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MULTIMODAL DISCOURSE ANALYSIS OF VETERAN ACTORS' AI-BASED DE-AGED LOOK USING THE UNCANNY VALLEY EFFECT-A DEEP DIVE INTO AI REVOLUTION IN CINEMA

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ABSTRACT:

The research paper reviews the 'de aging technique'employed using Artificial Intelligence, used in both Hollywood and Indian film industry during recent years. It is a form of Visual Effects Technology (VFX) blended with AI, to modify into a 'younger version' of the chosen person, by smoothening out wrinkles, sagged skin, etc., by making them physically look 10 to 20 years younger. This technology was prominently used on older actors in Hollywood like Robert De Niro, Al Pacino, Will Smith, and so on, and this technology was adopted in Indian cinema as well, where older actors like Amitabh Bachchan, Shah Rukh Khan, Vijay, were also 'de aged' to look physically younger for their respective films. Therefore to study the deaging features of this revolutionary technology, the researcher adopts the multimodal discourse analysis approach, along with the phenomenon-Uncanny Valley Effect to study the changes in their facial features and to discover whether there are any discrepancies that make them look 'artificial' or 'unnatural' on-screen, by selecting particular scene from two Hollywood films and one pan-Indian film. It was concluded that though AI de-aging technology did make the actors' look younger, it did trigger the uncanny valley effect, in terms of unnatural facial features, slow body movements, and aged voices.

KEYWORDS: *AI De aging, Cinema, Uncanny Valley Effect, Hollywood, Indian Film Industry.*

1. INTRODUCTION

1.1. Meaning of film and its history

Film, or cinema is a type of visual arts medium, that uses pictures to project them in fast sequences using light, that creates an illusion on the viewers' minds that they are moving smoothly, and continuously, resulting in conveying unique stories and evoking emotions among the audience. The word 'film' is derived from the Old English word-filmen, standing for thin skin or membrane. As it is used to convey stories, it has been considered one of the popular forms of mass media, and is often combined with other aspects-sound effects, music, acting, screenplay, cinematography, and direction, to relay any thoughtful message, share fictitious or mythological stories, and to stir emotions to make the viewers lose themselves in the film.

In earlier days, filmmaking started off as a scientific process, when prominent English photographer-Eadweard Muybridge discovered the art of motion picture, where he used over 24 cameras to capture the rising of all horses'hooves while it galloped, now called in the world of cinemas as Horse in Motion. Later, in 1891, a device called Kinetoscope was designed by Thomas Edison and William Kennedy Dickson, which enabled one viewer at a time to view motion pictures through a peephole. In later stages, Lumiere Brothers developed a device called Cinematographe, that they used to capture moving people, and showcased to the general public as motion films.

1.2. Film movements across the world and rise of Indian cinema

During the 20th century, several positive strides were seen in the film industry, where various efforts were made to add sound, colour, and many western countries like France, Italy, Germany, had their own film movements like German Expressionism, Soviet Montage, French New Wave, and so on. However, USA's integration of leading technical aspects in filmmaking made their industry-Hollywood one of the leading producers of cinema.

India, despite under British rule, experienced filmmaking and cinema, as early as 1896 when the Lumiere brothers screened movies in the then Bombay, thus pioneering the advent of the Indian film industry. Dadasaheb Phalke, hailed as the father of Indian cinema, directed the first Indian silent film, 'Raja Harishchandra' in 1913. In 1931, the first sound or talkies movie "Alam Ara" directed by Ardeshir Irani was the first talkie film of Indian cinema, with beautiful songs, that captured the audience. In the later years post Indian independence stalwarts like Satyajit Ray, Bimal Roy made films portraying societal structures, the traditions, superstitions, giving the audience a new dimension of cinema. In the following years Indian cinema diversified into various Indian languages and based on the local language of each region, the industry came to be called Bollywood, Tollywood, Kollywood, Sandalwood, and so on, that birthed several legends like Raj Kapoor, Dilip Kumar, Dev Anand, N.T.Rama Rao, M.G.Ramachandran, Kishore Kumar, Mohammad Rafi, Lata Mangeshkar, and many more as the driving force behind the growth of Indian film industry.

1.3. Usage of AI in World Cinema

As filmmaking and the cinema industry is a constant evolving one in aspects of technology integration, story adoption, and inventing new story genres, it had adopted various technological features to revolutionise storytelling by integrating Computer-Generated Imagery (CGI), Augmented Reality (AR) and Virtual Reality (VR), 3D Printing, 3D Previsualization, and so on. In recent years, Artificial Intelligence (AI) has been adopted to film industry as well, by providing assistance in pre-production work like scriptwriting, and mostly on post-production work by its incorporation in CGI work, language translation, and for editing purposes too, with some notable examples being Star Wars, The Irishman, The Brutalist, and Emilia Perez, where it is being used to bring back dead actors' bodies, and their voices, to alter certain aspects of the film scenes, use popular algorithms for content generation, and even generate a full feature film using Generative AI.

1.4. Usage of AI in Indian film industry

Like other countries' film industries in adoption of technologies, the Indian film industry too is no stranger to embrace the technical and technological advancements to enhance and improve movie experience to the people. The digital revolution has transformed the analog methods to digital versions right from the scratch in film making and production to post production and final screening. Use of new and improvised tools and equipment that save time, energy and cost effectiveness have been used for quite a while that transform the viewing experience to a different level, with notable examples being Enthiran, Baahubali, Krrish 3, Jawan, and Raanjhanaa.

1.5. AI-based de aging and Uncanny Valley effect

As AI has the ability to alter portions in the film, it has been employed by the filmmakers to'deage' or reduce elderly facial features from the faces of yesteryear actors, in-tune with the flashback

scene. However, there has been some criticism from viewers and tech experts alike for looking at the deaged actors' look unrealistic and 'out of place', especially in films like the Irishman, where many older actors' faces were deaged, but were criticised for looking too unnatural in terms of body movements, artificial eye movements or mouth, that will be discussed in-depth by the researcher.

This event corroborates with the phenomenon-Uncanny Valley Effect, developed by Professor Masahiro Mori, from Tokyo Institute of Technology, who stated that the humanoid robots' utmost and imperfect resemblance of humans trigger feelings of unease, and eeriness, as the almost human look can cause discomfort on people's minds that the image or robot is not real.

2. REVIEW OF LITERATURE

2.1. Usage of Artificial Intelligence In Filmmaking

K.C. Anandraj & Dr. S. Aravind (2023) reviewed the impact of AI revolution in transforming the film industry by examining the diverse sections of AI-machine learning, computer vision, natural language processing (NLP), and Generative Adversarial Networks (GAN), and its influence in three aspects of filmmaking-pre-production, production, post-production, and audience engagement, and also discusses the relationship between technology and creativity in cinema. ***Kholod Abdel Nasar et.al (2025)*** analysed the historical evolution of artificial intelligence in cinema wherein the researchers used the descriptive approach in concluding that AI has evolved from an assistance tool to a fundamental partner in filmmaking, wherein it can save time and costs, and also open new horizons. However, the researchers also cautioned that proper management of AI must be undertaken to preserve creativity. ***Mohit Yadav et.al (2025)*** studied the future trends and impact of artificial intelligence in filmmaking, which covered the future trends and impact of AI in filmmaking, by conducting in-depth interviews with industry experts. It was concluded human judgement should never be hindered.

2.2. Advent of de aging technology in filmmaking

Christopher Holliday (2021) examined the process and impact of digital de-aging process, by analysing both its merits and demerits, which the researcher highlighted that it enhanced the performances of aged actors, however, delves into the discussions on computer-mediated aging and digital performance. ***Kathleen Loock (2021)*** studied the digital de-aging tool by labelling it ' controversial' in the aspect of digital realism by taking examples from two Hollywood films that used de-aging technology in full capacity-Gemini Man by director Ang Lee, starring Will Smith and The Irishman, by director Martin Scorsese, starring Robert De Niro, Al Pacino, and Joe Pesci. The researcher pointed out that despite Hollywood's efforts to digitally deage and resurrect younger versions of older actors, the uncanny difference was visibly seen during actors' aged movements, and the researcher also added that the viewers' memories towards the actors' faces also will add to the uncanny effect. ***A. Yudo Triartanto et. al (2023)*** employed the hypersemiotic method by Jean Baudrillard, to find out the relationship between simulations found in the Hollywood film-Indiana Jones and The Dial of Destiny, where digital de-aging technique was used to show a 'younger' version of legendary actor Harrison Ford.

2.3. Uncanny Valley Effect and human realism

Roger Moore (2012) studied the uncanny valley effect phenomenon, coined by Masahiro Mori in 1970, where things that resemble humans or their parts in any form, can trigger eeriness and discomfort feelings in some people's minds. In order to explain in detail this psychological phenomenon, the researcher has employed the Bayesian model of categorical perception. He later concluded that the Mori model states that humans group things/products, what they see as 'human' or 'non-human', but when features from both categories overlap, they get a distorted perception. ***Karl F. MacDorman & Debaleena Chattopadhyay (2016)*** analysed the relationship between the uncanny valley effect phenomenon and human realism, that appears realistic and lifelike, almost resembling a human. They later concluded that eeriness occurs not because humans consider something as human or

not human, but hinges on 'inconsistent realism', wherein creepiness arises when some parts of the face, especially if eyes and mouth are not looking correctly, it causes the eeriness and uncanny valley effect.

3. THEORETICAL FRAMEWORK

The research paper takes into account the Uncanny Valley Effect proposed by Professor Masahiro Mori, from Tokyo Institute of Technology, in 1970, who stated that the humanoid robots' utmost and imperfect resemblance of humans trigger feelings of unease, and eeriness, as the almost human look can cause discomfort on people's minds that the image or robot is not real. It is often associated with humanoid robots, AI-generated images, video game characters, and so on. The uncanny valley effect is often represented as a graph, where familiarity increases when it resembles a human, but drops negatively when it has a near-perfect human likeliness.

4. RESEARCH METHODOLOGY

The research paper has adopted the qualitative approach, especially the multimodal discourse method to analyse the scenes featuring the de-aged actors' facial features, body movements, surrounding visuals, voice, and the scene sequence present in the film. Also the researcher has planned to analyse the discrepancies found in the de-aged looks of the actors on-screen using the phenomenon-The Uncanny Valley Effect.

5. RESEARCH GAP

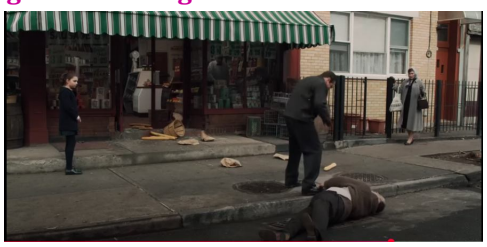
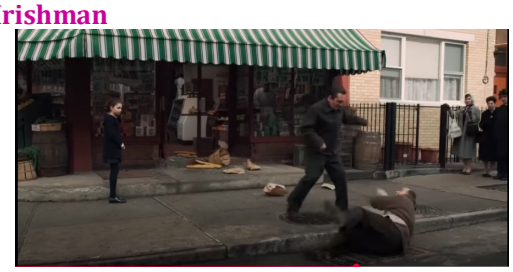
From analysing both national and international research journals, it was discovered that many papers highlighted the usage of AI in filmmaking, right from pre-production to post-production, and there were some international papers covering the usage of AI de-aging technology in mostly-talked about films that employed AI-The Irishman, Gemini Man, and so on. However, AI de-aging was used in Indian cinema as well, which the researcher will be covering, alongside Hollywood pictures. In addition, not many journals were found on the relationship between the uncanny valley effect and AI de-aged characters' visuals on-screen, where the theory states that uncanny valley effect often happens when the opposite object (humanoid robot or video game characters) have artificial looking eyes, mouth or unnatural body movements.

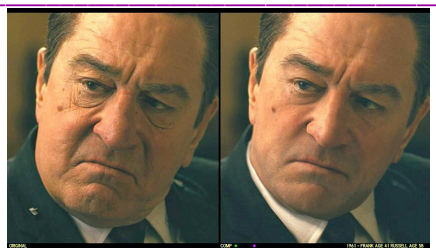
6. RESEARCH OBJECTIVES

1. To study the AI de-aging technology's features to achieve such de-aging effects on older actors.
2. To analyse the body posture, movements, and scene sequence, featuring the de-aging actor.
3. To review whether a de-aged look appears natural or synthetic, based on the Uncanny Valley effect's important feature-unnatural looking eyes and body movements.

7. ANALYSIS AND DISCUSSION

7.1. De-aged De Niro fight scene in the film-The Irishman

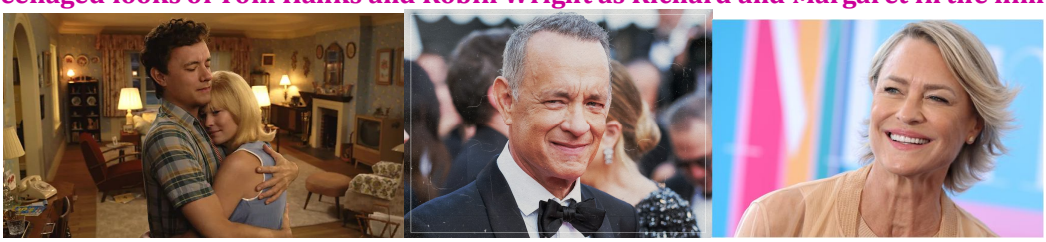





Discourse: The Irishman was a 2019 crime film, directed by veteran director Martin Scorsese, based out of a non-fiction book-I Heard You Paint Houses, that starred legendary Hollywood actors like Robert De Niro, Al Pacino, and Joe Pesci, winning awards at the 92nd Academy Awards, and 77th Golden Globe Awards. As the film showcases the life of a driver-turned-hitman, Frank Sheeran, played by Robert De Niro, spanning over six decades, the production company employed the digital de-aging technology to showcase the character's life journey, where most de-aging technology happens by digitally mapping the on-screen actors' movements with dots on their faces, and for tracking their body movements using special helmets or suits. However, with the veteran actors not being comfortable with wearing such technology while acting, director Martin Scorsese roped in a visual effects company-ILM, who used a three-camera rig for creating 3D models by capturing infrared data. Later, the data was processed using AI for transforming their faces to their younger selves, by running comparison data with the actors' original younger photos and videos.

In the particular scene where Frank Sheeran, played by Robert De Niro, (in his 30s), beat up the shopkeeper who pushed his daughter gives away the Uncanny Valley effect, in terms of unnatural body movements, as, when he was seen stomping and kicking the shopkeeper, his legs tend to move slow and looked stiff, looking completely unnatural for a 30 year old's body to be behaving like this. Since De Niro is a veteran actor in his 80s, and only his face looked younger, it was not convincing to accept him as a man in his 30s, vigorously showing violence.

7.2. Teenaged looks of Tom Hanks and Robin Wright as Richard and Margaret in the film-Here



Discourse: Here was a 2024 romantic film directed by legendary director Robert Zemeckis, starring veteran actors-Tom Hanks and Robin Wright as lead actors, reuniting together after a gap of 30 years since their pairing in the critically acclaimed film-Forrest Gump. This film shows the lead actors' journeys from their teenage years to their old selves, with many flashback scenes. Therefore, to showcase the leads' younger years, the director had roped in a visual effects company-Metaphysic, who used two monitors at the same time, where one showed their actual performances on-screen, and another their de-aged look, that was achieved by using their previous works, trained using machine learning.

Though the de-aging technique was widely appreciated, including Tom Hanks's wife Rita Wilson, who became emotional seeing the former's younger look, their voices sounded old, as scientific evidence states that human voices change due to aging of the larynx, which looked out of place during the teenage scenes, thus triggering uncanny valley effect.

7.3. Younger look of Amitabh Bachchan as Ashwattama in Mahabharat scene of the film-Kalki 2898 AD

Discourse: Kalki 2898 AD was a mythological-inspired sci-fi pan-Indian film, directed by Nag Ashwin, having a stellar cast-Amitabh Bachchan, Kamal Haasan, Prabhas, Deepika Padukone, Dulquer Salmaan, Vijay Devarkonda, Shobana, Disha Patani, and many more. The film had two time periods-one in the distant past where the great Kurukshetra war happens between cousins Pandavas and Kauravas and another one is set in the dystopian era 2898 AD, where the entire story delves around the prophecy and birth of the 10th and final avatar of Lord Vishnu, to defeat the evil king-Supreme Yaskin. Veteran actor Amitabh Bachchan played the role of both younger and older Ashwattama, son of sage Drona, and friends with Duryodhana, eldest brother of the Kauravas.

To portray a younger Ashwattama in the flashback scene, the actor's face was de-aged using CGI and AI, to modify how he looked in the 1970s and 80s. However, the actor's facial features, especially the eyes, looked bulged and cartoonish, while his movements looked unnatural, thus triggering an uncanny valley effect, especially in the scene where he utters the mantra to invoke Brahmastra, and his confrontation with Lord Krishna. Though Big B is widely known for his baritone voice, it sounded old during the flashback scenes, as the actor himself is in his 80s.

8. CONCLUSION AND RECOMMENDATIONS

With the advent of usage of AI tools and applications for filmmaking, it did not go well down in Hollywood where the prominent actors' union, SAG-AFTRA conducted a huge strike for over six months during the year 2023, stalling many productions, where they demanded better compensation and protection from being replaced by AI applications, and finally a consensus was reached and a new agreement was drafted. According to prominent author, and tech geek, Mayukh Mukhopadhyay, while he felt that AI de-aging of veteran actors looked exciting, he feared that it might erode the nostalgic feeling and remove our reminiscences of veteran actors in their early years, if this technology is used more often in mainstream cinema.

However, the Indian film industry has embraced AI tools, especially the de-aging technology with open arms, with notable examples of the famous Kannada director and producer MG Srinivas using AI de-aging tools to de-age Kannada actor Shiva Rajkumar for a 2023 film-Ghost. He stated that he got excited about de-aging when he first saw the de-aged look of actor Will Smith in the film Gemini Man, and has also expressed his eagerness to resurrect yesteryear actors-N.T. Rama Rao, and Puneeth Rajkumar for their fans.

The above analysed scenes from film aids in drawing conclusion that AI de-aging is a revolutionary technology, but still has a long way to go to attain perfection in all aspects, to avoid the uncanny valley effect, as AI is here to stay and revolutionise the cinema field since the era of talkies.

9. REFERENCES AND BIBILIOGRAPHY

1. Swarnakar, S. (2024). Artificial Intelligence and Cinema-Exploring the Implications of Artificial Intelligence in Cinema. *The Media Mosaic: Exploring Diverse Artistic Forms*, 21-26.
2. Hassan, K. A. N., Ewis, K. A., & Kamel, M. H. (2025). The Historical Evolution of Artificial Intelligence Technology in Cinema. *International Design Journal*, *15*(3), 485-488.

3. Ali, M. A., & Butt, A. A. Artificial Intelligence and Indian Cinema. *Media and Al: Navigating*, 19.
4. Yadav, M., Mishra, D., & Jayarathne, P. A. (2025). Lights, Camera, AI: The Future Trends and Impacts of Artificial Intelligence in Filmmaking. In *Transforming Cinema with Artificial Intelligence* (pp. 1-14). IGI Global Scientific Publishing.
5. Anandraj, K. C., & 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), 82-91. **(good paper real life examples of ai used in films)**
6. Uddin, S. M. I., Sumon, R. I., Islam Mozumder, M. A., Hussin Chowdhury, M. K., Theodore Armand, T. P., & 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), 1-55.**(formalism, narrative theory, and auteur theory-can be used)**
7. Izani, M., Rehab, D., & Razak, A. (2025). Reel to Real: Unveiling the AI Revolution in Filmmaking. In *Innovative and Intelligent Digital Technologies; Towards an Increased Efficiency: Volume 2* (pp. 723-735). Cham: Springer Nature Switzerland.
8. Seyama, J. I., & Nagayama, R. S. (2007). The uncanny valley: Effect of realism on the impression of artificial human faces. *Presence*, *16*(4), 337-351.
9. Holliday, C. (2021). Retroframing the Future: Digital De-aging Technologies in Contemporary Hollywood Cinema. *JCMS: Journal of Cinema and Media Studies 61*(5), 210-237. https://dx.doi.org/10.1353/cj.2021.a922658.
10. Loock, K. (2021). On the realist aesthetics of digital de-aging in contemporary Hollywood cinema. *Orbis Litterarum*, *76*(4), 214-225.
11. Triartanto, A. Y., Mutiah, T., & Suriyanto, A. D. (2023). HIPER-SEMIOTIKA PADA FILM INDIANA JONES AND THE DIAL OF DESTINY MELALUI PENGGUNAAN TEKNOLOGI CGI DE-AGING. *NIVEDANA: Jurnal Komunikasi dan Bahasa*, *4*(2), 305-313.
12. Moore, R. K. (2012). A Bayesian explanation of the 'Uncanny Valley'effect and related psychological phenomena. *Scientific reports*, *2*(1), 864.
13. MacDorman, K. F., & Chattopadhyay, D. (2016). Reducing consistency in human realism increases the uncanny valley effect; increasing category uncertainty does not. *Cognition*, *146*, 190-205.
14. https://www.researchgate.net/publication/381232158_Artificial_Intelligence_and_Indian_Cinema
15. https://www.ibm.com/think/topics/artificial-intelligence
16. https://raindance.org/artificial-intelligence-and-filmmaking-threats-and-features/
17. https://www.bruegel.org/blog-post/dark-side-artificial-intelligence-manipulation-human-behaviour
18. https://thefederal.com/films/artificial-intelligence-ai-future-of-filmmaking-india-cinema-de-aging-182480
19. https://collider.com/best-worst-digital-de-aging-in-movies-ranked/
20. https://www.thedrum.com/news/2025/05/13/indian-filmmakers-are-embracing-ai-boldy-while-hollywood-playing-it-safe
21. https://smartclick.ai/articles/how-artificial-intelligence-is-used-in-the-film-industry/
22. https://www.croma.com/unboxed/here-movie-tom-hanks-robi-wright-de-aged-using-ai?srsltid=AfmBOop1e9XiUhIeNwgS1oCbsKa1Kaaf17onCf-7LN4ggp8t_HtFB-kS
23. https://www.theguardian.com/film/2023/feb/06/de-ageing-on-screen-ai-artificial-intelligence-film
24. https://www.instagram.com/p/DNZvo47pXDs/
25. https://theprint.in/feature/pouty-heroines-perfect-palaces-ai-prompts-are-building-new-age-films-in-india/2634538/