RESEARCH ARTICLE

# ARTIFICIAL INTELLIGENCE TOOLS USED IN EDITING AND THE EDITING PROFESSION

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*This study complies with research and publication ethics.*

## Abstract

As a technological branch of art, film has historically collaborated with science to foster the development of new techniques. This collaboration has significantly influenced film production processes, especially the editing stage, which has continuously evolved with the introduction of advanced technologies. The trailer editing of director Luke Scott's 2016 movie Morgan, which would normally take 10-30 days, was completed in just one day with artificial intelligence technology used for the first time. Since then, artificial intelligence tools in film editing have changed the business practices of editors with automatic uses that reduce the tasks at hand. The aim of the study is to reveal how the profession of editing has transformed, perspectives on the future of the profession and professional concerns by explaining the editing practices that have changed with artificial intelligence through the experiences of Turkish editors. Artificial intelligence tools reduce the work time in the cinema and television sector and require the acquisition of different expertise. In the 2024 study, an in-depth interview was conducted with 11 editors with at least two years of experience in the broadcasting industry who made edits using different types of programs and different software, and the obtained data were categorized by descriptive analysis. Turkish editors indicated that artificial intelligence tools have facilitated their previously time-consuming and labour-demanding special effects, and that the works they did not do before are now included in their job descriptions. Although artificial intelligence creates a pessimistic perspective on the profession, the editors stated that the need for creative people will never end. This situation requires the editors to be good artificial intelligence users other than the editing program they use.

**Keywords:** artificial intelligence, editing, editing profession, editing software.

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ARAŞTIRMA MAKALESİ

# KURGU YAPIMINDA KULLANILAN YAPAY ZEKÂ ARAÇLARI VE KURGUCULUK MESLEĞİ

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*Bu çalışma araştırma ve yayın etiğine uygun olarak gerçekleştirilmiştir.*

## Öz

Teknolojiye dayalı bir sanat dalı olan sinema, tarih boyunca yeni tekniklerin gelişmesi için bilimle işbirliği yapmış film üretimi ve özellikle kurgu aşaması yeni teknolojilerin kullanılmasıyla değişip dönüşmüştür. Yönetmen Luke Scott'ın 2016 yapımı Morgan filminin normalde 10-30 gün sürebilecek fragman kurgusu ilk kez kullanılan yapay zeka teknolojisiyle yalnızca bir gün içinde tamamlanmıştır. O günden bugüne film kurgusunda yapay zekâ araçları, iş yükünü azaltan otomatik kullanımlarla kurgucuların çalışma pratiklerini değiştirmektedir. Araştırmanın amacı yapay zekâ ile değişen kurgu pratiklerini Türk kurgucuların deneyimleri üzerinden anlatarak kurguculuk mesleğinin ne şekilde dönüştüğünü, mesleğin geleceğine ilişkin bakış açılarını ve mesleki kaygıları ortaya çıkarmaktır. Yapay zekâ araçları sinema ve televizyon sektöründe iş süresini azaltmakta, farklı uzmanlıklar kazanmayı gerektirmektedir. 2024 yılında yapılan çalışmada sektörde en az iki yıllık deneyime sahip farklı program türlerinde ve farklı yazılımlar kullanarak kurgu yapan 11 kurgucuyla derinlemesine görüşme yapılmış elde edilen veriler betimsel analizle kategorilere ayrılmıştır. Türk kurgucular, yapay zekâ araçlarının uzun zaman alan ve uğraştıran efekt işlerini kolaylaştırdığını bununla birlikte daha önce yapmadıkları işlerin artık iş tanımına girdiğini belirtmişlerdir. Yapay zekâ, mesleğe ilişkin karamsar bakış açısı oluşturmakla birlikte kurgucular, yaratıcı insana gereksinimin asla bitmeyeceğini ifade etmiştir. Bu durum kurgucuların kullandıkları kurgu programı dışında iyi birer yapay zekâ kullanıcısı olmalarını zorunlu kılmaktadır.

**Anahtar Kelimeler:** yapay zekâ, kurgu yapımı, kurguculuk mesleği, kurgu yazılımları.

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**Introduction**

In the beginning, there was a pellicle for storytelling in cinema. The technology of cinema, a relatively young art, has changed rapidly over its nearly one hundred and thirty years of history. This study is on the profession of editing, which is highly affected by the dizzying transformation of cinema technology. As of 2024, the editors who physically cut the film through the pellicle are still alive, and at the point reached today, artificial intelligence tools will perhaps completely eliminate this profession.

The concept of artificial intelligence, which is generally defined as the ability of computer or computer-controlled robots to perform tasks related to intelligent beings, refers to the acquisition of human-specific abilities such as reasoning, making sense, generalizing or learning from past experiences to a computer or a machine in order to model human intelligence ("Artificial Intelligence", 2024; Yılmaz, 2023, p. 1). In other words, it is the technology of developing systems that are created by artificial means and can exhibit human-like actions without using any living organisms (Aydın & Değirmenci, 2018, p. 20). Artificial intelligence is a field of research that involves processes that are too complex to be defined by a clear algorithm, utilizes heuristic and automatic learning methods, and develops computer models perceptually and cognitively, such as the processes of recognizing and processing certain patterns (Sankur, 2002, p. 35).

The concept of artificial intelligence, which dates back hundreds of years as an idea, emerged with the question "can machines think?" by Alan Mathison Turing, who suggested in 1950 that computers could learn to behave like humans and that it would be possible for a human communicating remotely with a computer to mistake the machine talking to him for a human (Aydın & Değirmenci, 2018, pp. 20, 104-105).

The first artificial intelligence researchers focused on rule-based and logic-based approaches, reflecting the fundamental workings of computers. However, when these approaches did not work well in real life, algorithms based on probability calculations began to be used. Researchers in the 1980s, on the other hand, adopted a more experimental approach and act on the principle of thinking like a 'brain'. Artificial intelligence is designed in the form of successive layers in the form of neural networks similar to the human brain. The output of each layer is the input of the layer that follows it. Each layer sends signals to the next, resulting in the expected response from the output layer. Thanks to the "supervised learning" algorithm, which can take a dense amount of input-output pairs as inputs and calculate the wire weights of the neural network, the machine learns all these transformations by itself. Thanks to the backpropagation algorithm, which is activated when the artificial intelligence makes a mistake while working, the calculation-correction cycle is repeated thousands of times. Finally, the targeted learning takes place (Say, 2019, pp. 96-102).

Since artificial intelligence algorithms are trained by giving certain rules, they are challenged in situations that require flexible decisions. *DeepMind*, which was acquired by *Google* in 2014, realizes its deep learning model with its game-playing artificial intelligence algorithm. The neural networks trained in this model make the best move for the next stage by calculating the average number of points to be gained by pressing each allowed key and the return of the previous decision and examining the current position (Tegmark, 2017, p. 147).

Deep learning is related to the excess number of pattern networks in the algorithm. However, being able to train multilayered networks requires a long-lasting calculation. Gaming computers provide this. Artificial intelligence researchers believe that the neural networks of processors in gaming computers are well-suited for thousands of parallel weight calculations. They have also realized that these networks can be trained. A large amount of data to be calculated in the neural networks of computers comes from social media networks. Thanks to big data environments such as *Facebook* and *Google*, the neural networks of artificial intelligence are trained with huge data (Say, 2019, pp. 104-105).

Today, artificial intelligence is generally used to increase people's quality of life (Köroğlu, 2017, p. 4). The applications of artificial intelligence, which provides efficient technological services to assist people and simplify their lives, include engineering, medicine, education, marketing, art, architecture, industry, trade, tourism, agriculture, finance, law, and communication.

**Professional Editing Software and Artificial Intelligence Tools Used in Image Processing**

Today, the web technology defined as Web 3.0 works integrated with artificial intelligence, and digital communication and publishing are increasingly included in daily life. According to the data of the Turkish Statistical Institute (*Türkiye İstatistik Kurumu* [TÜİK]) in September 2023, the preferences are followed by social networks such as *Facebook, LinkedIn, Xing* at a rate of 89.1%, and popular video sharing sites such as *YouTube* and *Instagram* at a rate of 75.5% (Türkiye İstatistik Kurumu [TÜİK], 2023). Nowadays, more and more people are sharing their ideas, knowledge and their own story through online videos. Small documentaries, video essays, narrative videos such as how-to, educational content, product promotions are scripted and presented to the audience with the support of elements such as graphic music. Preparing these digital contents requires knowledge, skills and effort in terms of publishing. Artificial intelligence tools significantly facilitate the work of semi-professionals or professionals working in this field. Today, *OpenAI* and *Google* companies stand out in the studies in the field of artificial intelligence.

*Adobe Premiere Pro* is professional video editing and editing software de-

veloped and widely used by Adobe. The process of adapting *Premiere Pro* to artificial intelligence started with *Adobe Firefly*. The first of the productive artificial intelligence tools supported by *Firefly* is to mask the objects and areas in the moving image and replace it with another object or area by typing a prompt specifying the desired features. The artificial intelligence tool offers options according to the prompts entered, and the constructor allows it to settle by clicking on the most appropriate one. Another provided feature is the integration of artificial intelligence tools into those available in *Premiere Pro*. With AI smart masking tools, the desired objects are masked and removed, and the natural texture of the image takes its place. This feature is ideal for eliminating elements such as equipment, rigging or brand logos that should not be shown, which may accidentally enter the frame during shooting. In addition, if the image taken during shooting is shorter than the desired length to be used, artificial intelligence tools perform "productive extension" so that the clip does not disturb the reality. In this new release, *Adobe* incorporates AI tools such as *OpenAI, Runway* and *Pika*. In *Premiere Pro*, although it is currently in the trial phase, it is possible to produce B-roll images for any scene by entering the text command of the *Sora* model of *OpenAI*. Another artificial intelligence tool that *Premiere* includes is *Runway*'s text command video creation process. Considering ethical concerns, *Adobe* has created content credential boxes to label the image to make it transparent in which elements artificial intelligence processes are used in the editing process (*Adobe Video & Motion*, 2024).

*DaVinci Resolve* is a post-production software that allows editing, color editing, visual effects, and sound editing to take place within a single software. The latest versions of *DaVinci Resolve* include artificial intelligence and machine learning technology *Neural Engine AI* tools. The software uses advanced algorithms and deep neural networks for complex tasks such as face recognition and object detection. Therefore, it can analyze individual frames and interpolate new frames in slow motion to obtain more fluid and natural-looking videos. It also improves color grading and correction by automatically creating a mask around the faces it identifies (Tella, 2024).

In *DaVinci Resolve* software, audio can also be converted into written text and the cuts made over the text are reflected on the timeline, that is, they are instantly edited. With the effect in the software, applications such as separating the person or object in the foreground from the background or blurring the background can be made, it is possible to place another image layer in the clip that becomes layers and to eliminate some objects that exist in the shot. The Voice Isolation tool of the software, which has an artificial intelligence tool for classifying all the voices and people in the clips, removes the noise when there is background noise in the audio file and turns it into a clean sound (Stratvert, 2024).

**Editing-Editorship and Occupational Anxiety**

Editing is a fine workmanship that requires a lot of patience. In the first years of cinema, such a sensitive and dexterous job was left in the hands of women, and the first editors were women. Considering that the duration of an average film is 90 minutes, it can be thought that the editor only has to watch an average of 6 hours of footage with different angles and shooting repetitions. In a technology like *Moviolo*, where the film is physically cut and pasted again, one can imagine how laborious the editing job is. Therefore, it is not a coincidence that the digital transformation experienced by cinema in the 2000s started from editing. Despite the convenience of a technology provided by random access on real-time images on a computer, it would not be easy for editors to adapt to this technology. Cinematographer Ellen Kuras, one of the former editors, expresses the transition to digital as follows.

> One of the things that I find interesting is that since old editors like me, the digital world has evolved and become original, our control over images and our power of manipulation has increased, but in fact our power of control is less now because we have let go of the negatives and our machines. Now everyone can take these programs and play with images (Kenneally, 2012, 51:39).

The work done in the analogue editing technique, where the films are physically cut and combined, is a work that requires expertise and experience and is done by certain people. The devices used are expensive and have a technology that requires a special space. With the transition to digital format, large, expensive and limited-access devices are replaced by computer hardware. Now, a qualified computer and editing software are sufficient for editing. This increases the number of users, and being able to edit is no longer a job in the hands of certain people.

The basis of editing is to move from one plan to another by cutting. Sergey Eisenstein called the reconstruction of the basic editing, which is the ordering of plans in a horizontal sense to reach certain meanings, with the sound and music added to the image in the film Aleksandr Nevsky, "vertical editing". Eisenstein states that apart from the meaning structures formed by adding the images horizontally, it allows a layered reading with compositional arrangements within the frame (Eisenstein, 1984, p. 172).

According to Reid, filmic elements that have the potential to resist the linear arrangement defined by Eisenstein with vertical editing can be defined as simultaneous music, the actor's gesture and voice, the choices of the shooting frame, set, geometric composition, line, color (Reid, 2005, p. 62). The digitalization of cinema technology has paved the way for editors to perform tasks that require vertical processing such as writing, using effects, changing backgrounds, masking, in addition to the editor's decision-making work such as arranging plans, arranging their duration and number.

At the point reached today, artificial intelligence technology significantly changes the practice of editing. The ability to be an artisan in analog editing

has decreased with digital technology, and with artificial intelligence, the editor's time-consuming jobs are decreasing and even hints that they will disappear completely in the future. This significantly increases the professional concerns of the editors. Barış Tolga Ekinci conducted a study on the working conditions of Turkish editors in 2017[1]. In literature, there is no study on the transformation created by technological changes, especially artificial intelligence, in the workflows of editors.

**Purpose and Method of the Study**

The aim of the study is to reveal the reflection of rapidly changing and updated artificial intelligence tools on the workflow of the editors and their changing perspectives on the profession. In the study, answers to the following questions were sought:

1. How often and for what purposes are artificial intelligence tools used by editors?
2. How have AI tools changed the workflows of editors?
3. Do artificial intelligence tools create professional concerns in editors? Is there a risk that this profession will disappear in the future?

The population of the research consists of editors working in the Cinema and Television sector in Türkiye. In order for the research to comply with the high standards of publication ethics set by the Committee on Publication Ethics (COPE), the Ethics Committee of İstanbul Rumeli University was consulted. The ethics committee examined the CVs of the researchers, data collection tools and research questions, and unanimously decided on the ethical suitability of the research at the meeting numbered 2024/3 held on April 26, 2024.

In the study, which adopted a qualitative approach, 11 editors were reached by snowball sampling method and in-depth interviews were conducted. In the in-depth interview, the interviewers were asked the questions prepared by expanding the research questions. The obtained data was used to create the following categories, which were then analyzed using descriptive analysis method.

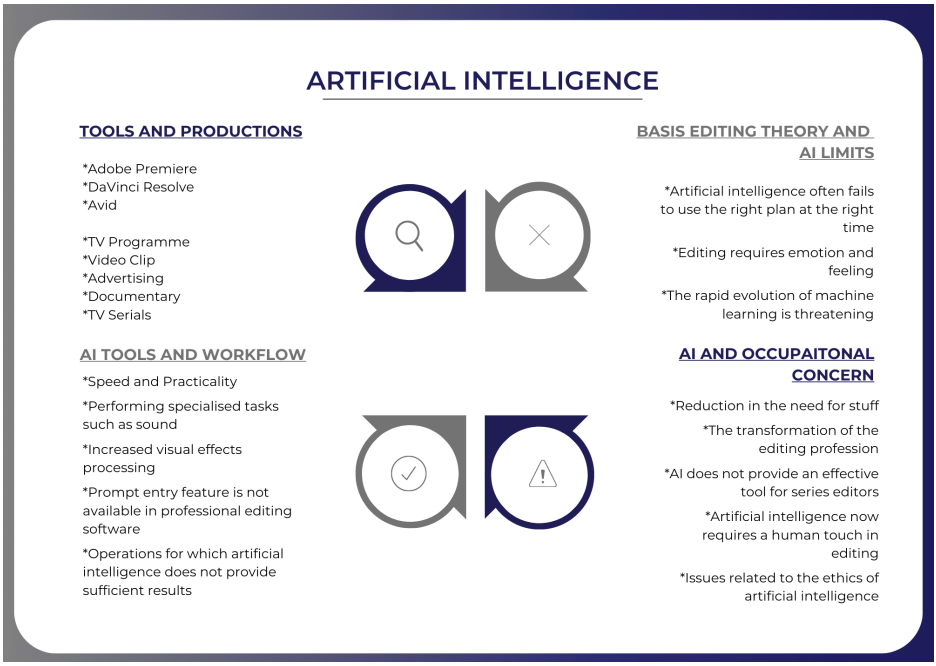
Editing Software Used and Edited Productions

1. Artificial Intelligence Tools and Editors' Workflows
2. Basic Editing Theory and the Limits of Artificial Intelligence Tools
3. Artificial Intelligence Tools and the Future of the Editing Profession -Professional Concerns

[1] Ekinci. B.T. (2017). Sinema ve televizyonda kurgucularin çalışma koşullari üzerine bir değerlendirme. *Eurasian Journal of Researches in Social and Economics*, 4(7) pp. 14-23.

## Findings

*Figure 1. Artificial intelligence (tools, workflow, boundaries, and occupational anxiety)*




### Editing software used and edited productions

The work experience of the editors participating in the study varies between 4-25 years and they edit in documentaries, TV programme, film, advertisement, series formats and use software such as *Adobe Premiere* and *DaVinci Resolve* and *Avid*. Artificial intelligence tools are used for purposes such as removing people and objects, subtitling, sound correction-improvement, multicam editing, that is, editing the image coming from many cameras at the same time, tracking the object on the color page, increasing the image quality, stabilizing the image, adding new light to the image, creating a non-background.

*Table 1. Interviewed editors and their experiences*

| Interviewed Editors | Year of Entry into the Profession | Areas of Employment | Editing Software They Use | Types of Programs They Edit |
|---|---|---|---|---|
| Deniz Salmanlı | 1999 - …. | Television | *Adobe Premiere Edius Avid Final Cut* | TV Program (Documentary, News) |

| | | | | |
|---|---|---|---|---|
| Cenk Kaptan | 2001 - …. | Agency | *DaVinci Resolve* | Documentary-weighted, all formats |
| Abdurrahman Seçer | 2004 - …. | Television Cinema Series | *Edius Final Cut Adobe Premiere* | TV Program (Documentary, Culture-Art) Series Motion picture |
| Kartal Uzun | 2004 - …. | Television | *Avid Final Cut Adobe Premiere Edius* | - TV Program (Documentary, Music) |
| Cantekin Cantez | 2004 - …. | Television | *Adobe Premiere Avid Velocity Pinnacle* | TV Program (Culture-Art, News) |
| Erdem Genç | 2004 - …. | Agency | *Edius Adobe Premiere Adobe Photoshop* | Advertising |
| Alaattin Abuçka | 2009 - …. | Television | *Edius Final Cut Adobe Premiere* | TV Program (Documentary, Music, News) |
| Mahmut Aran | 2009 - …. | Production Company | *Final Cut Avid* | Series Motion picture |
| Yakup Efe İnanlı | 2014 - …. | Production Company | *Final Cut Avid* | Series Motion Picture |
| Çağlar Barikan | 2020 - …. | Agency | *DaVinci Resolve* | Advertising Music Clips Promotional Videos - Activity Videos |
| Candan Karamanoğlu | 2020 - …. | Freelance | *DaVinci Resolve* | Video, Clip - Advertising |

**Artificial intelligence tools and editors' workflows**

Although the editors vary according to the work they do, they perform 20-

60%of the work using artificial intelligence and prefer artificial intelligence tools in terms of saving time and practicality. Previously, the work that took a long time and was seen as a chore is easily done thanks to these tools, for example, a six-hour editing is completed in 1.5-2 hours.

> Right now, you know, *Adobe* has started integrating artificial intelligence plugins. For example, you have shots multicam with 3 cameras, sometimes the player turns to the right or does not speak, there is listening, you throw it and leave it after matching the sound, it does the editing itself, sometimes it leaves the listening, it focuses only on the speaker, sometimes it gives the view of the listener when it speaks for a long time. With a very small touch, normally a 3-hour multicam 3 camera work, 3 hours of watching and rewind, you know, it has been watched for a minimum of 6 hours, the editing is over and it takes 9 hours. This is the output of the healthy editing. In this way, it already does the whole process on its own in 20 minutes. After you do it, you just watch it and it speeds the job up a lot (Erdem Genç).

> It speeds up the workflow a lot. Thanks to artificial intelligence, we can do many areas and many parameters that we would normally do by hand, much faster and much better quality. There is a tool called Magic Mask in *DaVinci Resolve*, you can easily select all kinds of objects or creatures in a 2D video, and because you make this choice, you can give many effects very easily (Cenk Kaptan).

The second point that the editors emphasize about the contributions of artificial intelligence tools is that they offer interesting effects that they did not think of before. The fact that they can now do the works they previously wanted to receive effective support shows that their workflows have changed. Although it is limited in terms of moving images, things that could not be done before or that are difficult to do today can be done in terms of creating animations from photographs, creating videos, and creating spaces that existed in the past. In particular, the tasks that require help from the sound engineer are now easily handled in the editing software.

> Of course, since I am not a sound engineer now, especially at the sound point, I was involuntarily or unwillingly applying for artificial intelligence support because I did not have a tonmaister level of knowledge. The fact that *DaVinci* embodies this within itself was one of the biggest attractions for me. Apart from that, there is now a lot of artificial intelligence support on the color page. Especially in the processes that we call tracking the object gives an incredible result. I can say, for example, that I can finish a setup that I can finish in 6 hours in 1.5 hours or 2 hours (Çağlar Barikan).

> Regarding sound, *DaVinci Resolve*'s 19th The version came with an incredible sound feature. When you give the music, *DaVinci* dedicates it to his instruments; that is, it dedicates his guitar, press, drum, vocal, and other effects to you separately. You can continue editing the music by making or remixing various effects on them. For example, these were not many years ago, not 20 years ago, but 1 year ago, it was like a dream (Cenk Kaptan).

According to the editors, their business plans will not focus on sequencing but on recreating them. This situation causes the editors to increase their anx-

iety as the idea of "working less diligently during the production phase of the work will be done in the editing anyway" is reinforced.

> Artificial intelligence will make it easier for us to do what we do, but it will give programmers a trump card, and our duties will increase a little more. They might say "I want this, I want that" which can increase our responsibilities a little more by saying that it should be this way or that way. Because even if they do not have a full idea about the incident, they can ask for things they do not have control over by saying that they have this with what they have heard. Here, we will have to master the business and understand what they mean (Alaattin Abuçka).

In frequently used artificial intelligence tools such as *Sora, Pika* and *Runway*, colors are changed with the commands given on the images by entering written information, that is, prompts, and completely different atmospheres are obtained and even images can be obtained from scratch.

> The editing software we currently use does not have the ability to enter prompts. As far as I understand, it will take another 5-10 years for this transformation to take place in a very good way. But professionally, there is still hope for people who will not use artificial intelligence or other software, but in general, after the 1910s (analog video tape editing), *AVID*s seemed like a big revolution, for example, now it seems like a bigger revolution, but what will happen in the future is more unknown (Kartal Uzun).

> It gives the events that correspond to the prompts in the form of shortcuts, headings, or subheadings in the attachments, and in return, I give an example of what it corresponds to us. For example, there is a feature we call "Blurring". It entered those prompts in the background for me. While I just take that attachment and show where the transaction is and mark it. It makes it easier for me to process the transaction it will do there with the help of what they write in the background with the help of the command in the background. However, I was going to do it by shaping the frame-by-frame time for a much longer time, but it can do these operations much faster on my behalf (Abdurrahman Seçer).

Although artificial intelligence tools make things easier, they have limitations with the current technology dimension. According to the editors, they still have to deal with jobs that require specific solutions that cannot be done automatically with the artificial intelligence tool. Artificial intelligence is not currently included in the workflows, especially for editors who make series or films.

> For example, *Premiere* has a "fill" feature. Which is covering or changing an area you do not like. But if I've only used it twenty times so far, it's worked for me three times. When the developers show it, they are actually showing the ideal. For example, it deletes a car that goes upright on the sand, but I am not trying to delete a car that goes on a flat sand; rather, I am trying to clear an area within a more complex region. When you look at it, artificial intelligence needs to be able to solve the most complex problem in order to progress. In its current form, it cannot solve the complex problem, in fact, it is confused. When I do it myself, I get a much more efficient result because the device does not do much because it accepts something as having-not having (Kartal Uzun).

(…) There is no need for artificial intelligence add-ons in series editing at the moment. I don't think it's a good fit for the show right now. Because I don't know what to do when I sit at the table. Where to start the stage, where to walk... So even if artificial intelligence edits itself, I don't think we can say that for the series right now (Mahmut Aran).

**Basic editing theory and the limits of artificial intelligence tools**

Basic editing theory is to cut a plan at the right point and connect it from the right point. According to Walter Murch, the ideal cut is suitable for the current emotion, although the rules are certain principles, the editor cuts the rhythm of the film by feeling his feeling, that is, emotions and intuitions come into play while editing. When Murch interrupts a character before his speech is completed, he states that the audience's words are superficial, that is, insignificant, and that when he continues to show the character's face even though his speech is over, he makes the audience see the expression on the faces and eyes and question whether he is telling the truth. What determines the two cutting preferences is the internal rhythm of the shot and what the audience is asked to think. There are three problems here, according to Murch:

1. Finding possible breakpoints (taking advantage of your own blink points can make your job easier)[2]
2. To determine the impact of each breakpoint on the audience.
3. Deciding which of these influences would be most appropriate for the film (2005, pp. 16, 57-58).

The editors hesitated on the question of "Can artificial intelligence someday provide this?", it was stated that the plans could be roughly combined by artificial intelligence, but in the end, human intervention would be needed.

It can do it in terms of continuity, but I don't think so in terms of angle. In continuity, a plan is taken twice and three times, it has a close shot, it has a wide shot, it can follow this. For example, it can continue in the wide shot plan where throws his/her other foot as the continuity of the scene from where it throws his/her but I do not think that the perception of angle change in the scenes can do the situations in such a decision to be made by the director (Abdurrahman Seçer).

For example, I started editing, sometimes I like to start backwards, I start from the beginning, the end point is my beginning, I actually draw a kind of circle. Such an alternative to the device should be considered by itself or the director. One should be able to perceive and think what one is thinking, so that one can communicate directly with you (Kartal Uzun).

We anticipate that it can do something somehow because it can improve itself,

[2] According to Murch, one way to find out where the breakpoints are is through our own blink points, which underline our thoughts, even if we don't realize it. The point where the eyes are blinked while listening to what is said carefully is the point where it would be appropriate to cut.

> but it seems to me that art is something unique to human beings. If it can be done, it can be done, but I don't know if thinking humanely is something that can be learned. I don't think thinking humanely is something that can be learned, because let's skip the psychology aspect or the neurology aspect of it, there is also an endorphin aspect to it, there is also a hormonal aspect to it. Because the first trigger point for the artist is not the idea coming to his mind, but his hormones. Hormones guide them, and when it comes to this, I honestly don't think artificial intelligence will reach that level (Çağlar Barikan).

However, there are also editors who state that artificial intelligence is a cloud technology and that it will memorize every decision of the constructor, that is, it will start to cut in the logic of "human constructor" over time through machine learning. Because artificial intelligence is already recording every move we make. In line with these movements, it has learned and continues to learn new decisions very quickly so far. According to the editors, who are more optimistic about this issue, artificial intelligence cannot comprehend emotion. Today's artificial intelligence can combine the clips given today, but it combines them from the wrong place, cannot find the peak of the emotion in the image, and chooses a more standard range. Correcting what you do is a waste of time. However, if it learns the job of adding emotion and feeling, it can do the editing better.

> Artificial intelligence is a cloud. Artificial intelligence records every move we make right now. It makes new decisions in line with these movements. In this learning process, it has learned so quickly now that it is drawing incredible conclusions for us. Let's say that this feature came when I started editing, it did the editing I wanted, but I need to intervene. The artificial intelligence will follow my movements and say, "Why did he stop here?" Then you will make edits and you will probably cut in the same place with the same artificial intelligence tool. If someone is crying, you will show them a look to show their sadness. After 100 people do this, when you say, do edit to artificial intelligence, it will cut it like that and you will say, "How did it understand this?" It understood this in the process that I, you and the third, fourth million people did, it has no chance of not finding out. Because we are talking about a structure that moves with machine learning, artificial intelligence moves with machine learning (Erdem Genç).

> It's not in a position to have a limited (AI), dramatic effect right now. You know, we human have emotional touches and AI has not reached this position. Maybe when it comes to addressing those feelings, what you say will happen. I think it will be, so it seems like it will be. After all, emotions are also mathematics, so cinema is also mathematics. Maybe it is a bit of a human effect, certain routes are drawn with certain prompts, and maybe it seems like it can catch up with that feeling thing and the gap (Cantekin Cantez).

> Whether artificial intelligence imitates emotion or acts on this motive is scary, but it can be. If artificial intelligence feels that emotion rhythm, maybe an artificial intelligence that can think will also have that emotion. I can't say no directly, the human factor is still important right now. In editing, I care about feeling the thing. Sometimes I edit like that, I play footage and stop anywhere, this is the breaking point. But of course, this place is very subjective for me. So can artificial intelli-

gence do this, yes it can. I think it might be (Deniz Salmanlı).

Alan Turing, a British logician and mathematician, wrote the first modern paper on the possibility of mechanizing human intelligence in 1950, and argued that machine intelligence could be explained by the Turing test. The Turing test is based on the principle that a computer that tries to fool the interrogator into believing that it is human does so in the most successful way. Scientists continue to work on the question of whether human-level intelligence can be created and general artificial intelligence can be achieved if all tools such as artificial learning, neural networks, and natural language processing developed from the 50s to the present day, which Turing set as a goal for the mechanization of intelligence at the human level, are combined correctly (Nilsson, 2011, p. 66).

**Artificial intelligence tools and the future of the editing profession -professional concerns**

According to the editors who participated in the interview, the biggest change and transformation that artificial intelligence tools will create in their professions is that they will reduce the number of people doing this job. The fact that artificial intelligence tools are based on prompts may oblige editors to add prompt authorship to their skills in the short term. However, there are editors who do not like the idea of editing by writing prompts. These editors stated that the software they used was already structured in such a way that they did not need to enter prompts. The editors emphasized that they currently use artificial intelligence in a way that facilitates their work, and that artificial intelligence will synthesize the existing one and put a product but cannot create a brand new product.

Okay, after 5-10, okay, these events will come to a much more perfect level. It has already been tried for two years and the result of the experiment is 40-50%. We import all images in editing programmes, we select the music, we put each of them into the timeline, and we tell do edit it according to the rhythm of that music with only one command. It turns out that this can satisfy us by 50%, why? Rhythmically, the program cut the clips in my name, but where it put them, but it puts them in the wrong places. When we say wrong place, for example, after the recording is said, it is the place where it focuses on the scene, let's say in the tenth second, but it puts the third second and the seventh second, and then I try to hold it and fix it, it becomes a two-time time for me. Does it do it, but how much does it, it does it as much as you give him, where your skills are not here, where the feeling you add is not here (Abdurrahman Seçer).

According to the editors, it takes 5-10 years for artificial intelligence to be efficient, even if it is possible to produce only by typing a prompt without editing a camera with *Sora*. For this reason, although it seems like a revolution to work on software like *Avid* after tape technology, they said that they are now facing a bigger revolution.

> Technology has improved a lot since I entered the industry. Previously, for example, there were no HD images, 4/3 narrower screens, then HD came, 2K, 4K came, 3D movies were shot in Türkiye, and I worked. There have been units that have experienced the great ease of this, but nothing has changed in the working of the editors. Nothing has changed the way we do business much. That revolution happened once we switched from scissors to digital. Some employees' work has become easier, for example, post-production managers can connect to the computer from their homes and check out. They used to come to the studios to check out, but now they can do it from their homes. There have been many things that have become easier, but I haven't seen that editing has become much easier. The thing is that now anyone with a computer at home can edit, or even edit from their phone. We see beautiful edits on Instagram and Twitter. It works for them, they can edit more easily. But for people who are actually in this profession, editing TV series and movies, the current artificial intelligence technology makes no difference to us nothing has changed (Mahmut Aran).

> That transformation has already begun. I can even say that we have transformed a lot. Right now, there is a situation like we got out of the carriage and got on the space shuttle. We use artificial intelligence tools designed and coded very logically with *DaVinci Resolve*. Whether it is a subtitle, whether it has features such as making 3D light on a 2D video, or whether it is to choose according to the focus of image to give different effects to the focus area or the blurry area (Cenk Kaptan).

> In 5 years, the industry will change completely. In other words, when *Sora* came out, even in our institution, cameraman friends started to say "we are unemployed". You know, yes, from a visual point of view, in terms of the camera, maybe they won't always have to go everywhere, but I think it will change very quickly. Faster than the blink of an eye but some time will tell if our profession is dead or not. As I said, it seems that the human hand will continue in certain jobs while it is used in certain jobs (Cantekin Cantez).

However, as technology advances, the actual quality of the work done decreases. Although it is visually attractive, it may remain weak in terms of content. How artificial intelligence is obtained and for what purpose it is used becomes very important. If used by intellectually strong people, very important studies can emerge in terms of both aesthetics and content, but in the opposite case, it can only save the day.

The view of the editors is that artificial intelligence will not eliminate the profession in the near future, but will transform it. Accordingly, it has been stated that the editors who read artificial intelligence well, can follow not only editing technology but also artificial intelligence tools well, can give good commands, and work the most accurate and fastest will take the lead. In the distant future, when you say "I want a editing consisting of long plans and in the style of this director", it is not impossible that there is an artificial intelligence that can do it together with the sound and sound effects.

> Maybe someday we'll put the random plans somewhere and say, here, edit this, maybe it'll finish the movie. As far as I understand, it can't do that right now. It's making our job easier right now. It is not very close if it can take our profession from us, but it is certain that the qualification of the editor will change. Perhaps

> the most accurate and fastest-working editor who can give good commands who can follow artificial intelligence tools well, not only editing technology, will become a person who reads artificial intelligence well (Deniz Salmanlı).

> As I work with artificial intelligence, the name of artificial intelligence will be Alaattin Abuçka, it will learn my working style, then the programmer will work in the same way as I work, then I can be pushed aside. However, in order for this to happen, the programmer must adapt to artificial intelligence. Those who joined the profession 3-5 years ago or will do so in the future may adapt to this system, but I do not think that most of the existing ones can adapt to this system (Alaattin Abuçka).

> Honestly, I have no doubt that editing will disappear. The reason for this is that artificial intelligence is learning very fast, there is a big difference when we compare it to the present when it first came out. At the moment, this has not come yet, but I am sure that when you say you want an edit in the style of this director with long takes thanks to the artificial intelligence add-on of an editing program, all the plans of a film you have made - this will definitely happen in a few years - I am sure that it will edit with its sound and sound effects (Erdem Genç).

The use of artificial intelligence in editing also raises many problems. There are copyright problems with artificial intelligence, which produces everything by learning. Arrangements need to be made urgently in this regard.

> (…) I was amazed by an add-on that came out recently, and then when I started to examine it a little bit, we started to see that artificial intelligence damaging the things that people do. For example, people in the music market started to object and said that they were playing our rhythms, playing our compositions and lyrics and nothing is being done about it. In other words, it is also revealed that something done by human hands also harms human beings (Abdurrahman Seçer).

According to the editors, the products produced in Türkiye currently contain stereotyped elements because the artificial intelligence data is not sufficient in terms of local elements. Things made with human labor may be more valuable in the future. The idea that its texture and taste will be different is dominant in editors, and although the use of artificial intelligence in standard works has increased, it is thought that the human hand will be preferred in works that require art and aesthetics. The editors also discussed artificial intelligence in terms of human-specific emotional intelligence, and since this feature cannot be installed on computers, it was emphasized that human touch would be absolutely necessary in editing.

> When you start each show, you try to create a new genre in each show, for example, you edit it more briskly. You edit more slowly, for example, I'm trying something different to the series I'm doing right now. I don't know what it is, I mostly find it by trying. Artificial intelligence can't work like that now. You can make a table, the measurements are obvious, but cutting the knee, cutting the film is not like that. Artificial intelligence is very technical. For example, I catch a play, I catch something, the spirit of the stage changes, the atmosphere changes. Artificial intelligence has no sense of how to catch it. It should be able to think like me and experience what I have experienced (Mahmut Aran).

> The editor should be able to condense the emotion he gets from the shot scene with his own emotion and present it to the audience. For example, X enters through the door, says hello to Y, and Z looks at him. So artificial intelligence will think about these. Even if it puts something like X in, Y you look at him, Z you react to him in a row, I'm not sure what kind of decision it will make on things like which cut point it will take from which cut point it will pass to the other, so I'm not sure what it will decide according to. I don't think artificial intelligence can do it, I don't think such an artistic thing can come out even if it does (Yakup Efe İnanlı).

> Artificial intelligence can replace the editing operator. But I think it cannot replace the editing director, my opinion is in this direction. It can replace the editing operator, because simple cuts, fast cuts that we call jump-cuts, etc., were already manually programmed. Now it can be done with artificial intelligence and it speeds up the workflow. Normally, our first expectation from the editing operator is to reveal the rough editing. Colorist gets involved, motion graphic designer gets involved afterwards. I'm talking about big productions, of course. Therefore, artificial intelligence cannot come to the directing, that is, artistic part, I never think that it can. I honestly believe that artificial intelligence cannot be evaluated under the concept of artist (Çağlar Barikan).

> When you show a scene and say apply the colors in this scene to it, there is a situation like artificial intelligence can do this, in fact, up to certain points. In terms of painting, yes, maybe it can do it mathematically, but for example, as a human being, we can understand the feelings of certain things. It can paint a very beautiful picture, but I don't know if it can reflect the emotion you want to reflect. When you say, "I want people to feel this when you look at this picture," I think artificial intelligence is not so competent to give the things that will enable it (Candan Karamanoğlu).

> I don't think artificial intelligence will eliminate the profession of editing. It will change, but the storytelling will not end. Since storytelling will not end, cinema will not end, and editing will not end. Only the methods of doing so will change. All costly issues will be eliminated. Human will continue to be a decision maker (Cenk Kaptan).

According to the editors who participated in the interviews, artificial intelligence may replace the editing operator in the future and take over the jobs that need to be treated more automatically. It has been emphasized that working methods may change, filmmakers who do everything will be effective, individual works will come to the fore instead of teams, and films will be made with an auteur attitude.

## Conclusion

The trailer editing of the 2016 *Morgan* film by director Luke Scott, which would normally take 10-30 days, was completed in just one day with the artificial intelligence technology used for the first time (20th Century Studios, 2024). Since then, artificial intelligence tools in film editing have changed the business practices of editors with automatic uses that reduce the tasks at hand.

Many of the operations that could previously be done with the important tools of 'compositing' software such as *Inferno*, *Adobe After Effects* and *Apple Motion* can now be done in a much more practical way with artificial intelligence tools. Artificial intelligence tools create high-quality, one-minute-long videos with the commands entered by typing text, transform the uploaded pictures, photos or drawings into moving images, change the background of the objects, produce sounds suitable for the videos, monitor the masked areas with a rotoscope, change the speed of the videos, and make color edits. These processes, all of which can be defined as vertical editing, show that with the transition to digital editing, the number of effective studies defined in editing software has increased. In addition to the work of creating meaning on the horizontal plane by combining plans in basic editing theory, editors have to undertake more effects work.

In this study, which was designed in qualitative research design, the in-depth interview method was adopted and an informed signed voluntary consent form was obtained from all the editors participating in the study. In the in-depth interview, research questions were asked to the editors and the findings obtained were analyzed by descriptive analysis method. The editors who participated in the interview stated that they could easily do some of the work done by visual effects experts with artificial intelligence tools in a short time. In addition, they can now solve some of the problems they experience and receive support from. Although this gives the impression that the editors increase the business volume, it actually shows that the work that takes a long time and needs more people to work on decreases. Artificial intelligence tools are able to easily perform the work done by the employees, especially in the visual effects part of the post-production process. With the inclusion of tools in the editing software, editors can now complete a production from the beginning to the end in a short time. It has been observed that artificial intelligence tools are useful for productions that require graphics, text, and effects such as videos, TV programs, and documentaries, and they significantly facilitate the work of individual videographers and amateur social media producers. However, artificial intelligence tools are not effective today in jobs that involve complex decision-making processes such as series or motion pictures and cannot be reduced to certain algorithms.

Although the operations that the editor can do in the editing software enriched with artificial intelligence tools have increased, the editors have hesitated when it comes to cutting and combining the feeling of the film at the most appropriate moment to provide its rhythm and creating meaning with editing. According to Walter Murch, there are fifteen possible cuts for each cut in the films. Some of these are tried and removed from the final editing. However, not all possible editings can be tried because human memory is limited (Murch, 2005, p. 3). Can artificial intelligence try all possible interruptions and decide on the most appropriate editing? When the artificial intelligence tools, which easily perform the operations of the editors regarding the effects at the moment, quickly make all possible cutting points appropriate for the

given scenario and give it to the editor, it will be up to the human editor to decide the most appropriate one.

It is certain that artificial intelligence will undergo significant transformations in the profession in the near future, especially the decrease in the number of editors. The editors emphasized that they would continue to tell stories by adapting to artificial intelligence tools. Artificial intelligence reveals its own aesthetics in the field of cinema. As a matter of fact, the festivals of films produced with artificial intelligence hosted by countries such as America, France, Spain and Dubai, the first of which started to be made last year, are an indicator of this. Cinema technology has changed film production throughout the history of cinema. It is among the predictions of the filmmakers who make a movie from beginning to end with the support of artificial intelligence technology, where smaller teams and even individual works will come to the fore and films will be made with an auteur attitude.

The great leaps in artificial intelligence technology in a short time have increased the expectations about the future and the concerns about the professions. However, it is unlikely for editors to undertake the practice of editing, which is defined as a human-specific emotional or even hormonal function and consists mostly of subjective decisions made by editors with artist meticulousness. According to them, human touch and creativity will always be important in this business. Nevertheless, if artificial intelligence can mimic human emotion, although it seems unlikely in the near future, can we talk about the inhuman effect of a man-made technology on human beings?

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