

NEW TV GENERATION STANDARDS

RT

To mark RT's 20th anniversary, we reflect on how television technologies have influenced and continue to influence global companies like ours. Since our inception, we have actively explored cutting-edge technologies that help us find bold and candid answers to our audience's questions. We have tirelessly striven to expand the horizons of the news space by applying innovative interactive approaches in storytelling, while earning a reputation for consistently exceeding expectations in the process.

RT is founded on two key pillars: quality journalism and visualization. These aspects are closely interconnected: every image serves the story, and the story cannot exist without captivating visualization. It is by rigorously upholding these principles that we ensure that the quality of all our news material is always of the highest standard.

We use all the tools available to achieve our goal. For us, even a small or secondary story must be presented as a quality product.

But how did simple and often boring news turn into something more than just a person sitting behind a desk reading text from a sheet of paper? Today, we see a world where all areas of the media industry are intertwined. News today includes social media, messaging apps on mobile phones, educational platforms where viewers become direct participants in events, and even cinema in its purest form.

AT THE DAWN OF TELEVISION

News is one of the most popular formats on television. News programs appeared at the dawn of the media industry and gradually evolved, while entertainment programs have changed, gained, and lost popularity.

People watch the news because it tells them about important events. Without news, people would be in an informational vacuum. News is a reflection of reality. Reports about incidents and events will always evoke emotions and stir people.

In the modern world, technological development has made news more accessible. People can receive information about events in real time using various devices and platforms. This has contributed to the emergence of new formats for delivering news, such as live broadcasts, streams, video reports,

and podcasts.

News programs continue to evolve and adapt to changing conditions. They are becoming more interactive, allowing viewers to participate in discussions of events and share their opinions. In addition, news programs actively use social media to disseminate information and attract an audience.

Thus, the development of news programming has not stopped but is, rather, becoming more diverse and accessible to viewers. People have the opportunity to stay informed about important events and make well-considered decisions based on the information received.

For the past century, the format of television news has evolved, while remaining fundamentally unchanged. A studio room with good sound



Soviet TV news, 1957. The presenter sits in front of a chroma key displaying a graphic map.

insulation, a table with a microphone in the center – behind it sits the anchor. The first television news broadcasts began in 1951 with the development of analog broadcasting, generally in the same format used for radio programs.

With the expansion of television networks and the development of video equipment, studios with anchors began to be supplemented by on-scene footage. At first, these were recordings, and later – live broadcasts.

Different TV channels competed in creativity, striving to make their picture more appealing. Projectors like those in movie theaters began to be installed in studios to broadcast news stories.

Modern news studios are equipped with various innovations: bright and engaging designs with multi-screens, advanced equipment, powerful cameras, and satellite communication for live broadcasts. Such studios have become the new standard in the television news industry.

But what comes next? What is the next step in the evolution of this established format? How can we diversify and surprise the viewer in the second quarter of the 21st century? What new or adjacent solutions can be introduced into the news without changing its familiar format? Perhaps it is worth turning our attention to another popular and experienced industry – cinema!

LIGHTS, CAMERA, ACTION!

The process of filmmaking has always been complex and expensive. Films were often shot on-location, although sets built at movie studios also played an important

role. However, it is not just about location, but also the amount of resources involved. A large number of people may participate in a film shoot: camera operators, lighting technicians, makeup artists, costume designers, stunt performers, and many others.

Unlike film production, television shoots are usually smaller in scale. Television is aimed at a wide audience, so the main focus is on accessibility and content variety. Television studios often use simpler and more cost-effective production methods, such as multi-camera setups and chroma key for creating special effects.

Over time, some countries saw the emergence of paid cable television. Programs became more engaging and spectacular, but production remained limited. Channels primarily invested in so-called prime-time shows, which paid off through advertisers. As a rule, such programs aired in the evening, when most families were at home. This allowed advertisers to maximize their reach to their target audience.

Made-for-TV movies were less expensive than full-length theatrical films and attracted viewers who preferred to watch movies at home. In addition, they gave film studios an opportunity to experiment with new ideas and formats with less financial risk. Thus, the emergence of made-for-TV films became an important step in the development of the media industry, combining the best features of cinema and television. However, with the advancement of technology and the appearance of new formats such as streaming services, the boundaries between cinema and television are becoming

blurred. Television channels can now create content that rivals feature films in quality and scale. Film studios, in turn, are beginning to experiment with formats to attract more viewers.

As the home viewing format grew in popularity, so did expectations for the quality and ambition of the ideas and projects that filmmakers wanted to realize. Budgets became comparable to those of major theatrical films. In the competitive struggle for viewers, creators had to find new ways to reduce production costs without compromising quality.

Thus, the media industry is in a state of constant motion and transformation. It adapts to new technologies, changes in audience demands, and other factors. This development has been made possible thanks to the efforts and creativity of the people working in this field. Unlike cinema, television – or more precisely, news – is a live operation. Therefore, when broadcasting a “live” signal, it is always taken into account that any technology must work in real time.

Realistic special effects were actively used in cinema but creating them required extensive preparation and hundreds of hours of pre-calculation. News, weather forecasts, or sports broadcasts also used 3D graphics, but due to the limitations of real-time rendering performance, it remained fairly primitive.

THE OLE SWITCHEROO!

The newer the technology, the more difficult it is to manage and the more expensive it often turns out to be. Therefore, it is logical that cinema was the first to begin using the latest tools that made it possible to



Courtesy: arri.com



The Battle for the Reichstag. A project dedicated to Victory Day on RT Arabic.

shoot films not only on real physical sets, but also against a backdrop of artificial ones, drawn on a computer and displayed on large screens in real time.

This reduced production costs and allowed for a more creative approach to filming in computer-generated environments. The entire crew, including the actors, could see where they were and perform their roles more convincingly than against a green chroma key background. Real-time imaging technologies became well-established and turned into an additional tool for creating feature films and television series.

News television quickly picked up this idea and started using new technologies in producing special reports, while integrating the familiar news studio with an anchor on screen.

In this way, a reporter can create a news story by being directly “inside the action” and describe what is happening live on air, without even leaving the studio. For example, a reporter can talk about the fall of a meteorite 1,000 years ago, about taking part in battles during the Second World War, or about the presentation of a concept for a future space station, while clearly illustrating to viewers the technologies of the future.

News has changed forever. Directors

can now give free rein to their imagination when preparing a new report. Political events, such as parliamentary elections, can be presented as virtual spaces with numerous interactive elements: animated candidate profiles or graphs that clearly illustrate the essence of what is happening.

RT’s production complex houses seven news studios. Five of these are dedicated to specific channels that broadcast in English, Arabic, Spanish, French, and German. Each studio is fully equipped with everything necessary to go live at any time. The cameras are mounted on telescopic cranes and fitted with optical tracking systems for positioning augmented reality elements, both through LED panels and on chroma key screens.

Studio 6 is a multipurpose space designed for a variety of tasks and is primarily used for non-news programs, special broadcasts, and post-production. The advantage of Studio 6 is that it is fully programmable, with transformable screens that can move along the studio’s coordinate grid. This allows the set designer to quickly reconfigure the space to match the desired preset of the program.

CHALLENGES!

What are the advantages and disadvantages of working with real-

time 3D graphics?

The advantage is that the entire team working on the project has more time for preparation. Shooting content in real time implies that all virtual sets are prepared in such a way that, after filming, a fully finished result is obtained that requires no further adjustments.

A similar logic applies to television news, which is understandable, since news broadcasts are live, and the viewer always sees a finished result. However, there is a nuance – the preparatory work in the studios. In news studios, no one waits for you to prepare your graphic material. Every hour, regardless of anything other than the news itself, the anchor must be on camera and go on air. No artistic or technical specialist is allowed to interfere during the broadcast.

Therefore, it can be confidently stated that the most difficult preparation of high-quality, cinematic-level content takes place precisely in television news. Projects are developed within tight deadlines to match current news events. Technical specialists integrate the visuals into the real studio sets in the very short intervals between broadcasts, which run nonstop, 24/7.

Every project is a challenge for the team, which is why highly qualified specialists work in this field. The



Special live broadcast of the Bundestag election results. RT Deutsch (Studio 6)



RT Deutsch news studio



Augmented reality on RT International. Project: Victory Photo

integrate augmented reality into the studio by adjusting the lighting and color balance.

TECHNICAL TASKS

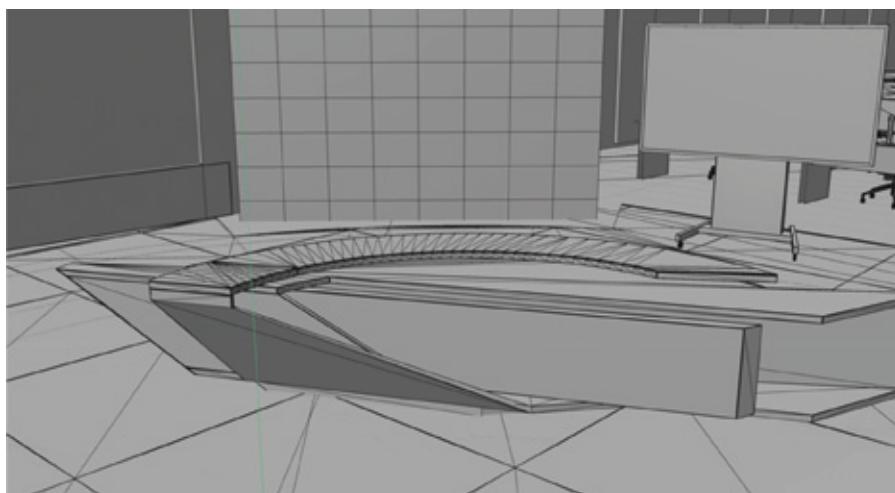
The artistic element is often subjective, unlike the technical or scientific component, which is more objective.

One of the key aspects of creating the correct perception of the final image is anchoring virtual objects to real physical locations. First and foremost, attention should be paid to setting up the tracking system properly and calibrating the camera lens accurately. It is also important to ensure that global coordinate systems are configured correctly.

production follows a clear, step-by-step process.

First, concept art is created. Then, computer graphics artists begin their work: they handle 3D modeling and develop visual effects. After that, the animators and programmers responsible for the event logic within the projects join the process.

The second part of the work is engineering: graphic elements are integrated into studios equipped with complex tracking systems. The camera's position in space, as well as data on zoom, focus, and even lens distortion, is transmitted to the graphics component by the system. The final stage is the work of compositing artists, who fully



3D reconstruction of the RT Español studio

As of today, the most effective solution is an optical tracking system with its own camera that reads reflective markers pre-attached to the studio ceiling. This system instantly scans the markers and transmits the spatial coordinates of the camera with virtually no delay.

If the tracking system is not configured correctly, virtual objects in the frame will either move ahead of or lag behind the image transmitted by the camera during motion. Incorrect lens distortion compensation settings will cause virtual objects to become distorted as the camera moves, and the images will drift apart relative to each other.

To create a cohesive perception and avoid distractions for the viewer, all images must be in perfect sync.

The second important aspect is the actual scale of the relative objects in the frame. Each virtual object must correspond to its proper scale and proportions. For example, if a 3D model of a car is prepared with

incorrect proportions and sizes – say, two-thirds of the real one – it will appear unnatural and toy-like in the frame. On a subconscious level, the viewer will sense that something is wrong. However, the goal of any visualization, even one for entertainment purposes, is to convey the story or deliver the information that it is supposed to illustrate.

To create virtual objects correctly, it is best to use LiDAR. This technology uses laser radiation to precisely measure distances to objects and their placement in space. Simply put, a laser rangefinder analyzes the environment by emitting laser pulses and registering their reflections. Scanning objects using this technology allows for millimeter-level precision.

FUTURE

Many people have already encountered artificial intelligence (AI), whether consciously or not. An average viewer might have seen generative graphics and been amazed by the bizarre shapes or

amusing videos created by AI.

In reality, the scope of AI application is much broader. Images on the internet are just the tip of the iceberg. As interest in augmented reality (AR) grows and the demand for cinematic quality in news increases, new AI tools are coming to the forefront.

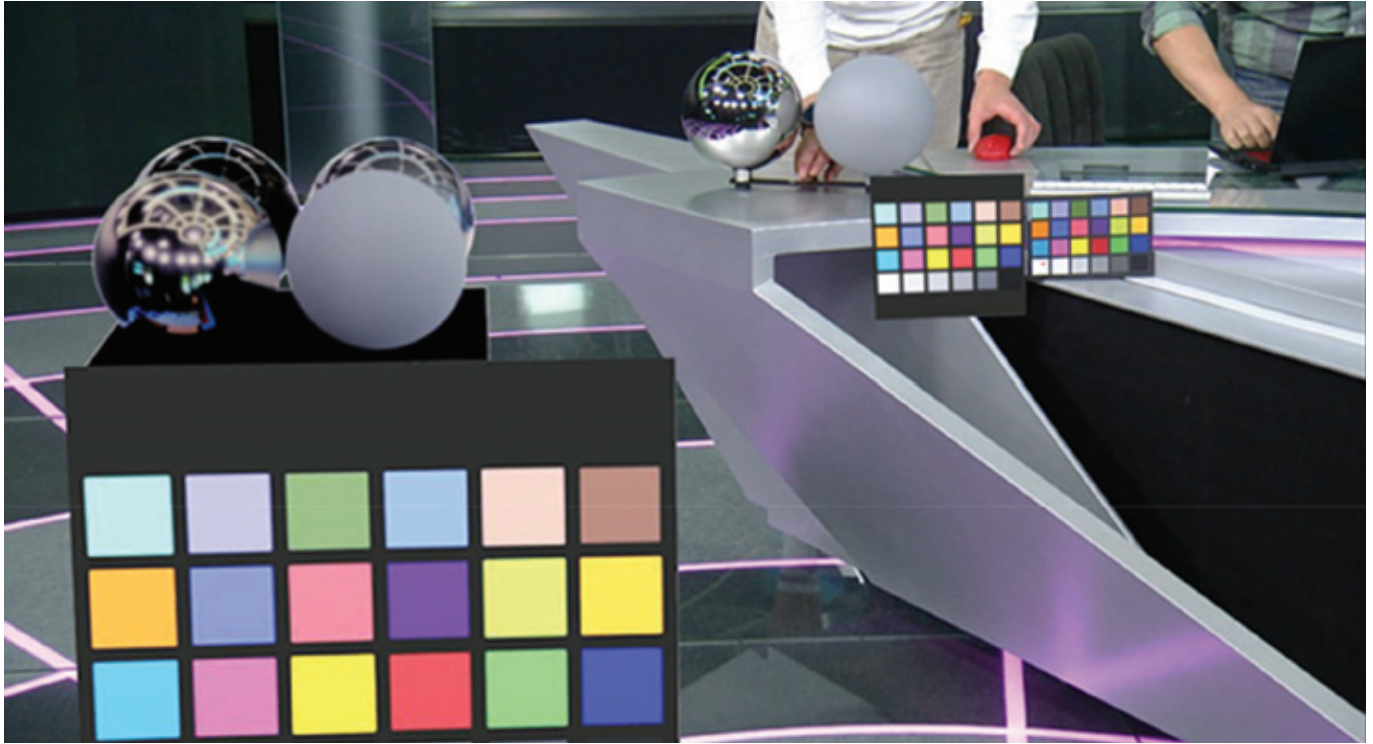
Many people don't even realize which elements they see on the screen are real and which are AI generated. For example, AI can reconstruct physical processes like light, reflections, and weather phenomena, as well as create fully generated sets. It can even replace on-screen anchors with virtual avatars.

Meanwhile, AI-powered data analysis is employed to understand which content attracts viewers the most. These days, it doesn't matter how content reaches the end user – through an internet browser, a messenger app, or a Smart TV. Data is collected across all platforms to determine how best to allocate resources and more effectively draw attention to one's own media service.

At RT, we place great importance on developing AI and maintaining control over it. For us, it is crucial that any information processed through AI is reliable.

The main directions for AI development in the future include harnessing its analytical capabilities and creative solutions, as well as its assistance in dealing with medical issues and natural disaster prevention and information.

Professionals working with special effects at the dawn of cinema and television already understood a simple truth: even the most complex tools are secondary when it comes to creating something extraordinary. What matters most is how artistically and creatively designers and programmers approach the realization of their own thoughts and ideas. What's important is how passionate a person is about their work. Any professional will tell you that the most valuable asset in an artist's work is experience and having



Color correction tools. The final stage of producing augmented reality for the studio



'Our Dialogue' program on RT Arabic. A combination of augmented reality and artificial intelligence. Generative sets.

ARTIFICIAL
INTELLIGENCE

AI AVATAR



Virtual presenter generated by artificial intelligence. Project: AI AVATAR.

a well-trained artistic vision. All technologies are merely tools to help achieve set goals. No AI can replace the passion for one's craft that comes from the heart.

That is why RT always supports and values its employees. In a large company, it is easy to lose the lightness and corporate spirit that unites people. However, we strive to ensure that our employees not only work together but also form

friendships, value family, and nurture their children.

It is important to pass knowledge on to future generations, to ensure that our children are proud of us and understand the important work we are doing. We are confident that our achievements will continue to grow, new ones will emerge, and all of them will be aimed at benefiting society and the entire world.

AUTHOR



Roman Nikitin is the Head of VFX & 3D Graphics Department at RT, the global multilingual TV news network. Roman leads the team in charge of the network's VFX, AI and Augmented Reality projects and manages the entire production pipeline, including the work of all of the VFX artists. He is responsible for all 3D Graphics elements produced for newscasts, programs and special projects alike. ■



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