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.

Table 1 – Brightness test results

Background Light	Brightness, cd/m^2
Red	24,32
Orange	104,28
Yellow	132,28
Green	61,35
Blue	61,84
Indigo	10,33
Purple	62,05
White	166,10

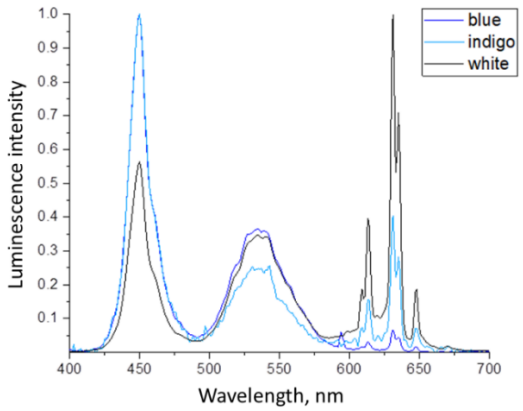

Figure – Relative spectral distribution of smartphone screen radiation: blue, indigo and white

Although studies have pointed out the potential health risks of prolonged mobile phone use [1–3], public awareness of this issue is still insufficient. Many people develop the habit of using their mobile phones in bed at night due to their busy work schedule during the day. This behavior pattern may lead to difficulty falling asleep, disruption of the biological clock, and may accelerate vision loss due to exposure to blue light emitted by the screen.

Based on this, the author conducted a systematic test on the background light of mobile phone screens and measured the brightness and spectral distribution of 8 colors of background light. The experiment was conducted in a dark room, simulating the use of mobile phones in a dark room at night. According to the formula provided by IEC 62471 [4], the blue light hazards that may be caused by the background light of mobile phones were calculated and analyzed, and conclusions were drawn and corresponding suggestions were given.

The test results of brightness are shown in Table, and the relative spectral distributions of three (8 in total) types of mobile phone background lights are shown in Figure.

To prevent photochemical damage to the retina exposed to blue light for long periods of time, the spectral radiance energy of the light source and the blue hazard weighted function B(λ), i. e. the blue light weighted luminance L_B, should not exceed 10^6 J/(m^2·sr)(t ≤ 10^4 s) or 100 W/(m^2 · sr) (t > 10^4 s). The formulas are as follows:

$$L_B \cdot t = \sum_{300}^{700} \sum_{t} L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta\lambda \leq \leq 10^6 J \cdot m^{-2} \cdot sr^{-1} (t \leq 10^4 s), \quad (1)$$

$$L_B = \sum_{300}^{700} \sum_{t} L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq \leq 100 W \cdot m^{-2} \cdot sr^{-1} (t > 10^4 s), \quad (2)$$

where the blue light hazard weighted curve B(λ) adopts the data given in GB/T 20145-2006 [5], and its peak wavelength is at 437 nm.

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