ROLE OF AI IN VIDEO EDITING

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ABSTRACT

The advent of Artificial Intelligence (AI) has revolutionized the video editing landscape, transforming traditional practices and workflows. AI-powered video editing tools have emerged, enabling editors to automate repetitive tasks, enhance creativity, and improve efficiency. This study explores the role of AI in video editing, examining its impact on the creative industry, and investigating the benefits and limitations of AI-driven video editing. This research aims to provide insights into the current state of AI in video editing, identifying key applications, and analyzing the future directions of this technology. By investigating the intersection of AI and video editing, this study seeks to contribute to the understanding of AI's potential to augment human creativity, and to inform the development of AI-powered video editing tools that enhance the creative process

KEYWORDS – Role of Ai in video editing, video editing ,AI use ,Artificial in editing

INTRODUCTION

The video editing industry has experienced rapid growth, driven by the proliferation of digital platforms, social media, and streaming services. This growth has increased demand for high-quality video content, putting pressure on editors to deliver efficient, creative, and high-quality outputs. Traditional video editing methods are time-consuming, labor-intensive, and prone to human error, making AI-driven solutions attractive.Recent advancements in AI, machine learning, and deep learning have enabled automated video editing solutions. Adobe Premiere Pro's "Sensei" (2017) and Blackmagic Design's "DaVinci Resolve" (2018) integrated AI-driven features, marking a significant milestone. AI-powered video editing tools now offer object detection, facial recognition, colour grading, audio enhancement, and content-aware fill. Despite these advancements, limited research exists on AI's impact on video editing workflows, creativity, and collaboration. This study seeks to address this knowledge gap by investigating AI's role in video editing, exploring its benefits, limitations, and future directions. Video editing has long been a labor - intensive process, requiring immense skill, creativity, and attention to detail. Traditionally, video editors spent countless hours manually cutting footage, adjusting audio, adding effects, and enhancing visuals to create a final product. However, in recent years, artificial intelligence (AI) has revolutionized this field, making the editing process more efficient, accessible, and even more creative. AI's role in video editing has grown rapidly, transforming the way content is produced, edited, and consumed.

REVIEW OF LITERATURE

A.   **Kimura et al. (2005) and Casares et al. (2002)** discussed the potential of AI to streamline basic tasks in video editing, reducing the need for manual intervention and allowing editors to focus on higher-level creative work. The development of intelligent video editing systems has made it easier for non-experts to create professional-looking videos with minimal effort (Kimura et al., 2005).

B.   **Kawahara et al. (2019)** demonstrated how GANs can be used for video restoration and enhancement by reconstructing missing frames and improving image quality (Kawahara et al., 2019). AI's capabilities extend beyond automation into more creative tasks. Generative Adversarial Networks (GANs) have emerged as a revolutionary tool for video effects, enabling high-quality video enhancement such as resolution upscaling, realistic visual effects, and color grading

C.   **Wu et al. (2015)** explored the use of AI for automatic video summarization based on user behavior, such as preferred viewing segments. This has been particularly useful in industries such as advertising, e-learning, and social media platforms, where customized content can increase engagement and viewer retention (Wu et al., 2015).

D.   **Berthouzoz et al. (2012)** highlighted AI systems that can automatically transcribe speech and synchronize the transcript with corresponding video segments, making the editing process faster and more accurate. These tools have revolutionized editing workflows by providing editors with scripts and precise timestamps for easier content navigation (Berthouzoz et al., 2012).

E.   **Yamada et al. (2023)** discussed how AI is used in live-streaming environments to apply effects like facial recognition, background removal, and even automatic scene transitions, enabling seamless production quality without human intervention during the live session. This is particularly important for platforms like Twitch, YouTube, and Facebook Live, where high production quality is essential for viewer engagement (Yamada et al., 2023).

OBJECTIVES OF RESEARCH

A.   **Examine the Automation of Video Editing Tasks** Investigate how AI is automating repetitive tasks in video editing, such as scene detection, color correction, and audio balancing. This objective aims to understand how automation accelerates workflows and enhances productivity, freeing editors to focus on more creative decisions (Kimura et al., 2005; Casares et al., 2002).

B.   **Evaluate AI's Impact on Video Quality Enhancement** Assess the effectiveness of AI tools, especially Generative Adversarial Networks (GANs), in improving video resolution, restoring low-quality footage, and enhancing visual effects. This research will explore how AI helps create high-quality content from older or damaged video materials (Kawahara et al., 2019).

C.   **Analyze the Role of AI in Supporting Creative Decisions in Video Editing** Explore how AI assists in creative processes, such as recommending edits based on narrative structure or emotional tone. This objective will focus on AI's role in supporting video editors to make informed creative choices (Pérez et al., 2020).

RESEARCH OF METHDOLOGY

A mixed-method approach will be used, incorporating both qualitative and quantitative methods:

- **Qualitative Approach:**

    o   In-depth Interviews: Conduct interviews with professional video editors and AI developers to understand the practical applications, benefits, and challenges of using AI in video editing. These

interviews will explore perceptions of AI tools, their influence on creative workflows, and ethical considerations.

o   Case Studies: Analyse existing case studies where AI tools have been used in video editing, such as projects involving AI-driven colour grading, video enhancement (e.g., GANs for upscaling), and automatic editing (e.g., Adobe Sensei).

- **Quantitative Approach:**

o   Surveys: Distribute surveys to video editing professionals, content creators, and AI users to gather data on the prevalence of AI tools, the time saved, and their effectiveness in different video editing tasks.

o   Content Analysis: Perform a comparative analysis of AI-generated video content and traditionally edited videos to assess quality differences, such as resolution, colour accuracy, and editing speed.

3. Sampling

- Sample Size: The research will target a diverse group of respondents including professional video editors, AI developers, and content creators. A sample size of 100-150 respondents will be ideal for surveys, while around 10-15 experts will be selected for interviews.

- Sampling Technique: Stratified sampling will be used to ensure representation across different video editing tools (e.g., Adobe Premiere, Final Cut Pro, AI-powered tools like Magisto, etc.) and industries (e.g., entertainment, advertising, YouTube content creation).

4. Data Collection Methods

- Surveys: Online surveys will be distributed via platforms like SurveyMonkey or Google Forms. The surveys will include both closed and open-ended questions.

- Interviews: Semi-structured interviews will be conducted with video editors and AI experts. These interviews will be audio-recorded and transcribed for analysis.

- Case Studies: Data from existing video projects that employed AI-driven tools for editing, enhancement, or personalization will be reviewed. This includes analyzing user engagement statistics on platforms like YouTube, where AI plays a role in content recommendations.

5. Data Analysis

- Qualitative Analysis: Data from interviews and case studies will be analyzed using thematic analysis. This approach will allow identification of patterns and key themes related to the effectiveness of AI tools in video editing, as well as ethical concerns.

- Quantitative Analysis: Statistical analysis, such as descriptive statistics and regression models, will be applied to survey data to assess correlations between AI usage and video editing efficiency or quality improvement. A/B testing will be employed to compare traditional video editing with AI-driven editing workflows.
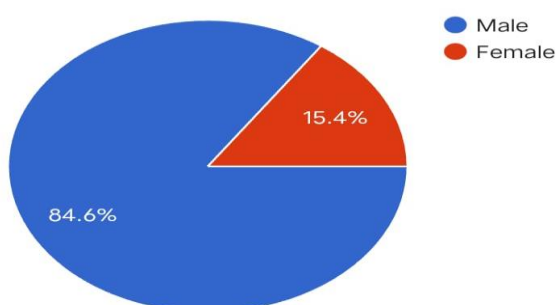
DATA ANALYSIS & INTERPRETATION

4.1 What is your gender?

  a) Male

  b) Female

  c) Other

Gender	Frequency	Percentage
Male	44	84.62%
Female	8	15.38%
Total	**52**	**100%**

Table 4.1

52 responses

Figure   4.1
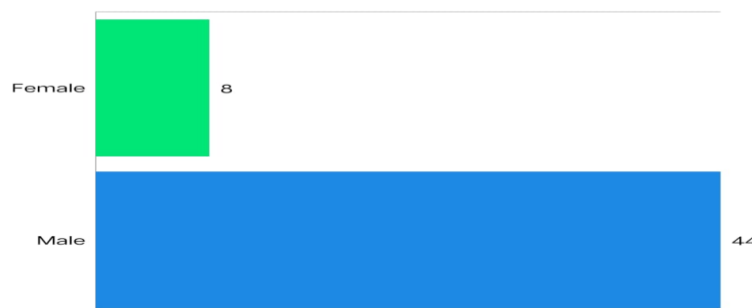

Figure 4.2

Data analysis:

From the above graph and table, it is observed that out of 100 responses. 44 Respondent of male with 84.62% and ,8 respondent of female with 15.38%

Interpretation:

It is observed the most of the respondents are male and lover respondent are female in this research.

4.2 Age.

a) 18 – 24

b) 25 – 30

c) Above 30

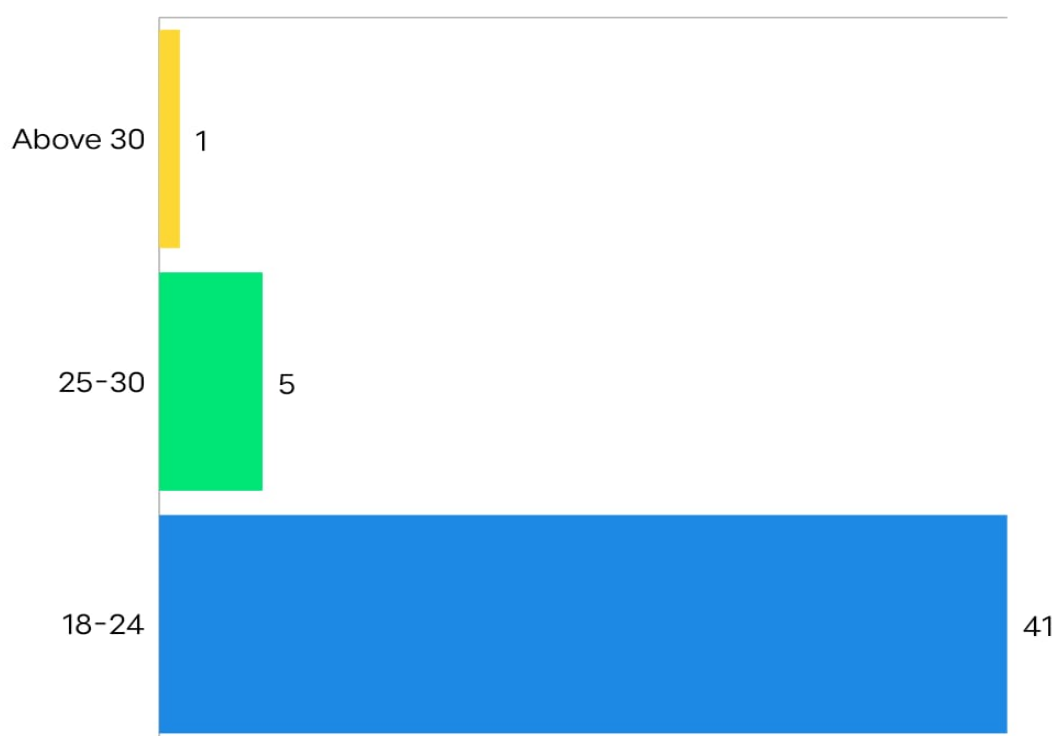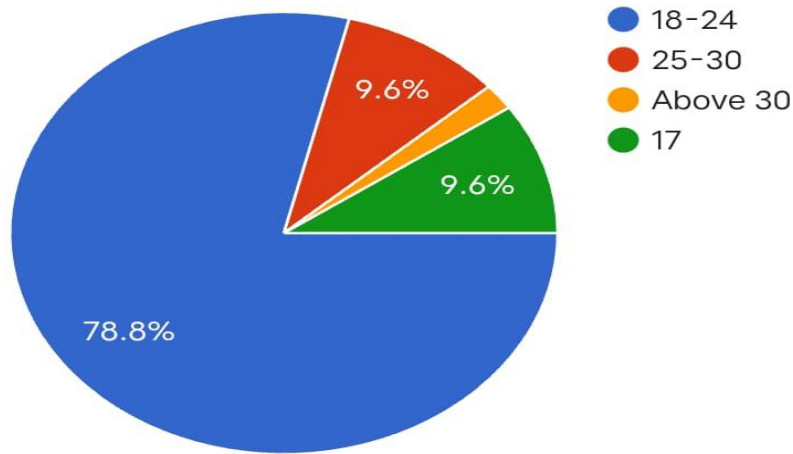| Age	Frequency	Percentage
18 – 24	41	78.85%
25 – 30	5	9.62%
Above 30	1	1.92%
No answers	5	9.62%
Total	**52**	**100%**

Table 4.2

Figure 4.3

52 responses

Figure 4.4

Data analysis:

From the above graph and table, it is observed that out of 100 responses, 41 respondent are from 18-25 age group with 78.85 %, 5 respondents are from 25-30 age group with 9.62% , 1 respondent are from above 30 age group with 1.92% and 5 people are not responded.

Interpretation:

It is observed the most of the respondents are in the age group of 18-24 Years and the less number of respondents belong to the age group of above 30 years.

4.3 What is primary function of AI in video Editing?

   a) color correction

   b) Audio enhancements

   c)Automation and efficiency

   d) Visual effects

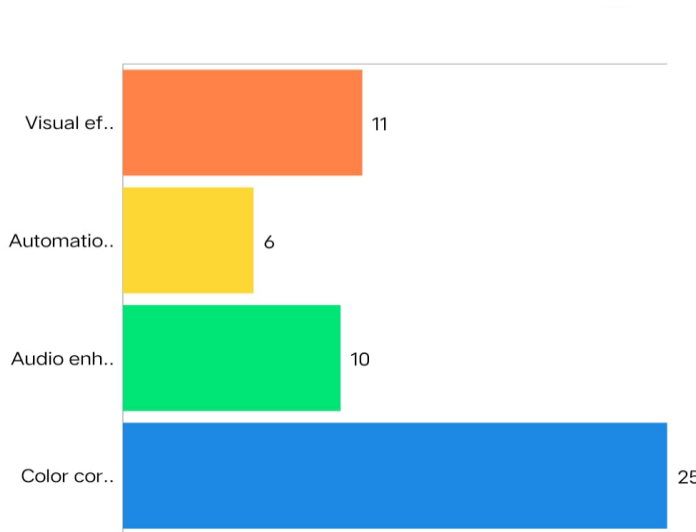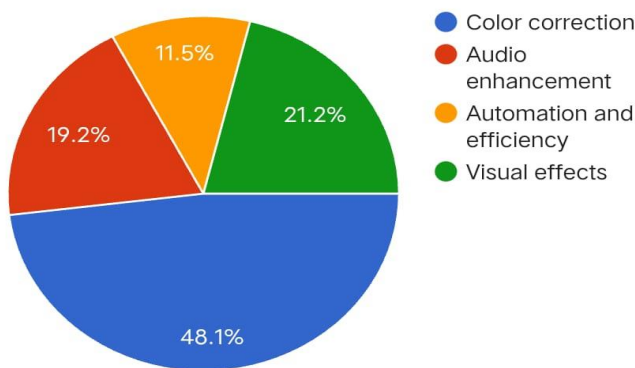| Field of study	Frequency	Percentage
color correction	25	48.08%
Audio enhancements	10	19.23%
Automation and efficiency	6	11.54%
Visual effects	11	21.15%
Total	**52**	**100%**

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Figure 4.3

Figure 4.5

52 responses

Figure 4.6

Data analysis:

From the above graph and table, it is observed that out of 52 responses, 25 respondent are from color correction with 48.08 %, 11 respondents are from Visual effects with 21.15%, 10 respondent are from Audio enhancements field with 19.23%, 6 respondent are from Automation and efficiency

 field with 11.15%

Interpretation:

It is observed the most of the respondents are in color correction field and the less number of respondents belong to Automation and efficiency field.

SCOPE OF RESEARCH

LIMITATION

A.   Dependence on Technology

B.   Relies heavily on the availability and stability of advanced AI algorithms and software.

C.   Cost Barriers

D.   High investment required for premium AI-based video editing tools, limiting accessibility for small-scale creators.

E.   Skill Gap

F.   Requires specialized knowledge to utilize AI features effectively, posing a challenge for beginners.

G.   Creative Restrictions

H.   AI tools may lack the nuanced understanding of human creativity, leading to generic outputs.

I.   Data Dependency

J.   AI's performance is constrained by the quality and volume of training data, which may not cover diverse editing styles.

K.   Ethical Concerns

L.   Risks associated with authenticity, such as deepfakes or unauthorized content manipulation.

M.   Limited Customization

N.   AI-generated edits may not always align with specific artistic visions or client preferences.

O.   Processing Constraints

P.   Complex AI functions may demand significant computational power, affecting efficiency on less capable systems.

Q.   Rapid Technological Changes

R.   Constant updates and evolving tools can make older AI software obsolete, requiring frequent adaptations.

S.   Unpredictable Outcomes

T.   AI algorithms might produce inconsistent or unexpected results in certain editing scenarios.

CONCLUSION

The role of Artificial Intelligence (AI) in video editing has grown dramatically over the last few years, reshaping the landscape of both professional and amateur video production. AI has been integrated into various stages of the video creation process, from editing and enhancement to personalization and distribution. This evolution has resulted in more efficient workflows, expanded creative possibilities, and the ability to streamline otherwise complex and time-consuming tasks.

One of the most prominent benefits AI brings to video editing is the automation of repetitive and mundane tasks. AI-based tools can automatically identify and cut scenes, apply color grading, and adjust sound levels, which traditionally required a significant amount of manual work. This automation not only accelerates the editing process

but also allows editors to focus more on creative and higher-level decisions rather than technical details (Casares et al., 2002). Additionally, machine learning algorithms can be employed for tasks like speech recognition and object tracking, making it easier to edit content that involves large amounts of raw footage, such as documentaries and feature films (Berthouzoz et al., 2012).

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