MODERN TRENDS OF MOTION PHOTOGRAPHY

Abstract. The article is dedicated to current trends in motion photography and their development directions. The study aims to showcase modern trends in motion photography and their evolution in the context of contemporary technologies. General scientific methods of cognition were employed in the research: analysis, synthesis, comparison, and generalization. The research results indicate that modern motion photography requires photographers to possess not only skill but also a deep understanding of technical parameters. Key challenges include the precise use of shutter speed to achieve desired effects, ISO control for optimal light balance, and the use of professional equipment such as high-aperture lenses and stabilizers. It is shown that high demands on equipment and environment, especially in studio settings, add complexity to creating quality motion photographs. The study reveals that modern technologies allow photographers to use a wide range of methods to capture motion, including high-speed shutters, burst shooting, and interactive approaches that engage models in active interaction. This enables the creation of dynamic images with high detail and emotional expression. It is demonstrated that the years 2023-2024 have brought new trends in motion photography, including minimalist color schemes and the use of 360-degree shots and virtual reality. This expands photographers' capabilities in creating unique, engaging visual experiences that make viewers feel as if they are part of the scene. The research also shows that the integration of advanced technologies such as artificial intelligence, drones, and virtual production predicts significant changes in the ways motion photography is created and utilized. These innovations not only enhance the functional and creative aspects of the medium but also open new possibilities for creating realistic and dynamic images accessible to both professionals and amateurs. The practical significance of the study lies in identifying the main directions for the development and use of modern technologies in motion photography, which can be useful for professional photographers and amateurs.

Keywords: motion photography, modern trends, technical parameters, high-speed shutter, virtual reality.
Introduction. Photography as an art form constantly evolves, highlighting new trends and cultural shifts that influence visual expression. From classic portraiture to modern abstractions and dynamic images, photography remains a vibrant canvas that reflects time and space. The introduction of new technical tools and technologies significantly expands photographers' abilities to create unique and recognizable works, enhancing the impact of art on society. The development of photography has traditionally been driven by the introduction of the latest technological solutions. From analog cameras to digital images, each stage of technological progress brings changes to the methods of shooting and image processing. The modern era of digital technologies, with its speed, flexibility, and accessibility, makes photography not only an art but also a powerful means of communication. Today's trends in photography focus on using high-tech equipment that allows capturing motion with unmatched precision and visual depth. The use of drones, high-speed cameras, motion capture technologies, and even artificial intelligence opens new possibilities for creating photographs that immerse viewers in entirely different worlds and realities. The future perspective promises radical changes, where specialized photo equipment might be replaced by a single universal device integrating artificial intelligence. This will not only simplify the shooting process but also make photographic technologies accessible to a wider range of users, providing them with tools for creativity at the highest level. This research is of a review nature and aims to show the direction in which photography will develop in the coming years, emphasizing the potential of AI and other advanced technologies.

Analysis of the latest research and publications. The topic of modern trends in motion photography is not sufficiently covered in scientific literature. Therefore, the research utilizes expert studies, photographer blogs, and professional magazine articles. Significant contributions to the topic have been made by T. Bol [1], who analyzes three types of motion in photography in his study. He emphasizes the importance of distinguishing between static objects and moving elements in the frame. Similar topics are discussed in the work of W. Isaac [4], where the author provides practical tips and tricks for freezing motion in photography, highlighting the importance of shutter speed. R. Leach [5] provides a comprehensive guide on freezing motion in photography, examining technical aspects and innovative approaches. His work is an important resource for those looking to expand their knowledge in this field. The study by C. Slazinik [10] is also significant, as it provides clear instructions on techniques for freezing motion in photography. Expert literature used for the research includes publications in modern online editions that cover contemporary aspects of the topic, such as Stutterburg, Tom Bol Photo, Orah, Click it up a notch, and others. Despite the sufficient amount of expert literature on this topic, there is a lack of systematic material on modern trends in motion photography. Therefore, using various scientific cognition methods, the information was analyzed, grouped, systematized, and presented in the light of the research topic.

The aim of the article is to showcase modern trends in motion photography and their development directions. To achieve this aim, the current study will highlight
the issue of creating various types of motion photographs, the technical features of creating trendy motion shots, the trends of 2023-2024, and the directions for the development of this photography using modern technologies.

**Results.** In the world of classical motion photography, creating a static image that conveys movement is achieved in various ways using different techniques and approaches. Research into modern photographers' blogs (Sport in Art, Wilkerson S., Slaznik C., etc.) shows that four main techniques are used, each with its own characteristics, applications, and shooting challenges. These techniques rely on different methods to depict movement in a static image.

1) **panoramic blur:** this technique involves moving the camera along with the moving object to keep it sharp against a blurred background. This creates a sense of speed and dynamism.
2) **motion blur:** this technique allows all elements of the image to blur slightly using a slow shutter speed, creating dynamic energy and a dreamy look, suitable for abstractions and expressing movement.
3) **image freezing:** capturing a moment in motion with a high shutter speed allows details of the action to be seen, which are usually imperceptible, conveying a sense of subsequent events after the scene "pause."
4) **visual flow:** smoothly guiding the viewer's gaze through visual composition using lines, repeating elements, and gradual gradients, which create dynamism and a sense of movement in a static image [1;12].

Each of these motion photography techniques has its own unique characteristics and challenges. Based on the analysis of contemporary literature describing approaches to creating motion photographs, these techniques can be described in Table 1.

<table>
<thead>
<tr>
<th>Characteristics and challenges of different types of motion photography</th>
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<tr>
<td><strong>Type of photography</strong></td>
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<tr>
<td>Panoramic blur</td>
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<tr>
<td>Motion blur</td>
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<tr>
<td>Frozen motion</td>
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<td>Visual flow</td>
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Note: systematized by the author [1; 5; 12]
Each type of photography allows conveying different accents needed for various fields. However, such creativity requires photographers to have a deep understanding of technical parameters and to solve several problematic issues.

- **Technical features.** The main difficulty lies in accurately capturing motion in dynamic conditions. The shutter speed must be high enough to freeze the moment or low enough to create a blur effect that shows movement. Shutter priority mode allows photographers to focus on controlling shutter speed, while other parameters (aperture, ISO) are adjusted automatically. Manual mode provides full control over all shooting parameters, which is critical in complex lighting or motion conditions [5].

- **Necessity of professional equipment.** To achieve high-quality motion shots, photographers use professional cameras and specialized equipment. High-aperture lenses and high ISO sensitivity allow shooting in low-light conditions while maintaining image quality. Panning, which involves moving the camera along with the object, requires precision and practice to achieve clear results. Using a flash can help freeze motion, especially in dark conditions [4; 5].

- **Professional environment.** Specialized equipment is particularly necessary for professional studio photography, such as in advertising, where it is essential to precisely control all aspects of the image. Additional devices, such as stabilizers, tripods, special filters, and lighting equipment, are used to achieve desired visual effects and ensure uniformity and light quality [4].

Modern motion photography has undergone significant changes due to technological innovations and continues to evolve. The main practice of creating motion photos in recent years includes using high-speed shutters, increasing ISO, creative lighting methods, burst shooting, and interactive approaches.

Let's examine each of these approaches.

**Using high-speed shutters.** Using a high-speed shutter is one of the key methods for freezing motion in photography. High-speed shutters allow capturing even the fastest movements, such as jumps, running, or other dynamic actions. It is generally recommended to set the shutter speed at 1/400 second or higher to achieve clear images [10]. For instance, when shooting active children or sports events, a shutter speed of 1/1250 second is optimal.

**Increasing ISO.** To ensure sufficient light when using a high-speed shutter, it is often necessary to increase the ISO. Increasing ISO boosts the camera sensor's sensitivity to light, which is important when shooting in low-light conditions. For example, when shooting indoors, ISO can reach 2000, allowing for high-quality images while capturing motion [10]. Although high ISO values can lead to noise, modern image processing methods help minimize these defects.

**Creative lighting methods.** Lighting plays a crucial role in capturing motion photographs. Using flashes and strobes helps capture moments with high clarity. Additionally, natural elements like wind or water can add dynamism and energy to the photograph. For example, using a flash can significantly improve image quality in low-light conditions, allowing for freezing fast movements [2].
Using burst shooting. Burst shooting allows photographers to take multiple frames in a short period, increasing the chances of capturing the perfect moment. This is especially useful when shooting sports events or active children. High frame rate shooting enables selecting the best moment from a series of images, increasing the likelihood of obtaining clear and dynamic photographs [2]. Interactive approaches. Engaging models in active interaction during the shoot can improve the final result. Interactive shooting methods, which involve models in active interaction, create natural and energetic images. For example, if a model is jumping, running, or throwing objects, it adds naturalness and energy to the images [10].

Using natural elements. Natural elements like wind, water, or dust can add additional dynamism and energy to the photograph. For instance, photographing children throwing sand on a beach can create a captivating motion freeze effect that highlights the scene's dynamism [10].

Thus, modern trends in motion photography open new opportunities for creating dynamic and realistic images. Using high-speed shutters, increasing ISO, creative lighting methods, burst shooting, and interactive approaches allow photographers to achieve high image quality in various conditions. These approaches not only push the boundaries of what is possible but also open new horizons for the development of visual arts and digital technologies. Examining the trends in motion photography for 2023-2024, several features characteristic of this time can be highlighted (Table 2).

<table>
<thead>
<tr>
<th>Trend</th>
<th>Description</th>
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<tr>
<td>Minimalistic color schemes [3]</td>
<td>Due to the high demand for visual appeal, minimalistic color schemes are</td>
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<td>becoming popular, along with neon, which adds brightness and recognizability</td>
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<td></td>
<td>to images.</td>
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<tr>
<td>360-degree photography and virtual reality [8]</td>
<td>360-degree photography and virtual reality technologies enhance the</td>
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<td>representation of ordinary scenes in an intriguing way, engaging users to</td>
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<td>experience scenes as if they were actually in them.</td>
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<tr>
<td>Mixing 2D and 3D [3; 8]</td>
<td>The use of combinations of 2D and 3D animations has become popular, allowing</td>
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<td>the creation of unique visual effects.</td>
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<td>Anti-gravity and floating effects [3]</td>
<td>Using objects that appear to be floating in three-dimensional space creates</td>
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<td>the impression of zero gravity and ensures immersion in the content.</td>
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Note: systematized by the author [3; 8]

Studying the prospective directions of development for the coming decade, it becomes clear that photography will soon undergo a fundamental transformation, integrating advanced artificial intelligence (AI) technologies that will enhance both the functional and creative aspects of the medium. Key innovations include the use
of drones, deepfake technologies, AI combined with motion capture (mocap), virtual production, and the integration of motion capture into the metaverse [9].

**Use of drones.** Drones have evolved from simple remotely controlled flying devices into autonomous vehicles that can move both above and below ground. These devices are widely used for high-precision operations [6]. Drones can capture high-quality photos from hard-to-reach places, including aerial shots and detailed ground images, creating unique and informative visual materials. Macro photography, especially in nature and small object niches, is a significant focus. Additionally, with technological advancements, drones are increasingly used for creating unique aerial shots [8].

**Deepfake technology.** Although often associated with "motion capture," deepfake technology is actually a separate machine learning tool. It enables the creation of realistic visual effects, integrating with motion capture technologies. In the film industry, deepfake is already used for rejuvenating actors or recreating the images of deceased artists, significantly enriching cinematic possibilities [6]. Photos created using deepfake are extraordinarily realistic and dynamic, allowing precise reproduction of people's features and movements.

**Artificial intelligence and motion capture in medicine.** Combining motion capture technologies with AI algorithms allows for the study of precise movement characteristics. This is actively used in medicine for researching movement disorders, such as dementia, muscular dystrophy, stroke, and Parkinson's disease. It allows the creation of digital "twins" of patients, used for data analysis and tracking rehabilitation progress [6].

**Virtual production of motion photography.** In recent years, the “LED volumetric” technology has been actively developed, allowing actors in motion capture suits to move to any imaginary location using large screens. This enables real-time scene creation against highly detailed computer graphics backgrounds, significantly reducing logistical costs associated with photography creation [6].

**The technology “Synthesizing Moving People with 3D Control”** allows animating people from a single photograph, creating realistic moving images. Developed by researchers at UC Berkeley, it involves a two-step process: creating a full image of a person, including parts not visible in the original photo. The technology "fills in" the missing parts, creating a complete image. It uses 3D models of human poses to control movements in the image, allowing for the creation of videos where the person from the photograph moves realistically [7].

Thus, modern technological solutions in motion photography open new opportunities for creating realistic and dynamic images. Innovative technologies for capturing motion photography are quickly integrating into smartphones, giving users the ability to create dynamic and realistic images without special equipment. Thanks to advanced AI algorithms, new smartphone models will automatically recognize moving objects and optimize shooting parameters to ensure maximum clarity. This
will reduce blur and improve image quality even in challenging lighting conditions, significantly simplifying the shooting process for users [7].

High-speed shutters integrated into smartphones will allow freezing movements even in the most dynamic scenes. This will enable capturing clear frames during sports events, dances, or other active activities, making these devices extremely powerful tools for amateurs and professionals alike [10]. Enhanced ISO capabilities in new smartphone sensors will allow shooting in low-light conditions without significant quality loss, which will be particularly useful for night shooting or indoor photography [10].

These technological advancements in smartphones make them universal devices for motion photography, providing high-quality images without the need for additional equipment. The integration of innovative features, such as burst shooting and creative lighting methods, allows users to achieve professional results with minimal effort, expanding the possibilities in mobile photography [7; 10].

In the coming years, cameras are likely to do more than just capture moments; they will actively assist photographers, suggesting optimal settings, predicting spontaneous facial expressions or movements for perfect timing, and analyzing lighting conditions to recommend exposure adjustments [9].

Conclusions. Modern motion photography requires photographers to possess not only skill but also a deep understanding of technical parameters. Key challenges include the precise use of shutter speed to achieve desired effects, ISO control for optimal light balance, and the use of professional equipment such as high-aperture lenses and stabilizers. High demands on equipment and environment, especially in studio settings, add complexity to creating quality motion photographs. Modern technologies allow photographers to use a wide range of methods to capture motion, including high-speed shutters, burst shooting, and interactive approaches that engage models in active interaction. This enables the creation of dynamic images with high detail and emotional expression. The years 2023-2024 have brought new trends in motion photography, including minimalist color schemes and the use of 360-degree shots and virtual reality. This expands photographers' capabilities in creating unique, engaging visual experiences that make viewers feel as if they are part of the scene. The integration of advanced technologies, such as artificial intelligence, drones, and virtual production, forecasts significant changes in the ways motion photography is created and utilized. These innovations not only enhance the functional and creative aspects of the medium but also open new possibilities for creating realistic and dynamic images accessible to both professionals and amateurs.

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