = (1+r)^{-1}$ є випадковою величиною (r – відсоткова ставка). Даний випадок є узагальненням керованого марковського процесу з рандомізованим дисконтом [3]. Подамо дисконт-фактор у вигляді $e^{-\alpha} = (1+r)^{-1}$, звідки $\alpha = \ln(1+r)$.