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DIGITAL TECHNOLOGIES FOR SUPPORTING THE TRAINING PROCESS IN TENNIS

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Abstract. This study presents a digital technology for supporting the training process in tennis. It is a broad category encompassing methods of athlete preparation, including physical, tactical, and technical aspects, which are improved through digital technologies. Special attention is given to motion analysis and biomechanics, tracking and performance monitoring systems, virtual and augmented reality (VR and AR) technologies, the use of artificial intelligence and machine learning, wearable devices for physiological monitoring. The paper also provides a review of the literature on the topic of using digital technologies in the training process in tennis.

Key words: digital technology, electronic tools, training control in tennis.

ЦИФРОВЫЕ ТЕХНОЛОГИИ В ОБЕСПЕЧЕНИИ ТРЕНИРОВОЧНОГО ПРОЦЕССА В БОЛЬШОМ ТЕННИСЕ

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Аннотация. В данном исследовании представлены цифровые технологии, используемые в поддержке тренировочного процесса в теннисе. Это широкая категория, охватывающая методы подготовки спортсменов, включая физические, тактические и технические аспекты, которые совершенствуются с помощью цифровых технологий. Особое внимание уделяется анализу движения и биомеханике, системам отслеживания и контроля производительности, технологиям виртуальной и дополненной реальности (VR и AR), использованию искусственного интеллекта и машинного обучения, носимым устройствам для мониторинга физиологического состояния спортсменов. Также представлен обзор литературы по теме использования цифровых технологий в тренировочном процессе по теннису.

Ключевые слова: цифровые технологии, электронные средства, тренерский контроль в тенисе.

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The training process for tennis players is a broad category encompassing methods of athlete preparation, including physical, tactical, and technical aspects, which are improved through digital technologies. Digital technologies have become a critical part of training in tennis, helping coaches and athletes enhance performance, monitor progress, and reduce injuries. Among the most relevant digital technologies are the following:

– motion analysis and biomechanics;
– tracking and performance monitoring systems;
– virtual and augmented reality (VR and AR) technologies;
– the use of artificial intelligence and machine learning;
– wearable devices for physiological monitoring.

Using high-speed cameras and sensors allows for a detailed analysis of player technique. In tennis, this can be particularly useful for optimizing movements in serves, forehands, and backhands. These data help correct technical errors, improve injury resistance by identifying excessive strain, develop individual

strategies, and adjust technique. In [1, 2] many examples of video analysis applications.

Systems such as Hawk-Eye use cameras and AI to track the ball's trajectory and player movements. This is used to analyze the ball's speed and trajectory, athlete positioning, movements, and player reaction to the opponent's actions. Sections of the book [3] dedicated to tracking systems in tennis.

VR/AR training allows for simulating game situations, training reactions, and developing strategic skills. In tennis, it enables players to virtually practice complex game situations, improve their response to opponents' shots and anticipation, and develop strategies against specific opponents. The book [4] includes include a recent study on the application of VR/AR in sports training

AI algorithms can analyze data from previous matches to suggest strategies based on the opponent's actions and the athlete's own playing style. AI applications help coaches plan training considering the player's weaknesses, analyze the style and tactics of opponents, and optimize workload and recovery. In a book [5] provides comprehensive guide to using AI for sports data analysis)].

Tennis players increasingly use smartwatches, wristbands, and special sensors to monitor heart rate and oxygen levels, track physical exertion and fatigue, and recover after intensive training A book [6] analyzing the use of wearable devices in sports science.

Digital technologies used to analyze and optimize the training process in tennis constitute a more focused area, concentrating on specific digital tools and methods: tracking systems, video monitoring, biomechanical analysis, software for data analysis, as well as VR/AR technologies. These technologies are already significantly transforming tennis training, making it more precise, effective, and safe.

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EXPERIMENTAL STUDY ON THE POSSIBLE EFFECTS OF MOBILE PHONE BACKGROUND LIGHT ON HUMAN BODY

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Abstract. Long-term use of mobile phones may lead to health risks. This study tests the background light of mobile phone screens. Based on the experimental results, the author makes preliminary calculations, analyses and evaluations on the blue light hazards and insomnia problems that mobile phones may cause, and gives relevant suggestions.
Key words: mobile phone background light, brightness, spectrum, blue light hazards.

ЭКСПЕРИМЕНТАЛЬНОЕ ИССЛЕДОВАНИЕ ВОЗМОЖНОГО ВОЗДЕЙСТВИЯ ФОНОВОГО СВЕТА МОБИЛЬНОГО ТЕЛЕФОНА НА ОРГАНИЗМ ЧЕЛОВЕКА

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Аннотация. Длительное использование мобильных телефонов может привести к рискам для здоровья. В этом исследовании проверяется фоновый свет экранов мобильных телефонов. На основе экспериментальных результатов автор делает предварительные расчеты, анализы и оценки опасностей синего света и проблем с бессонницей, которые могут вызывать мобильные телефоны, и дает соответствующие предложения.
Ключевые слова: фоновый свет мобильного телефона, яркость, спектр, опасность синего света.

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Electronic display devices (electronic watches, smart phones, computers, televisions, screens, etc.) have become a part of human social life. While transmitting information, they also have an impact on people's physiology and psychology.

As a prelude to this article, the author conducted a questionnaire survey on people of all ages from various countries, and one of the main conclusions was that mobile phones are currently the electronic device with the longest use time and the most frequent use.