

Ethos of Traditional and AI-Driven Transformation in Punjabi Cinema: A Multi-Dimensional Perspective of Producers, Directors, and Filmmakers

Gurnam Singh Bhullar¹, Shalini Sharma², Sukhmani Kaur³

¹ Research Scholar, Chandigarh University, Mohali, Punjab, India, bhullargurnam8@gmail.com

² Department of English, UILAH, Chandigarh University, Mohali, Punjab, India, shalinisharma.cgc@gmail.com; shalini@cumail.in

³ Department of Commerce, USB, Chandigarh University, Mohali, Punjab, India, sukhakal313@gmail.com

Abstract

Purpose – The purpose of this study is to explore the extent and nature of artificial intelligence (AI) adoption among directors and producers in the Punjabi film industry. By using a diffusion of innovation lens, the study examines how AI is reshaping creative and production practices, and investigates how industry stakeholders perceive its influence on production efficiency, audience engagement, market competitiveness, cultural authenticity, and ethical responsibility.

Design/methodology/approach – This study employs a qualitative, interview-based research design. In-depth interviews with directors and producers actively working in the Punjabi film industry were conducted. The interviews were structured around real-life constructs (RLCs) depicting concrete AI-related production scenarios including AI-assisted scripting, visual effects, digital recreation of actors, and audience-targeting analytics enabling participants to reflect on their own motivations, apprehensions, and expectations regarding AI's role in filmmaking.

Findings – Directors and producers demonstrate varying levels of AI awareness and adoption, ranging from cautious experimentation to active integration in pre-production, production, and post-production workflows. Findings suggest that adoption is shaped by a tension between technological opportunity and the industry's regional cultural identity.

Originality/value – This study is among the first to examine AI adoption specifically within the Punjabi film industry, a regional cinema context that remains underrepresented in existing AI-and-film literature dominated by Hollywood and global case studies. The study offers a foundation for an AI Adoption and Transformation Framework tailored to the sustainable growth of Punjabi cinema, with implications for policymakers, industry bodies, and film professionals navigating AI's cultural and ethical stakes.

Keywords: Film Production, Contemporary Cinema, Artificial Intelligence, Punjabi Cinema, AI-Generated Narratives, Cinematic Innovation.

1. Introduction

Punjabi cinema has always been a reflection of the collective identity of Punjab, the region's folklore, agrarian beats, migration tales, Sikh cultural values surrounding love, land and loss. The industry has been dependent on oral narration, live music and actual production skills from the black and white melodramas of the 1930s through the family dramas of the last 20 years to the

Punjabi-pop infused blockbusters of recent times. The adherence to 'traditional' mode of production isn't just a formality or a stylistic preference, it's also a message of authenticity, collective memory and cultural continuity in a film, which makes it a Punjabi film and not mainstream South Asian film.

Today, the advent of artificial intelligence is changing the way cultural products are visualized, developed, shared and used. AI is the next wave of the newest innovations that the medium has embraced, from sound to colour, computer-generated imagery and digital cinematography. Using the AI has been adopted by filmmakers in a number of ways from scriptwriting to video generation, video editing and music composition, and is a common part of the filmmaking process globally (Azzarelli, Anantrasirichai and Bull, 2025; Entertainment Computing, 2026). More generally, Anandraj and Aravind (2023) reference the changing nature of filmmaking to be a broader 'digital age' process in which the use of AI is impacting not just how films are made, but how the industry is economically and organically made. Chow (2020) also records the beginnings of the use of AI within the fabric of the Hollywood production process, calling it a 'ghost in the machine' that is subtly reshaping established craft processes from the inside.

AI powered productions are slowly taking the centre stage in India and the Punjabi film industry (also known as Pollywood) is trying to build its presence in the traditional cinema halls and in the international market as well as on digital platforms. Recent developments show the extent of this transformation so far: The Punjabi film industry has already experimented with using artificial intelligence to digitally recreate the late actor Jaswinder Bhalla in the film Carry On Jatta 4, as detailed later in this paper. This broader conversation in India revolves around the potential of AI to enhance accessibility and cost-effectiveness without sacrificing the human touch in filmmaking. This transformation is particularly impactful in India, where the country's linguistic, cultural and industrial diversity is leading to the use of AI for pre-production, production and post-production processes, for creative development, operational efficiency and cinematic presentation respectively (Khan et al., 2025). Meanwhile, AI's impact on human creativity, copyright, jobs and ethical issues of AI-generated cultural output, as seen in Islam's (2022) study of Anukul, the Indian film, sparks important questions regarding the interaction between humans and intelligent machines that are not a simple technological/legal problem.

The regional deployment of Punjabi cinema is a pertinent example as it has become part of a 'post-theatrical' media landscape that includes digital platforms, online promotion, diasporic audiences and transnational distribution. This growth has generated a demand for technological solutions that can enhance the efficiency of production, reach of audience, and accessibility across the globe. However, Punjabi cinema is deeply embedded with the language, humor, songs, familial relationships, migration, and regional identity, thus posing the core question that this study tries to answer: What are the costs of the efficiencies that AI provides? This question does not merely involve the debate of whether AI is good or bad for Punjabi cinema; it also queries how the tech will influence creative choices and portrayal, and what moral boundaries need to be in place for its usage.

1.1 Background of the Study

The Punjabi film industry has gone beyond the traditional theatrical business model and has diversified into a hybrid industry comprising of theatres, OTT platforms, YouTube, music platforms and social media. There has been an increased opportunity of regional-language content

through digital distribution and new ways of engaging the audience. While earlier digital technologies had mostly focused on distribution and editing, AI is now able to help with content creation itself. From the semiotic perspective, Danesi (2024) provides a framework for understanding how the newly emerging AI-generated cultural products might be received as a new set of semiotic systems that reorder the ways of making meaning in popular culture, which is useful for analysing how AI-assisted content might be perceived in a culturally specific industry like Bollywood.

2. Literature Review

The key independent variable in this study is the use of AI for filmmaking, which includes issues related to the knowledge of and familiarity with AI technologies, familiarity with specific tools, frequency of use, confidence in using AI and the preparedness of production organisations for technological integration. Four measures of impact are discussed: creative transformation (enhancing storytelling, visualisation and experimentation using AI); production efficiency (time management, planning, resource usage and cost control); audience engagement (AI-driven analytics, promotion and personalised/multilingual communication); market competitiveness (Punjabi cinema's ability to compete in Indian and international entertainment sectors).

Cultural relevance is given equal importance to the efficiency of adoption of AI technologies in Punjabi film-making and therefore, cultural authenticity is as important as efficiency in the assessment of the use of AI in film-making. Two additional constructs are thus embedded in the model: cultural authenticity, in which Punjabi language and humour, social realities and regional identity are preserved and ethical awareness, which includes concerns about copyright, consent, digital representation, authorship and employment.

2.1 Integration of AI throughout the film industry value chain

The use of AI is no longer just a part of the post-production process but is now considered a game-changer for the entire film industry value chain in recent years. Tsiavos and Kitsios (2025) conduct a systematic review of 74 articles from Scopus and Web of Science, revealing that AI has seeped into every aspect of authorship, production, dissemination, and exhibition, with its impact on ethics around authorship, creative integrity, and labour displacement only partially explored. They paint a picture of a relatively positive attitude towards AI's role in decision-making and audience targeting, and a more cautious perspective on AI's encroachment on creative authorship, a tension which is extended in this study by the personal experiences of industry practitioners, not just by survey results.

Complementary evidence is based on a systematic review of deep learning in film-making from 2019 to 2025, which discusses the development of diffusion models and generative adversarial networks (GANs) for video generation and visual effects, as well as automated scene understanding and multimodal content modification tools for video editing (Entertainment Computing, 2026). The review, combined with the postproduction work of Han & Shao (2022) and Liu's (2024) analysis of the use of AI in digital transformation, places AI into the role of an

'augmentative tool for creators' – not as a replacement for actors or editors as the main agents in the production process.

2.2 Technical and Computational Foundations of AI in Cinema

Most of the creative power that is evident in today's commercial filmmaking is based on a field of computational research that is not part of the film industry itself. Generative Adversarial Network (GAN) architecture, as introduced by Goodfellow et al. (2014), has been central to current image/Video-synthesis engines for Visual Effects applications and more recent Diffusion-based architectures, reviewed by Wang (2025), have added a new dimension in the synthesis of high fidelity visual art. Other recent trials in the field of visual aesthetics have been surveyed by Cao, Wang and Xu (2022), where they illustrate the ability of deep learning models to make increasingly accurate judgements of style and composition, previously made by human cinematographers; Elson and Wang (2023) illustrate the ability of deep learning models to transfer a target cinematic 'style' to novel footage.

Transformer-based language models, such as the text-to-text model of Raffel et al. (2020), are the foundation of many AI tools for writing and dialogue generation today; on the language and narrative side, Gao and Lee (2021) build on this work by introducing techniques for analysing the emotional plot of a film's story. Following in the footsteps of Huang and Liu (2021) who founded their research on similar data analytic principles, Huang and Liu (2021) investigate the use of AI-based narrative systems in interactive storytelling and in their ability to enhance the experience of their audience. In addition to the VR screen itself, Song and Wook (2020) examine how VR and IoT technologies are integrating into the movie and TV production process, and Singh, Rastogi and Kaur (2023) and Wang, Huang, Yang and Zhao (2023) report on the practical application of AI as both a visual effect tool and as AI-generated content (AIGC) in the digital film production pipeline. Still many researchers continue this debate specifically for the field of animation, stating that the age of AI-powered visual effects is revolutionising the creation and iteration of animation sequences.

This technical literature is evidence that the instruments that have now been made available to regional industries, including Bollywood, are not new pieces of technology but applied products of a sophisticated and rapidly evolving computational research programme, only a few of whose creative and cultural applications are examined for a particular regional cinema.

2.3 Global Perspectives: Regional and Non-Western Cinema

In the discussion of AI and cinema, attention is much less focused on regional production industries, and almost all existing literature focuses on Hollywood's production infrastructure. This gap Haqqi, Khan and Naveed (2025) directly tackle in their mixed-methods study involving 30 semi-structured interviews with filmmakers, audience survey, and three production case studies in the Pakistani film industry. According to their research, dubbing using AI can shorten the post-production time and reduce the time spent on dubbing into multiple languages, but also has a negative effect on older generations as they worry that AI dubbing is taking the creative passion

(creative love, junoon) of the original language, with younger generations more accepting of the new technology -- a trend that aligns with Rogers' (2003) Diffusion of Innovation theory.

Göker (2025) demonstrates that Indian films are not entirely an unmodified version of Western AI narratives, but are reworked along ethical notions like dharma and seva and the melodramatic convention of the genre. The result is in accordance with the current study, which is a practice-oriented approach to the understanding of the use of AI in a culturally specific cinema.

2.4 Ethical and Labour Issues: Creative Displacement and Deepfakes

Artificial Intelligence has been a major talking point in the world of film and media scholarship since the Writers Guild and SAG-AFTRA strikes of 2023. Bender (2025) contests the dominant 'replacing tasks' discourse over generative AI and the 'disappearance of human creative labour' in favour of a 'meaningful work' model of human-AI co-existence in creative industries. On this concern, Broinowski and Martin (2024) discuss deepfake regulation in screen production, highlighting production efficiencies that allow for de-aging of actors, resynchronised dialogue and the posthumous voicing of actors, but also questions of consent, likeness rights and the commercialisation of an actor's identity after his or her death - concerns that are also shared by Pakistani VFX artists and voice actors in Haqqi et al. (2025).

These concerns are part of a broader critique of the political economy of AI, as Crawford (2021) has suggested that the 'planetary costs' of artificial intelligence – whether in terms of labour extraction, environmental damage, or other aspects – are often hidden behind discourses that understand AI solely as a source of creative or economic opportunity. In broader perspective, this is a pertinent reminder to not view AI in the context of Punjabi cinema as a singularly positive development.

2.5 Industrial, Historical and Global Perspectives

This study also relies on the wider film scholarship on the rethinking of regional film industries as nodes in a global network, not just peripheral or isolated markets. In their edited volume (2021), *Industrial Networks and Cinemas of India*, Mehta and Mukherjee make a case that the Indian film industry, in general and the Punjabi, Tamil and Bengali cinema in particular, has always been marked by the mobility of technicians, money and creativity across the nation. The idea of integrating AI in Punjabi films as a seamless extension of a tradition of technological and industrial negotiations is valuable.

Another approach, media studies, is offered by Gillespie, Boczkowski and Foot (2018) who argue that new technologies are never culturally neutral, as their material form and institutions of use interact and together define the meaning attached to the technology by a society. When applied to Bollywood, this means that the cultural impact of the use of AI will rely as much on the institutional control of artificial intelligence as on its technical features. This trend is echoed by those in the industry: both Goel (2024) and Pradeep et al. (2023) describe how AI is being used in film pre-production planning, and Sun (2024) reports on the increasing role of AI in film production today, revealing that the use of AI in Punjabi movies is not an isolated trend within India, but a part of a broader global trend.

They also offer audience analytics, personalisation and reception. They also provide audience analytics, personalisation and reception.

Another area of research looks at the impact of AI on the interaction between cinema and viewers. Another line of inquiry explores the role of AI in transforming the film-viewer interaction. Li, Chen and Zhou (2023) examine the rise of 'personalised cinema', where AI systems such as recommendation algorithms and content adaptation algorithms are helping to make movie viewing personal, and Sun, Duan and Zhang (2025) review the trends and challenges to affective AI in film-audience analysis, highlighting that emotion-detecting systems have gained widespread acceptance for enhancing marketing and content strategy. Uddin et al. (2025) introduce a methodology for analyzing the innovations and challenges presented by AI throughout the film-making process, providing a structured approach to thinking about the pathways for adopting such technologies that are explored in the current work in an empirical manner. This conversation is continued by Valdivia Alonso (2026) who explores the socio-technical stories and social images mainstream cinema creates around AI futures, and argues that audience understandings of AI futures are social, and as much to do with fictional images of the technology as with its industrial uses.

In a more data-oriented approach, Liu and Liu (2026) use the SSIM, emotion-recognition accuracy and diversity metrics to assess the GAN- and CNN-generated cinematic visuals. According to their results, they achieve high perceptual similarity between the AI generated and conventional frames of film (SSIM values close to 0.90-0.94), with an acceptable reproduction of the emotional expression and visual variety. The authors point out that AI is not a creative agent, but rather an infrastructural facilitator that helps them with pre-visualisation, shot planning, colour optimisation, trailer building, and audience-preference modelling, and highlights persistent problems with semantic comprehension, narrative coherence, algorithmic bias, and maintaining the human creative contribution.

3. Research Problem

The intersection of AI and cinema has been a subject of increasing scholarly interest, but little empirical research considers the perspectives and experiences of regional filmmakers on this transformation. The voices of Punjabi filmmakers, especially those directors and producers are not heard much. The directors are at the heart of the artistic and narrative journey of a movie, whereas film producers are responsible for financial management, production oversight, distribution, and market viability. Both bring complementary views to the table, providing a more nuanced understanding of the practical impact of AI in film production.

This study aims to explore the perspectives of Punjabi filmmakers on the role of AI in filmmaking and their view on its potential impact on enhancing creativity, production efficiency, audience engagement, and competitiveness in the film industry while maintaining the authenticity of the films.

3.1 Research Questions

RQ1: What is the level of awareness and level of uptake of AI technologies by Punjabi film makers and producers?

RQ2: How does AI fit into the creative way of making Punjabi movies?

RQ3: Is the use of AI associated with enhanced production efficiency and cost management?

RQ4: How will AI affect audience interaction and competitiveness in the filmmaking landscape?

RQ5: Does cultural authenticity influence the receptiveness of filmmakers toward AI?

RQ6: What are the ethical concerns that Punjabi directors and producers have with AI?

3.2 Research Objectives

There are three related aims of this research. First, it assesses AI awareness, adoption, and influence in creative, production, and business processes, including efficiency, audience reach, and gaining a competitive edge in the Punjabi film industry. Second, it explores the stakeholder perceptions of authenticity and ethical concerns with the use of AI in production. Third, it creates an AI Adoption and Transformation Framework to contribute to the sustainable development of the Punjabi film industry.

3.3 Research Gap

The literature examined here has also shown that AI is transforming the global film value chain (Tsiavos and Kitsios, 2025), that regional cinemas are culturally recoding the stories of AI (Göker, 2025), and that questions of authorship and labour ethics in cinema, though significant in other high-tech sectors, have not yet been resolved (Broinowski and Martin, 2024). However, few studies do so focus on the individual experience of directors, producers and editors in a particular regional industry and look at how these tensions are manifested in practice. This research fills that void, based on in-depth interviews of practitioners, in which the terms of the negotiation between tradition and technology are created not by outside observers but by the industry itself.

3.4 Research Design

The research design used in this study is a qualitative approach with the method used is interview. Interviews were conducted with the directors and producers actively working in the Punjabi film industry. The interviews were based on the real-life constructs (RLCs) of specific AI production scenarios in filmmaking, such as AI-assisted scripting, visual effects, digital recreations of actors and analytics for audience targeting, to allow the participants to consider their own motivations, concerns, and expectations around the use of AI in filmmaking.

3.5 Methodology

This research is an exploratory, qualitative study to gain insight into the impact of AI on Punjabi cinema from the first-hand perspective of those who make it. Instead of trying to measure the subject of research, the design aims to understand the attitude and expectation of the filmmakers, what are the advantages, disadvantages, possibilities and risks of AI in Punjabi cinema. This topic is ideal for a qualitative approach as the impact of AI on Punjabi cinema is somewhat new and unpredictable, allowing for exploratory interviews where participants can provide their own experiences and reflections.

In-depth semi-structured interviews and open-ended question-and-answer sessions have been used to collect data, which were conducted in a setting that is comfortable for both the researcher and the participant, and help focus on five recurring themes: awareness and use of AI, creative

transformation, cultural and production implications, ethical considerations, and the future of AI in Punjabi cinema.

The participants were selected by convenient sampling which involves the inclusion of those who are willing and known to the researcher/director or who can be easily contacted by the researcher/director namely the actors, singers, producers, directors of Punjabi cinema. This method is suitable, because the number of potential respondents is small and targeted, the time period of the study was short, and the respondents had limited access to industry experts, so that the opinions of those who are involved at different stages in the production of Punjabi film have been represented. Like any convenience sample from the author's personal network, the conclusions reached have been interpreted as an exploratory report of the opinions of the professionals interviewed, and not as representative of the opinions of all Punjabi film professionals.

4. Conceptual and Analytical Framework

This study's conceptual framework assumes that adopting AI is the independent variable while the four outcomes -- creative transformation, production efficiency, audience engagement, and market competitiveness -- are the dependent variables, with cultural authenticity and ethical awareness as moderating variables to influence the strength of AI adoption's impact on these outcomes. In this framework, as outlined in Figure 1, the impact of AI on Punjabi cinema is not immediate and straightforward; it is mediated by the cultural values and moral considerations of the industry.

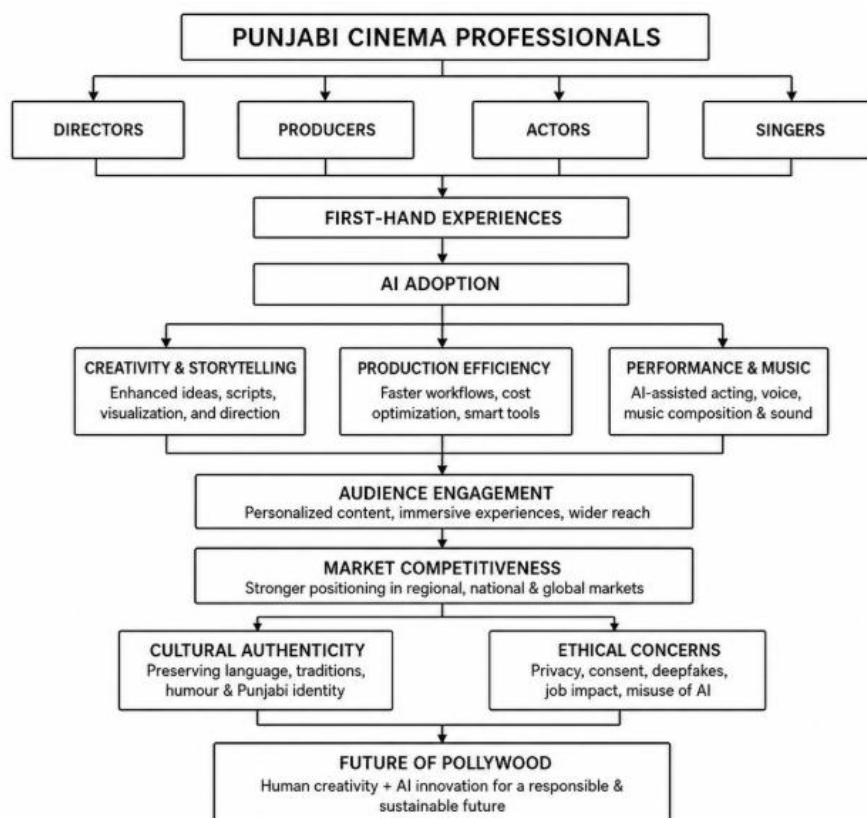


Figure 1. Conceptual framework linking AI adoption to creative, production, audience, and market outcomes, moderated by cultural authenticity and ethical concerns (author compilation).

Due to the qualitative nature of the first-hand data gathered from the study, participant responses will not be analysed statistically, but rather thematically. Thematic analysis is a flexible method for identifying, analysing and reporting patterns in qualitative data (Braun and Clarke, 2006) which is suitable for the discovery of themes that emerge from the accounts of various participants. The process of analysis will follow 6 stages as shown in Figure 2, namely familiarisation with the data, initial coding, searching for themes and development of themes, review of themes, defining and naming themes, and interpretation and write-up.



Figure 2. The six-stage thematic analysis process to be applied to interview data (adapted from Braun and Clarke, 2006).

4.1 The trustworthiness of the qualitative study

Credibility, dependability, confirmability and transferability (Lincoln and Guba, 1985) have been used to show the qualitative rigour of the study. Comparing responses between directors, producers, actors and singers will enhance the credibility of the responses; a consistent interview schedule and systematic coding process will support the dependability of the responses; the interview records will support the confirmability of the responses, and a clear separation of the participants' statements and the researcher's interpretation will enhance transferability, and sufficient contextual detail of participants and the Punjabi film industry will address transferability.

The results are viewed carefully since it has been convenience to interact personally to collect sample of Punjabi film makers. They have been interviewed to provide details that can be easily understood as a perspective-exploring narrative of the opinions of those particular professionals who participate in the study.

5. AI and the Transformation of Punjabi Filmmaking

Exploring how AI transformation is influencing Punjabi films from both the director and producer's point of view, this section will cover creative decision-making, production efficiency, cost management, cultural representation, audience engagement, and market competitiveness. The analytical framework aims to view the adoption of AI as the independent variable, creative transformation as the first dependent variable, production efficiency as the second dependent variable, audience engagement as the third dependent variable, and market competitiveness as the fourth dependent variable, with cultural authenticity and ethical awareness as moderating variables. The study suggests that instead of being considered a threat, AI can be a catalyst in creating a new era of creative and commercial success for Punjabi cinema if it is adopted within a framework that empowers filmmakers and producers without replacing them.

AI has become a part of the filmmaking pipeline and is being increasingly utilized. During the pre-production phase, AI can assist with story development, script analysis, scheduling, budgeting and location planning. Computational tools are used during production for cinematographic planning, virtual production, image generation, and visual effects. Post-production applications involve editing, restoration, dubbing, subtitling, sound enhancement and image manipulation. In fact, AI research has become increasingly important in the field of cinematography production, especially in the areas of automated and intelligent image acquisition and film construction, which is now beginning to enter the Punjabi film industry in the form of AI-assisted scriptwriting, de-aging and VFX, music generation based on AI, cross-lingual dubbing using deep fakes, audience targeting using algorithms, and intelligent casting decisions based on AI (Azzarelli, Anantrasirichai and Bull, 2025).

This transition gives rise to a central paradox about the lived experiences and cultural specificity that make up Punjabi cinema and the tools designed for scale, speed and optimisation based on data. Meanwhile, AI could provide a legitimate avenue for the production of value for under-resourced Punjab filmmakers, whose budgets are typically much lower than those of Bollywood and international studios, and still maintain the sense of authenticity from the region (Khan et al., 2025). The paper discusses the ways in which these key cultural values – community storytelling, musical heritage, dialectal authenticity, and diasporic connection – are being sustained, negotiated, or altered by the integration of AI tools into the creative and industrial processes, and what implications this might have for the preservation of traditional arts, like dialogue writing, folk music, and practical effects.

5.1 Director's Perspective: AI as Creative Enhancement

As the creative linchpin in bringing a story to the screen, AI should be considered as an aid to creativity, not a tool for replacing human expertise. AI can help directors in a variety of ways, including providing alternative visualizations, story development and script analysis, initial visualisations for scenes, and some elements of production planning. The intelligent cinematographic system can significantly save time on repetitive technical activities and provide new visual alternatives for experimentation (Azzarelli, Anantrasirichai and Bull, 2025).

For Punjabi directors, however, the practical application of these tools needs to be balanced with the creative vision. AI can help a director to brainstorm ideas for a scene, create a visual image, explore different styles, and more, but the director should still have a firm grasp of the final work's meaning and cultural presentation. Therefore, AI is best viewed as a collaborator rather than a

replacement for human authorship: while the director still has a final say on artistic vision, plot, and cultural fidelity, AI helps to infuse the process with a new dimension.

5.2 Producer's Perspective: Costs, Efficiency, Risks and Yields

Directors are more interested in the creative potential AI offers, while producers are more inclined to consider cost-benefit analysis. The cost of film production is very high, and many film producers are interested in cutting production costs to gain a competitive edge for their films. When considering the use of AI in film production, cost reduction is the main concern, with the aim of achieving the shortest possible production time without sacrificing quality. This line of reasoning can be formulated as a testable hypothesis, that is, use of AI for production efficiency will increase the production value and/or competitiveness in the market for Punjabi cinema. This hypothesis is shared by producers in their efforts to allocate scarce resources while meeting tight deadlines, yet create work that resonates with local and international audiences.

5.3 AI and Creative Transformation

AI tools can be used to quickly experiment with images and scene compositions, while the literature listed above on deep learning techniques outlines technologies that can support human work in areas such as scriptwriting, video editing, and score composition. In practical terms, this allows AI to contribute to the initial ideation of films and series without taking control of the creative process. In the real world, this can help create initial concepts for films and series while preserving control over the overall project. For Punjabi directors this provides an avenue to speed up production and discover new avenues of creativity such as experimenting with visual media, working on story ideas, picturing scenes, character design, alternative endings, translating the same content in multiple languages, salvaging old footage, or adding special effects.

None of which is of any way undermining the core of cultural authenticity in Punjabi cinema. While AI's ability to create ideas and visuals is crucial, real creative transformation will only happen when producers and directors employ these tools as instruments to their own artistic and cultural vision, not the other way around.

5.4 AI and Production Efficiency

Production efficiency is the ease with which a film is produced, with the aim of spending the least possible time, money and manpower to produce the film. AI has the potential for efficiency in repetitive tasks, assisting in casting choices, location planning, and editing, and the literature shows that one of the most apparent advantages of incorporating AI into Punjabi cinema is efficiency in processes (Khan et al., 2025). This efficiency is particularly useful for Punjabi producers dealing with a competitive regional market, as AI can handle editing, adding special effects, or dubbing, which would be costly and time-consuming in a traditional setting. Importantly, efficiency should be assessed not just in monetary terms, but also in terms of being creative and flexible enough to be able to rework, make new iterations and variations, and not be rigidly contained by one production formula.

So, AI can be a part of marketing as well as it can identify which platform is the best for the promotion, know the preference of the audiences and also can help in subtitling and dubbing of Punjabi films that can make Punjabi cinema and culture accessible to audiences outside the Indian

subcontinent. Such possibilities are only realised, however, if the film in question is able to attract and engage an audience.

5.5 AI as a great addition to the platform

AI is also revolutionizing the connection between Punjabis and film. AI is also making a mark on the connection between the Punjab is and film. With audience analytics, producers can discover their audience's likes, dislikes and discover which genres appeal to specific segments, as well as gauge audience reaction to promotional pieces. In the context of Punjabi cinema, this is a unique chance to reach out to the Punjabi community in the diaspora, as AI can help localise content, making it accessible to audiences with different levels of fluency in the Punjabi language. This underpins a second argument: With the advancement of AI-driven audience analysis, punjabi cinema will become more competitive in the market.

But competitiveness is dependent on both supply and demand, and producers need to understand that creative recommendations can be made equally algorithmically, replacing one set of decision makers with another (human directors with predictive algorithms). Thomas and Johnson (2026) warn that predictive analytics can become an anathema to cultural authenticity because they can drive the producers focus on market outcomes instead of artistry and lived human experience. According to the Ormax Box Office Report 2025, the box-office collections of Punjabi language films had fallen drastically in 2025 as compared to 2024, which accentuates the need to adopt more efficient production processes, smart targeting of the audience, and diversified income streams for filmmakers (Thomas and Johnson, 2026).

6. Cultural Authenticity and Ethical Constraints

The connection between Punjabi cinema and AI is significantly influenced by cultural authenticity. It is one of the most important features of Punjabi cinema and has differentiated it from other film making traditions; it is all about language, music, dance, food, social and family life, migration and the overall Punjabi culture. So, it's safe to assume that cultural authenticity will influence how much Punjabi directors and producers will use AI technologies.

Existing literature indicates that the current state of the art in reproducing cultural authenticity is not high, either due to the lack of cultural awareness or due to the risk of stereotype and homogenization of cultural expression. A similar argument is raised at the international level by Khattak, Cohen and Taylor (2025), who warn researchers and practitioners to be mindful of cultural authenticity in the application of AI to film, as AI can generate existing stereotypes without recognizing the human creators who created the cultural artefacts. Consequently, the link between Punjabi cinema and AI, in general, is likely to be moderated by cultural authenticity.

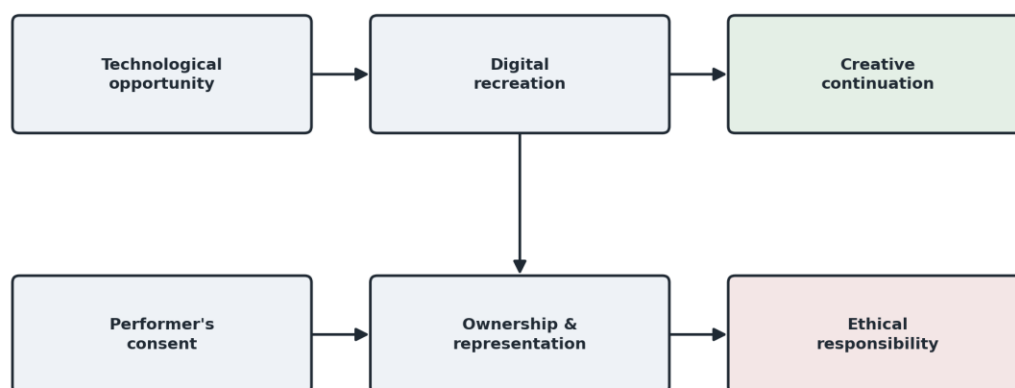
This worry is particularly prominent at the language level. An AI system can generate grammatically correct Punjabi sentences without capturing nuances, dialects, cultural meanings, and context-specific humor, potentially leading to a more generic form of the language when relying heavily on AI. However, this research will examine whether the directors and producers believe that AI is aiding the cultural authenticity or denying it, and is the main concept on the

premise that AIs should be given cultural supervision as Punjabi film makers know its nuances far better than any technological system will be able to in the near future.

6.1 The Jaswinder Bhalla Case: A New Ethical Dimension

AI, CGI, and VFX's recreations of Jaswinder Bhalla in Carry On Jatta 4 provide a real-life example of the moral conundrums of the era of AI in cinema. The recreations of Jaswinder Bhalla in Carry On Jatta 4 using AI, CGI, and VFX illustrate the practical applications of such technologies in the realm of movie production. Bhalla died before the shooting of the film was finished, and the production crew had a large amount of footage of Bhalla that had already been recorded. The new film, Cinema Express (2026), tells of the production's use of this older footage to create a digitally faithful portrait of the actor, which showcases the creative promise of the technology and the ethical concerns it raises.

The case can be viewed as two parallel lines: an easy going line of technological opportunity, digital recreation and creative continuation, and an accountability line which starts with the consent of the performer, moves to issues of ownership and representation, and ends with ethical issues. Both approaches come to the same point of interest – the virtual recreation of a passed on entertainer – which makes this case a valuable starting point for the empirical investigation proposed here and being able to watch whether Punjabi film makers consider this innovation as an imaginative chance or something that demands weighty control.



Both pathways converge on the same underlying event: digital recreation of a deceased performer

Figure 3. Two intersecting pathways in the Jaswinder Bhalla case: the creative-opportunity chain and the accountability chain, converging on the act of digital recreation.

6.2 Ethical and Legal Issues

This case study highlights a series of ethical and legal questions that arise when using AI in filmmaking. The right to digital recreation, as well as consent to access a person's image, voice and performance data, is a critical issue for both performers and their inheritors, and an issue that arises when the studio wants to use the likeness of a deceased performer, whether it's the family, the producers or a third party. AI-generated works also raise copyright and ownership concerns, as AI is required to be trained on a vast amount of existing media to produce new work. Last, but not least, there is the job market issue stemming from the increasing automation brought by AI into the film industry, affecting roles such as film editors, designers, and others involved in repetitive tasks. As the Indian film industry already faces ethical dilemmas regarding the use of AI and its potential impact on the future of cinema, it has drawn the attention of scholars in the context of the debates on authorship, employment, and cultural governance of AI produced content (Islam, 2022).

However, the issue of ethics is significant in the context of Punjabi cinema as the industry and the audience are highly conscious of cultural authenticity and traditional values. The problem is not one of banning the use of AI tools in Punjabi films, but rather establishing a framework that minimizes AI's impact while maintaining transparency, informed consent, the continuous human role, and accountability. The issue is not about banning the use of AI tools in Punjabi films, but rather about creating a framework that will minimize the impact of AI on films while upholding transparency, informed consent, sustained human participation, and clear lines of accountability – including consent to personal data usage, licensing policy, disclosure practices, and ethical guidelines for employees. In this capacity, AI can be used to pre-visualise a film with imagery or video, aid in a more flexible and experimental design process, especially for productions with constrained budgets, and, importantly, isn't an agent, it's a tool used by people to achieve their own creative vision.

7. Expected Contribution

Most of the Punjabi directors and producers are expected to find that AI is a tool used to strengthen the human creative process, and not to replace it, as indicated by the preliminary data that indicates that the utilization of AI in filmmaking seems to further the creative process rather than to remove the contribution of the human creative voice (Khan et al., 2025). AI tools are more likely to be integrated into the day-to-day workflow of directors and producers, in areas like editing, adding special effects, subtitles translation, restoring film negatives, production organisation and marketing, rather than core creative aspects like scriptwriting or acting, which require emotional involvement and cultural knowledge.

This would indicate that Punjabi cinema is integrating AI as a tool that supports rather than supplants human creativity, upholding a human-centered approach where AI is used more as a complementary tool. For instance, Carry On Jatta 4 is a good example of how AI extended its story and enabled the production to proceed without a key actor, yet retained human abilities to ensure emotional depth and cultural authenticity (Cinema Express, 2026; The Indian Express, 2026). Meanwhile, the ethical problems of digitally recreating the image and voice of a dead actor are as

pertinent as ever and must continue to serve as a guide for future Punjabi filmmakers when they make use of similar technology.

8. Implications for Punjabi Film Industry

This study's results could be beneficial for identifying various stakeholders in the Punjabi film industry and their potential gains from the implementation of AI, as each stakeholder group has unique needs, concerns, and expectations. AI will give directors who are more AI-literate the ability to experiment with visual effects and storytelling techniques without significantly disrupting their creative workflow, and producers can utilise AI to streamline distribution and promotional plans and minimise expenses. On the organisational level, production houses can create a specific AI policy for digital reproduction and tackle ethical issues raised in the study; film schools can add AI literacy to the Pollywood film education courses as a new creative tool; and the policymakers can use the study's results to identify the needs and opportunities of regional-language cinema.

The study is specifically anticipated to show the benefits the Punjabi community can get from their own technological awareness, the importance of AI-based solutions for regional film-making, and the need for the Punjabi community to continue championing the ethical and cultural values of Punjabi films. The Carry On Jatta 4 case study from Smeep Kang and Humble Motion Pictures, with digitally reconstructed performer, is an apt and real-life example of what the possibilities and dilemmas of AI adoption are for the Pollywood filmmakers.

9. Conclusion

The purpose of this qualitative research is to understand the evolving influence of Artificial Intelligence in Punjabi cinema, specifically in the creative process, production, performance, music composition and promotion of films. The study does not focus on how to operationalise and measure technology adoption, but rather on the stories of the people who are actually working through this transition.

The research is based on convenience sampling and first-hand accounts from Punjabi directors, producers, actors and singers, and will explore trends and contradictions that are only evident in the experiences of those actually using AI in their filmmaking, in order to draw conclusions on how production uses of AI are mainly perceived as an opportunity to create, a necessity, an ethical challenge, or some combination of all three. The analysis reveal that even if technology is a factor, it will not be the sole determinant in defining the future of Punjabi cinema, but the creative, professional and cultural capital of the filmmakers will play a role as well (Khan et al., 2025; Azzarelli, Anantrasirichai and Bull, 2025).

The Carry On Jatta 4 case also illustrates how AI visual effects and digital recreation can spark creative and ethical sparks in Punjabi films, while Indian production giants like T-Series are exploring AI animation tools further highlights the transformative impact of computer-generated imagery on the movies industry, promising to drive innovation and challenge conventional filmmaking methods. Despite this, Punjabi cinema's transformation does not need to be seen as the technology being the replacement for human creativity. Rather, the future of Punjabi cinema is not just about the technical prowess of AI but also about the professional and cultural expertise of the local film industry, which will be the ones to utilize it. Instead, it's not just about the technical

advancement of AI but also the cultural and professional competence of the local film industry that harnesses it. Within Pollywood, filmmakers can use generative AI tools to enhance their creative control, improve production value and connect with new audiences while maintaining the unique attributes that make Punjabi films distinct their language, culture, creativity and sentiments.

10. Findings

Directors and producers have varying levels of awareness and use of AI, from being experimenting with it, to actively using it in pre-production, production, and post-production. While stakeholders believe that AI usage improves production efficiency and the engagement of the audience, they are worried about the loss of cultural authenticity and ethical issues, including the use of AI to reanimate dead actors and the fear of traditional creative jobs being replaced by AI. Results indicate that the adoption is determined by a balance between technological opportunity and industrial cultural identity in the region.

11. Originality value

It is a pioneering study that focuses on the context of Indian Punjabi film industry and the level of AI adoption in that industry, which receives less attention in the existing AI and film literature, where the majority of the attention is given to the Hollywood context and the global case studies. The study's RLCs, based on real industry scenarios, provide a foundation for an AI Adoption and Transformation Framework for the sustainable growth of Punjabi cinema and how it has implications for policy makers, industry stakeholders, and filmmakers in the context of the cultural and ethical concerns of AI.

References

1. Anandraj, K.C. and Aravind, S. (2023) 'The impact of AI revolution in transforming film making industry for the digital age', *ILIS Journal of Librarianship and Informatics*, 6(2), pp. 82–91.
2. Azzarelli, A., Anantrasirichai, N. and Bull, D.R. (2025) 'Intelligent cinematography: a review of AI research for cinematographic production', *Artificial Intelligence Review*, 58, 108. Available at: <https://doi.org/10.1007/s10462-024-11089-3>.
3. Bender, S. (2025) 'Generative-AI, the media industries, and the disappearance of human creative labour', *Media Practice and Education*, 26(2), pp. 200–217. Available at: <https://doi.org/10.1080/25741136.2024.2355597>.
4. Broinowski, A. and Martin, F.R. (2024) 'Beyond the deepfake problem: benefits, risks and regulation of generative AI screen technologies', *Media International Australia*. Available at: <https://doi.org/10.1177/1329878X241288034>.
5. Cao, Y., Wang, F. and Xu, J. (2022) 'Deep learning in visual aesthetics: a survey on approaches and applications', *IEEE Transactions on Pattern Analysis and Machine*

- Intelligence*, 44(8), pp. 5061–5086. Available at: <https://doi.org/10.1109/TPAMI.2021.3092468>.
6. Chow, P.-S. (2020) 'Ghost in the (Hollywood) machine: emergent applications of artificial intelligence in the film industry', *NECSUS_European Journal of Media Studies*, 9(1), pp. 193–214. Available at: https://doi.org/10.1386/necsus_00029_1.
7. Cinema Express (2026) 'Carry On Jatta 4 recreates Jaswinder Bhalla with technology', 19 March. Available at: <https://www.cinemaexpress.com/amp/story/international/news/2026/Mar/19/carry-on-jatta-4-recreates-jaswinder-bhalla-with-technology> (Accessed: 19 March 2026)
8. Crawford, K. (2021) *Atlas of AI: power, politics, and the planetary costs of artificial intelligence*. New Haven: Yale University Press.
9. Danesi, M. (2024) 'AI-generated cinema', in *AI-Generated Popular Culture: A Semiotic Perspective*. Cham: Springer Nature Switzerland, pp. 45–65. Available at: <https://doi.org/10.1007/978-3-031-54752-2>.
10. Elson, D.K. and Wang, P. (2023) 'Computational models for cinematic style transfer', *ACM Transactions on Graphics*, 42(4), Article 67. Available at: <https://doi.org/10.1145/3599282>.
11. Entertainment Computing (2026) 'A systematic review for 2019–2025 on deep learning models in the film production industry', *Entertainment Computing*, 56, 101076. Available at: <https://doi.org/10.1016/j.entcom.2025.101076>.
12. Gao, Q. and Lee, D. (2021) 'AI and narrative: affective modelling for film analysis', *IEEE Transactions on Affective Computing*, 12(3), pp. 845–857. Available at: <https://doi.org/10.1109/TAFFC.2020.3014350>.
13. Gillespie, T., Boczkowski, P.J. and Foot, K.A. (2018) *Media technologies: essays on communication, materiality, and society*. Cambridge, MA: MIT Press.
14. Goel, G. (2024) 'Exploring the impact of AI in film pre-production in 2024', *Studioity Blog*, 12 May. Available at: <https://blog.studioity.com/exploring-the-impact-of-ai-in-film-pre-production-in-2024/> (Accessed: 12 May 2024).
15. Göker, D. (2025) 'Human-like artificial intelligence in Indian cinema: cultural narratives, ethical dimensions, and posthuman perspectives', *International Journal of Cultural and Social Studies (IntJCSS)*, 11(2), pp. 1–10. Available at: <https://doi.org/10.46442/intjcss.1799907>.
16. Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., Courville, A. and Bengio, Y. (2014) 'Generative adversarial nets', in *Proceedings of the 27th Conference on Neural Information Processing Systems (NIPS 2014)*. pp. 2672–2680. Available at: <https://doi.org/10.5555/2969033.2969125>.
17. Haidemariam, T. (2026) 'After generative AI: authorship, labour, and cultural governance', *AI & SOCIETY*. Available at: <https://link.springer.com/article/10.1007/s00146-026-03189-1>.
18. Han, J. and Shao, L. (2022) 'Study film and television postproduction and innovation strategy based on an artificial intelligence algorithm', *Mobile Information Systems*, 2022, pp. 1–11. Available at: <https://doi.org/10.1155/2022/3084493>.
19. Haqqi, F.U.D., Khan, M.K.S. and Naveed, S. (2025) 'Reimagining Pakistani cinema: the role of artificial intelligence and digital innovation in shaping the industry's future', *Insights*:

- Journal of Humanities and Media Studies Review*, 1(2), pp. 14–31. Available at: <https://doi.org/10.63290/jhmsr.v1i2.23>.
20. Huang, Z. and Liu, X. (2021) 'Interactive storytelling and AI-driven narratives: enhancing cinematic experiences through data analytics', *Journal of Interactive Media*, 15(4), pp. 221–239. Available at: <https://doi.org/10.1108/JIM-11-2021-00445>.
21. Islam, M.M. (2022) 'Artificial intelligence in Indian films: Anukul and AI ethics', *Short Film Studies*, 12(2), pp. 183–192. Available at: https://doi.org/10.1386/sfs_00082_1.
22. Khan, S.U., Khan, S., Ballewar, S.S., Rane, J.P. and Siddiquee, A.Q. (2025) 'Cinema and artificial intelligence: charting its role in the Indian film sector', in *Transforming Cinema with Artificial Intelligence*. Hershey, PA: IGI Global, pp. 144–179. Available at: <https://doi.org/10.4018/979-8-3693-3916-9.ch007>.
23. Khattak, M., Cohen, S.E. and Taylor, K. (2025) 'Who holds the camera? Filmmaking justice in the era of generative AI', *Global Review of AI Community Ethics*, 3(1). Available at: <https://doi.org/10.60690/7qv2j005>.
24. Li, H., Chen, J. and Zhou, T. (2023) 'Personalized cinema: AI and the future of tailored film experiences', *Journal of AI and Culture*, 19(2), pp. 112–130. Available at: <https://doi.org/10.1093/jac/2023.0157>.
25. Liu, J. (2024) 'Analysis of the impact of AI editing on film and television post-production in digital transformation', *Applied Mathematics and Nonlinear Sciences*, 9(1). Available at: <https://doi.org/10.2478/amns-2024-2424>.
26. Mehta, M. and Mukherjee, M. (eds.) (2021) *Industrial networks and cinemas of India: shooting stars, shifting geographies and multiplying media*. Abingdon: Routledge.
27. Pradeep, A., Satmurotov, A., Yeshbayev, I., Khasan, O., Iqboljon, M. and Daniyov, A. (2023) 'The significance of artificial intelligence in contemporary cinema', in *2023 2nd International Conference on Trends in Electrical, Electronics, and Computer Engineering (TEECCON)*. IEEE, pp. 111–116. Available at: <https://doi.org/10.1109/TEECCON59234.2023.10335867>.
28. Raffel, C., Shazeer, N., Roberts, A., Lee, K., Narang, S., Matena, M., Zhou, Y., Li, W. and Liu, P.J. (2020) 'Exploring the limits of transfer learning with a unified text-to-text transformer', *Journal of Machine Learning Research*, 21(140), pp. 1–67. Available at: <https://doi.org/10.5555/3455716.3455732>.
29. Rogers, E.M. (2003) *Diffusion of innovations*. 5th edn. New York: Free Press.
30. Singh, H., Rastogi, A. and Kaur, K. (2023) 'Artificial intelligence as a tool in the visual effects and film industry', in *Recent Advances in Computing Sciences*. 1st edn. Boca Raton: CRC Press, pp. 312–316. Available at: <https://doi.org/10.1201/9781003405573>.
31. Song, Q. and Wook, Y.S. (2020) 'Exploration of the application of virtual reality and internet of things in film and television production mode', *Applied Sciences*, 10(10), 3450. Available at: <https://doi.org/10.3390/app10103450>.
32. Sun, P. (2024) 'A study of artificial intelligence in the production of film', in *SHS Web of Conferences*. EDP Sciences. Available at: <https://doi.org/10.1051/shsconf/202418303004>.
33. Sun, Y., Duan, Y. and Zhang, T. (2025) 'Affective AI and film audience analytics: trends and challenges', *IEEE MultiMedia*, 32(1), pp. 23–35. Available at: <https://doi.org/10.1109/MMUL.2024.3127758>.

34. The Indian Express (2026) 'Carry on Jatta 4 recreates late Jaswinder Bhalla using AI: "People suggested replacements"', 16 June. Available at: <https://indianexpress.com/article/entertainment/regional/carry-on-jatta-4-recreates-late-jaswinder-bhalla-using-ai-10742356/> (Accessed: 16 June 2026).
35. Thomas, S. and Johnson, J. (2026) 'Rewriting authenticity: cinema in the grip of digital prediction', *Frontiers in Communication*, 11. Available at: <https://doi.org/10.3389/fcomm.2026.1687526>.
36. Tsiavos, V. and Kitsios, F. (2025) 'The digital transformation of the film industry: how artificial intelligence is changing the seventh art', *Telecommunications Policy*, 49(8), 103021. Available at: <https://doi.org/10.1016/j.telpol.2025.103021>.
37. Uddin, S.M.I., Sumon, R.I., Mozumder, M.A.I., Chowdhury, M.K.H., Armand, T.P.T. and Kim, H.C. (2025) 'Innovations and challenges of AI in film: a methodological framework for future exploration', *ACM Transactions on Multimedia Computing, Communications, and Applications*, 21(7), Article 199.
38. Valdivia Alonso, D. (2026) 'Imagining AI futures in mainstream cinema: socio-technical narratives and social imaginaries', *AI & SOCIETY*, 41, pp. 6125–6135. Available at: <https://link.springer.com/article/10.1007/s00146-026-02880-7>.
39. Wang, B. (2025) 'Diffusion-based visual art creation: a survey and new perspectives', *ACM Transactions on Graphics*, 44(1), Article 12. Available at: <https://doi.org/10.1145/3728459>.
40. Wang, J., Huang, X., Yang, Z. and Zhao, W. (2023) 'Construction of artificial intelligence generated content in digital film production', in *2023 IEEE 22nd International Conference on Trust, Security and Privacy in Computing and Communications (TrustCom)*. IEEE, pp. 2621–2628. Available at: <https://doi.org/10.1109/TRUSTCOM60117.2023.00366>.