

THE VISUAL-ANALYTICAL CAPABILITIES AND EFFECTIVENESS OF COMPUTER ANIMATION IN ENVIRONMENTAL JOURNALISM

Qurbonboyeva Nodira Yusuffjon qizi

Uzbekistan State University of World Languages, Independent Researcher

Abstract. This thesis analyzes the visual-analytical capabilities of computer animation in environmental journalism and its effectiveness in influencing audiences. Multimedia technologies, animated visualization, and digital communication tools are considered effective means of delivering complex environmental and statistical information to the public in an understandable, compelling, and scientifically grounded manner. The historical stages of the development of animation technologies and their integration with data journalism, as well as the prospects for their application in environmental education and mass media, are also examined.

Keywords: environmental journalism, computer animation, visual analytics, multimedia technologies, data journalism, environmental communication, visualization effectiveness, environmental education.

The rapid development of information and communication technologies has significantly expanded the capabilities of environmental journalism. In particular, multimedia technologies make it possible to communicate environmental issues to a broad audience in a simple, comprehensible, and visually compelling manner. Multimedia technologies are distinguished by their ability to integrate animated graphics, text, audio, video, photography, and interactive elements into a unified information system. As a result, explaining complex environmental processes, climate change, the loss of biodiversity, and changes in ecosystems through animation can produce more effective results than presenting dry statistical data alone.

Animation is a visual technology based on the sequential display of images to create the illusion of movement. When the number of frames exceeds 16 per second, the human eye perceives the images as continuous movement. For this reason, animation is currently considered one of the most effective methods of

visualizing complex scientific and analytical information in environmental journalism. Although the concepts of “animation” and “multiplication” are often used as synonyms, in scientific literature the term “animation” is derived from the Latin word “*anima*,” meaning “life” or “spirit,” and refers to the process of “bringing an image to life.” Modern animation does not merely depict movement; it also serves to communicate complex scientific ideas and indicators to audiences in a logically and emotionally comprehensible manner.

The history of animation development began with humanity’s aspiration to depict movement. Sequential representations of movement can be found in Egyptian wall paintings dating to approximately 2000 BCE. In the 10th–11th centuries, shadow theatre emerged in China. By the 19th century, the phenakistoscope created by Joseph Plateau, the photographic experiments of Eadweard Muybridge, and Émile Reynaud’s praxinoscope laid the technical foundations for modern animation. The invention of the cinematograph by the Lumiere brothers in 1895, followed by the creative work of Walt Disney in the early 20th century, including *Steamboat Willie* (1928), transformed animation into a means of mass communication.

The first experiments in animation in Japan began in 1913. The earliest animated films were created by individual artists who sought to study and synthesize the experiences of American and European animators while combining them with their own national traditions. These efforts eventually led to the development of the anime style, which later became famous worldwide. The term “anime” is an abbreviated form of the English word “animation.” Anime works produced in the 1920s were primarily screen adaptations of Chinese and Japanese folk tales and classical literary works, created in the traditional Japanese visual art style. While in many countries around the world animation was primarily intended for children, a significant proportion of anime produced in Japan was aimed at adolescents and adults. This particular feature contributed to its greater thematic depth and widespread international popularity.

The development of computer animation marked a new stage in the film industry. In 1977, the film *Star Wars*, directed by George Lucas, went down in history as one of the earliest films to make extensive use of computer animation technologies. The film brought about a fundamental transformation in the film industry in terms of the use of visual effects. In 1986, Pixar's *Luxo Jr.* was recognized as the world's first short animated film created using 3D technology. The project demonstrated the possibilities of three-dimensional computer graphics and provided a strong impetus for the development of modern animation. Another important milestone occurred in 1995, when Pixar released *Toy Story*, the first fully computer-animated feature film in history. The film not only ushered in a new era in the animation industry but also demonstrated the enormous potential of computer graphics and digital technologies in film and multimedia.

Today, these technologies are widely used in environmental journalism, scientific visualization, and multimedia communication to present complex environmental processes in an understandable and compelling manner. Large-scale environmental datasets (*Big Data*), annual temperature variations, carbon concentrations, and levels of environmental pollution are increasingly presented in the form of dynamic animated graphics, 3D models, and infographics.

In addition, GIS technologies, satellite imagery, virtual reality (VR), and augmented reality (AR) tools make it possible to transform glacier melting, desertification, deforestation, the depletion of water resources, and changes in biodiversity into real-time visual-analytical models. Such analytical visualization enables audiences to comprehend complex environmental statistics more easily and to gain a clearer understanding of the scale of environmental problems.

In particular, one of the most successful examples of the use of animation in environmental journalism can be observed in the work of NASA's Scientific Visualization Studio. This center visualizes processes such as the Earth's atmosphere, changes in global temperature, sea-level rise, the distribution of carbon dioxide in the atmosphere, and glacier melting through three-dimensional animations based on satellite data. These visual materials help present scientific

information in a form that is comprehensible not only to researchers but also to the general public. In particular, the Global Temperature Anomaly animation dynamically illustrates changes in the Earth's temperature from 1880 to the present, clearly demonstrating the global scale of climate change. The World Wide Fund for Nature (WWF) is also one of the international organizations that effectively uses animated infographics in environmental communication. Visual materials produced by WWF explain such environmental processes as the decline in biodiversity, the reduction of endangered animal populations, deforestation, and the increase in carbon footprints through animated graphics. This approach transforms complex statistical data into simple visual representations and thereby increases the communicative impact of environmental information.

Today, international media organizations are also employing animation technologies as an important tool of environmental journalism. For example, BBC Earth uses computer-generated imagery (CGI) in its documentaries devoted to nature and ecosystems to model natural processes that cannot be observed directly by the human eye. Similarly, National Geographic presents changes in the Amazon rainforest, glacier melting, and transformations in marine ecosystems over time through interactive maps and animated infographics on its online platforms. This enables audiences to understand the dynamics of environmental problems within a relatively short period of time.

In conclusion, computer animation in environmental journalism is not merely a decorative element but rather an innovative tool for visually and analytically processing complex scientific and statistical information and communicating it to the general public in an understandable and compelling form. In the Uzbek media environment, the broader use of animated visualization, elements of data journalism, 3D modeling, and interactive maps in the coverage of environmental issues can significantly enhance the effectiveness of developing environmental awareness, responsibility, and environmental culture within society.

References

1. Thomas, F., & Johnston, O. (1981). The Illusion of Life: Disney Animation. New York: Abbeville Press.
2. Chakraborty, N. & Basu, T. (2022). Green Journalism and Global Environment: A Statistical Analysis on the Impact of News Coverage in Environmental Issues. Global Media Journal, 20(58).
3. Catmull, E. (2014). Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration. New York: Random House.
4. Gray, J., Chambers, L., & Bounegru, L. (2012). The Data Journalism Handbook: How Journalists Can Use Data to Improve the News. O'Reilly Media.
5. <https://www.youtube.com/c/NASAScientificVisualizationStudio/videos>
6. <https://wwf.org/?global=show>
7. <https://www.bbcearth.com/?ref=xranks>
8. <https://www.nationalgeographic.com/>