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# **An Exploratory Study on how Artificial Intelligence could help Resolve the Issue of Whitewashing Hollywood Films**

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# Sammanfattning

Whitewashing och colourism är utbredda fenomen i filmbranschen i Hollywood. Detta är en konsekvens av årtionden av institutionell rasism, omedvetna och indirekta fördomar hos branschfolk, i kombination med missuppfattningar om framgångsfaktorerna i filmer. Denna studie kommer att undersöka möjligheten att använda artificiell intelligens som ett hjälpmedel för professionella inom filmindustrin i Hollywood i kampen mot whitewashing. Forskningen av AI (artificiell intelligens) och AI-mänskliga interaktioner är ett relativt nytt fenomen, likaså att kombinera artificiell intelligens med den kreativa processen av att skapa en gjutning. Detta innebär att forskningen kring ämnet är ett relativt nytt område och kommer att undersökas ur en utforskande synvinkel. Resultatet av denna avhandling tyder på att användningen av AI som ett hjälpmedel kan resultera i mer varierande rollbesättningar, med bredare representation av färgade personer, men tekniken måste till att börja med möta och övervinna sina egna fördomar.

## Abstract

Whitewashing and colourism is prevalent in the Hollywood film industry due to decades of institutional racism, unconscious and implicit bias of professionals in the industry combined with the misconceptions of the success factors in film. This study will explore the capabilities of artificial intelligence helping the industry professionals of Hollywood film fight against whitewashing. The research of AI and AI-human interactions are a relatively young phenomenon, let alone combining artificial intelligence with the creative process of creating a cast. This means that the whole research is a relatively new territory and will be examined from an exploratory point of view. The findings of this paper suggest that AI certainly has the capabilities to help Hollywood make more diverse casts with more equal representation of people of colour, but technology needs to face and overcome the biases of its own first.

### Keywords

Racial minorities in film, whitewashing in film, colourism in media, diverse film casts, effects of whitewashing in film, artificial intelligence bias, bias film auditions, regulation of artificial intelligence

# An Exploratory Study on how Artificial Intelligence could help Resolve the Issue of Whitewashing Hollywood Films

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## ABSTRACT

Whitewashing and colourism is prevalent in the Hollywood film industry due to decades of institutional racism, unconscious and implicit bias of professionals in the industry combined with the misconceptions of the success factors in film. This study will explore the capabilities of artificial intelligence helping the industry professionals of Hollywood film fight against whitewashing. The research of AI and AI-human interactions are a relatively young phenomenon, let alone combining artificial intelligence with the creative process of creating a cast. This means that the whole research is a relatively new territory and will be examined from an exploratory point of view. The findings of this paper suggest that AI certainly has the capabilities to help Hollywood make more diverse casts with more equal representation of people of colour, but technology needs to face and overcome the biases of its own first.

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## INTRODUCTION

Minorities such as people with disabilities, the LGBT community, people of colour (POC), and women face discrimination in the Hollywood film industry both behind and in front of the camera [15,28]. The scope of this study is limited specifically to focus on whitewashing and colourism of casts, which affects people of colour in front of the camera meaning actors and actresses. Thus, when referring to minorities in this paper, it is referring to minorities of race.

The underrepresentation of different races and people of colour in mainstream media is upholding the societal structures of white supremacy making Whites more oblivious to the issues and pain POC have to face, and POC on the other hand are subtly told their appearance, way of speaking and even just their existence is not idealistic and desirable. Whitewashing and colourism, both being products of race discrimination in

the film entertainment industry, favour Whites over POC and decrease the opportunities of POC to appear on screen in leading roles.

Social structures, that support whitewashing and racism in the entertainment industry of Hollywood films, need to be changed so that the inequalities and unfair situations could be cut down to a minimum. Regardless of academic research, public discussion and movements against the unfair representation of POC on screen, the industry is still overpowered by Whites on both sides of the camera [15]. In order to create change in this context, the way people think, imagine and create stories need to be changed. If people have not achieved to make change thus far on their own, could artificial intelligence be taught and designed to help cut down bias and make the process towards a more diverse film industry faster and smoother for all parties involved? The subject will be explored through the research objective: *How could artificial intelligence help resolve the issue of whitewashing Hollywood film?*

## METHOD

Using technology to decrease whitewashing in casting is an area of research that has not been explored before. As such, this paper focuses on introducing this area through literature and examples from the real world in order to create an understanding of the subject. As an exploratory research, the objective is not to produce a conclusive result. The aim of this study is to open conversation on the possibility of using AI to decrease whitewashing and point out the possibilities and challenges that technology would have if it were to be developed to this context. Due to the lack of a conclusive result, this paper will introduce topics for future research that would take the research forward.

The paper will proceed as follows:

The background and overview of whitewashing as a phenomenon will be introduced, in addition to introducing the different biases that support the system of whitewashing and colourism in the Hollywood film industry. The research objective will be examined through related literature and real-life examples regarding how artificial intelligence has been implemented into corporate

recruitment and what pros and cons have emerged in those contexts in relation to casting for film. The discussion section will then explore the possibility as well as the capability of creating an AI tool to help industry professionals decrease whitewashing in their film casts, which are then followed by topic suggestions for future research.

## FINDINGS AND ANALYSIS

### Racial inequalities and whitewashing in Hollywood film casts

The phenomenon of Whites overrepresenting in film has acquired its own term: whitewashing. Whitewashing is a casting practice where White actors and actresses are casted for roles meant for people of colour. It can occur in any type of production, meaning that even an adaptation from an already existing story with a diverse set of characters are not safe from whitewashing. Clear examples can be taken from Marvel’s iconic comics, where one can clearly see the look of the original characters, which should not leave much room for whitewashing. In Marvel’s Doctor Strange *the Ancient One* is portrayed in the comic as a Mongolian monk, but in the film is played by British Tilda Swinton, who is white. Same as in Marc Miller’s and J. G. Jones’ comic *Wanted* one of the main characters is Fox, a black woman, but on screen she is played by Angelina Jolie, also white.

The United States Census Bureau estimates that in 2017 approximately 13.4% of the US population are Black or African-American (a person who has origins in any of the Black racial groups of Africa) [38]. This means that there are slightly over 40 million US citizens who identify themselves as Black or African American. The UCLA Hollywood Diversity Report 2018 [15] states that in 2016 nearly 40 % of the U. S. population consists of minorities and estimates that by 2050 minorities as a group will become the majority of the whole population of the U.S. This finding is backed up by a study by William H. Frey from the Brookings Institution based in Washington D.C. Frey estimates that the tipping point for Whites becoming a minority in specific age groups will come sooner than we think, and there already exists a generation where Whites are in the minority, when they are compared to other racial minorities as a whole.[10,11] “Generation Z-plus”, meaning children born since 2007, are the first generation to be only 46.7% White in the U.S. [11] This trend, where Whites against all other racial groups are a minority, will start from the youngest age groups and slowly move towards the older generations when generations start to pass away. Racial minorities are an ever-growing group and yet they are still underrepresented on mainstream Hollywood films. [15]

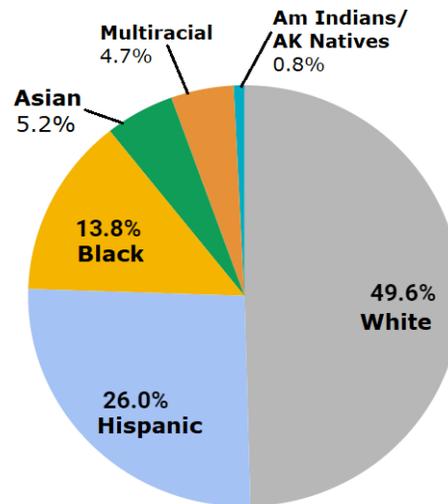


Figure 1: Race-ethnic profile of children born since 2007, U.S., (2018)[10]

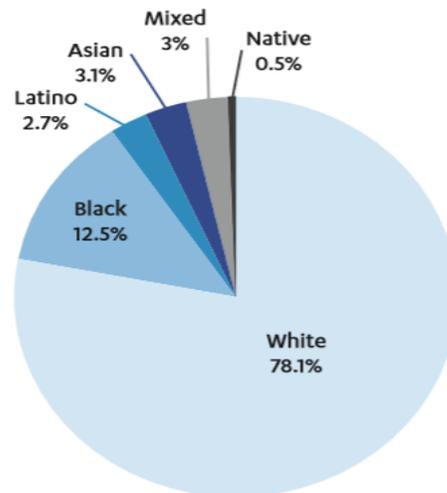


Figure 2: Share of Film Roles, by Race, 2016, Hollywood (n=1,352)[15]

In 2016 the share of White film roles is over 70% leaving only under 25% of the roles to racial minorities. The share of White leads in film was up to 86.1% leaving minorities to a 13.9% representation. [15] Lembcke [19], as well as Boyd and Erigha [2] point out that there is an ongoing belief audiences do not want to watch movies with black actors on screen, and thus, films with black actors would not succeed in the box office as well as films with a more White cast would. On the contrary several movies with a cast full of famous, often White, actors have been huge disappointments. It is also important to point out that actors with big names do not

alone guarantee successful box office revenues. In addition to the cast's performance. The success of a movie is a combination of multiple factors such as screenwriting, music composition, locations, costume, make-up, editing, and marketing just to mention a few.

Studies and real-life examples also have proved these beliefs to be a misconception; A diverse audience wants to see diverse characters on screen who they can easily relate to. This does not only mean the characters' stories and personalities but also their appearances. [14] *Crazy Rich Asians*, a bestselling novel by Kevin Kwan (2013), was adapted to film in 2018 and made history by being the first Hollywood film with a majority cast of Asian descent in a modern setting since *The Joy Luck Club* in 1993. It was important for Kwan to have a respective representation of Asians in the cast, and allegedly turned down an offer to cast a fully white American female actress for the leading lady role, who in the original novel is an Asian-American [29]. The movie received a domestic total gross of over \$170 million against a production budget of \$30 million making it the top grossing romantic comedy in 10 years in U.S. and Canada [35]. Another example of a box office success with a diverse cast is Marvel's *Black Panther*, which premiered in 2018. *Black Panther* is the first Hollywood produced mega budget film to have a predominantly Black cast as well as a Black director, Ryan Coogler [27]. The movie's release was a success and in box office grosses *Black Panther* ranks domestically (U.S.) as fourth (4) and globally tenth (10) [36]. Needless to say, race did not make this movie a flop either financially or reputationally.

It is interesting to see how production companies are repeatedly able to justify their biased decisions, even though direct links to prove that diversity on screen would not have a negative effect on profits exist:

*"Despite false claims to the contrary, there is no trade-off in Hollywood today between diversity and profitability. Diversity is clearly a plus factor for the bottom line. Nor is there a trade-off between diversity and quality. Quality storytelling plus rich, diverse performances equals box office and ratings success. Year after year, the evidence supporting this equation continues to mount."* [14:74]

Not all studies unanimously state these same results and a study by A. J. Weaver in 2011 [31] shows how there can also be issues with having a diverse cast. The study showed that in romantic films White audiences tend to favour films with a full white cast, at least regarding the leading couple, instead of an interracial or fully Black one. This, though, could also be due to the fact that *"White audiences perceive romantic films with minorities as 'not for them' because they seldom see minorities in race-neutral romantic roles."*[31:383] A. J. Weaver also states that *"a better understanding of the role of race in this context could provide a better sense of how producers could successfully target films with minority casts*

*to the majority audience, which could allow us to move beyond the common practice of consciously casting by race in supposedly race-neutral contexts."*[31:383]

*"Popular culture that portrays whiteness, light skin and Eurocentric features as the epitome of beauty and basic humanity"* is the result of continuous discrimination towards people of colour, which has been an ongoing phenomenon for years [19]. The fact that we are accustomed to norms that are powered by the Western ideal of beauty, wealth, and success has subjected people to unconscious light-skin bias. As an example, if people of colour are casted for a film, skin tone can play a big role in the choosing process meaning that the individuals with a lighter shade of black and straighter hair can be favoured over darker skinned individuals with nappier hair. The former represents a version of Blackness that is closer to Whiteness than the latter.

The underrepresentation of POC on screen is a serious concern especially for adolescents of all backgrounds, because they are highly influenced by the images of mainstream media [23]. Approximately from the age of 12 to 25 is a critical time for the physiological and socioemotional development of adolescents. Mainstream media giving a stereotypical representation of different races and ethnicities is transmitting a message to all adolescents around the globe, what type of appearance, regarding for example skin colour, and hair and body type, are desirable and which ones are not. [6]

Skin tone bias, also known as colourism, is often unconscious and a by-product of racism. Society naturally aims to favour the individuals whose appearances are closest to White people [6:473]. Pop-culture has a tremendous impact on sustaining these ideals, which has opened a market for businesses of anti-blackness. Surgery, skin lightening creams, blue and green contact lenses, hair weaves, and chemicals altering curly, natural hair to make it straighter are all telling a message to black males and females alike that the way they naturally look is not acceptable in the modern world. [6,19]

To understand the issue better, researchers have introduced different models that could help people realise what type of effects and consequences the messages people constantly receive from their surroundings, media included, can be. One example is the Tripartite model which is introduced in the research paper by Craddock et al.:

*Colourism: a global adolescent health concern (2018): "The Tripartite Model is one of the most well-established sociocultural theories for the development of body dissatisfaction and subsequent eating disorder. The model proposes that family, friends and the media influence body image and disordered eating via the extent to which individuals internalize cultural beauty ideals and make appearance-related social comparisons."* [6:474]

They go on to suggest that due to the fact that skin colour is an apparent part of cultural beauty ideals, the Tripartite model could help explain how sociocultural pressures for lighter coloured skin can lead adolescents of colour to form a dissatisfactory relationship towards their body and their appearance and lead to damaging skin-lightening behaviour. [6]

According to the feminist author and activist bell hooks “mass media was, and possibly still is, [...] a system of knowledge and power reproducing and maintaining white supremacy” [13]. According to hooks, white people have created mainstream media in their own image, hereby subconsciously granting images of whiteness their perceived essential quality, rather than a racialized quality, employing ‘white representations of blackness’ [13] in addition to overwhelmingly white stars. Hollywood cinema is illustrative of Western white hegemony, as white people ‘construct the world in their own image’ [8:12]. Thus, ‘Hollywood has never been apolitical’ [12:282] or unbiased in terms of racial representation [19].

Misconceptions about diverse casts affecting the success a movie will have in the box office can be proven wrong with numbers and statistics, but the reasoning behind whitewashing is more complex than numbers. Everyone, even people belonging to racial minorities, are guilty of conveying unconscious and implicit bias against each other. This might not happen all the time, and some are more guilty of it than others, but nonetheless it happens. [19:73] We are all biased and always will be. Behavioural change does not happen overnight. On average it takes approximately over two months to fully change a person’s belief or a way of thinking, but it can also take up to over 200 days [17]. According to the Directors Guild of America, they are representing more than 17 500 directors and members of the directorial team [39]. The Casting Society of America states they represent over 1000 members worldwide [40]. The producers guild of America states they have over 7 000 members of the producing establishment around the world [33]. Needless to say, if it takes over 2 months on average for one person to make a change in their way of thinking regardless of the topic, it could take decades for a mass as big as over 25 500 individuals in the U.S. to change, not to mention on a global level.

### **The casting process for film and biases within it**

In brief, the casting process is a part of a film’s pre-production, where actors are scouted, auditioned and selected. Nothing is done until the script is finished. Depending on the script, it can already set a lot of limitations for a cast. The story can be set in a specific part of the world or time in history, which can set limits for what type of individual would be the best fit to act a character. In mainstream drama films, scripts can be either

original screenplays, which means that the script is not based on previously published material such as film adaptations from novels, books and comics. In the case of an original screenplay, the writer has full power in creating the story and can have written the script with specific actors or actresses in mind. This is a common place for bias to creep in, resulting in favouritism towards specific actors or racial groups which can affect the casting process.

Once the script is ready, a casting director will oversee scouting and auditioning the actors and actresses to see if they are fit for the roles, before a set of actors are presented to the director of the film. The casting director creates cast breakdowns according to the script, which are descriptions of the type of characters that are available for audition. If the characters’ appearances are already well defined in the script, including ethnicity, the casting director would have to scout for actors and actresses within those limitations. The casting director does not make the ultimate decision on who will be chosen for the roles of a film, and the production’s executive creative team can override such descriptions of characters and claim to change them due to their own creative vision. The final decisions on the cast is often made by the director, sometimes backed up by the producer. [18] This dynamic, though, might change depending on the size and type of the production, but as a generalization this is a normal process for Hollywood films [20]. In addition to all of the above, the casting director and the director must also see how well the actors work together with each other and oversee chemistry reads between actors before making any end decisions on who to cast for which role.

Casting in its own way is a recruitment process, but with a focus on different elements than in traditional corporate recruiting. In traditional corporate recruitment the appearance, sex, or ethnic background of an applicant are attributes that should not be used to evaluate the competency of an individual. On the contrary in film casting, these are factors among other things that directors specifically monitor. When scouting and choosing actors and actresses for film roles, the focus is specifically on how a person looks and acts, how they portray emotions, speak and sound like, and how they work on camera. The actor’s reputation and fame also play a key role. In this setting, skill sets, and education can often be considered as minor factors in a casting process, whereas in traditional recruiting they can be at the centre of a choosing process. The feeling and the image that the actor/actress transfers to the director, writer, and producer, and ultimately also the audience, is what matters most.

Skill sets and educational background might be easier to evaluate more objectively, whereas the above-mentioned external attributes of auditionees and the feeling they pursue to transfer to the creative team are

more abstract and harder to evaluate on a set scale, which makes the evaluation prone to bias. Common definitions for the word 'bias' are: the action of supporting or opposing a particular person or thing in an unfair way, because of allowing personal opinions to influence your judgment"; and "the fact of preferring a particular subject or thing" [41]. Vasconcelos et al. argue that the former definition indicates unfair judgement and the latter refers to a *preference*, which could be argued that "every decision-making process is about arriving at a reasonable preference (bias, in the second definition)" [30:324].

Vasconcelos et al. explain in their research paper *Modelling Epistemological Principles for Bias Mitigation in AI Systems: An Illustration in Hiring Decisions*, that there are several kinds of biases that could influence a hiring process, which in their study refers to corporate recruitment and not casting. This being said, the examples the authors make can be reflected onto the casting process. Confirmation bias of first impression is a good example. It is where a recruiter or a director makes a first assessment in the beginning of the interview or audition and then spends the rest of the time looking for reasons to support their initial impression. This could be either to the benefit or to the disadvantage of the individual in question, but in either case it would be unequal to all applicants.

An example from the real world can be taken from a whitewashed movie called *Ghost in the Shell* (2017), where the director Rupert Sanders casted Scarlett Johansson to the leading lady role, which was argued should have gone to a female Asian actress in order to be respectful to the origin of the story. The director, Rupert Sanders, stated that he sticks behind his decision to cast Johansson as the best fit to the role because he *felt* that she channelled the character better than anyone else he could have thought of. She was his first choice and remained his first choice. [19:35] Sanders' only argument here appears to be his gut feeling, which should not be considered a justifiable excuse for whitewashing the film. It could be argued that unconscious bias clearly plays a role in Sanders' decision making.

Actors are chosen for roles based on the creative vision of the director, which can vary greatly between directors. [20] A director might naturally be biased to choose actors they have already worked with before. The phenomenon where directors recycle the same actors, as in using the same actors repeatedly, is also something that is widely known of and has been done in Hollywood for decades. Famous examples of actor-director combinations are Tim Burton and Johnny Depp, Quentin Tarantino and Samuel L. Jackson, and Woody Allen and Mia Farrow, who all have made more than three movies with each other.

The reason behind such behaviour can be explained by ingroup-outgroup bias, where the ingroup is

favoured over the outgroup. An ingroup is defined as an exclusive group of people who share the same interests and or identity [42]. In the context of Hollywood film casting, the familiar ingroup creates a feeling of security and safety for both the director and actor(s) since they have already established artistic synergy through previous productions. In film production, time is a valuable yet scarce resource to have, and thus by working with people you already know and with whom one has already created a well-functioning work routine, can save a lot of time and money.

Furthermore, bias can already be planted in the script writing phase. As mentioned before, the writer can create the storyline with specific characters in mind with a specific race. The fact that all mainstream media is overpowered by whiteness, such as white protagonists, white heroes, white commercials, and white fashion, it is not surprising that creators might tend to create White leading characters that naturally just seem to feel good, due to the image we consume from mainstream media on a daily basis.

### **AI in corporate recruiting**

As stated before, casting could be looked as a unique recruitment process. In order to investigate how artificial intelligence could help industry professionals in Hollywood film to fight whitewashing in casting and the biases that uphold it, it could be beneficial to investigate how technology is already being used as a tool in other recruitment processes. Multiple companies are already providing different types of artificially intelligent solutions to be used as a tool in recruiting. The bigger the company the more applicants for each open job position. This can mean that recruiters might have to deal with hundreds of resumes and cover letters before even choosing which applicants to be invited to an actual interview. Often there just is not enough time to have a thorough look on each application in detail by hand and some are just simply left out without evaluation. This has resulted in creating AI tools in the hopes of reducing, or even completely removing time consuming tasks such as screening resumes. Thus, the AI tools are not expected to, nor are they capable of, conducting a whole recruitment process on their own as of yet.

But is merely screening resumes a trustworthy, fair, or beneficial way to evaluate applicants? Caitlin McGregor, the Co-founder and CEO of Plum.io, an I/O psychology inspired AI solution company for talent management, argues that screening applicants through resumes is not the best way to go. McGregor believes that if instead of focusing on skills and knowledge, recruiters would focus more on talents that cannot be found in a traditional resume, companies would make better hiring decisions in the long run. The talents McGregor talks about are for example innovation, adaptability and

communication. These attributes can be measured by reviewing applicants' personality, problem-solving ability, and social intelligence. [1]

Casting always requires an audition. Very rarely can a cast member be evaluated so roughly as applicants are in corporate recruiting through scanning resumes. In casting, resumes do not mean a thing since anyone can easily make up credits on a piece of paper, and it is extremely rare to be casted for a film just by handing in a resume [18]. Thus, AI capable of scanning and evaluating resumes, would be unnecessary for a casting process, but a technology, that could focus on skill sets and soft skills, such as McGregor suggests, could be of use. The tool created for casting should not take care of the whole casting process but help reduce or remove time consuming and difficult tasks, leaving room for professionals to focus on the creative work.

### **Biases in technology**

There appears to be some debate on the capabilities of AI. Some argue that AI is merely capable of doing repetitive monotonous tasks [26:52] and others believe AI can even make objective and more predictive decision with the right data than ever before [1]. The technologies used in hiring are not yet completely flawless and there have been incidents where recruitment AI has been biasedly discriminating specific groups of people for example by gender.

As an example, in 2014 Amazon created computer programs to screen applicants' resumes. In 2015 Amazon realised that the system they had created was discriminating female applicants and favouring males. The recruitment system had been given a dataset of historical data of Amazon's employees to use as a benchmark when evaluating job applicants. What Amazon did not realize was that historically, the majority of their company's employees, especially on the higher levels of hierarchy, were male and thus the recruitment AI also favoured male applicants over female applicants. Allegedly, according to Amazon representatives, this technology was never put into actual use. [7]

Another incident was discovered by Joy Buolamwini, a computer scientist and digital activist based at the MIT Media Lab. While using a face recognition tool, Buolamwini found out that the technology works well with her lighter-skinned friends, but it did not detect her own dark-skinned face at all. Inspired by this discovery, she investigated if this was a pattern that did not just occur with her unique facial features but with others too. Through her MIT thesis [4] made in 2018, Buolamwini found out that the facial recognition technologies developed by big tech companies such as Microsoft, IBM and Google, in fact may not recognize a dark-skinned face at all, or if so, the error rate of evaluating the age and gender of the individual can be alarmingly high. As an

example, the error rate for darker-skinned females could be up to 34,7% whereas for lighter-skinned males the error rate was only 0,8%. The difference is significant and, in every way, unequal and unjust. In result of Buolamwini's study, Microsoft and IBM quickly pursued to address the problem and announced that they are working towards developing fairer technologies to minimize issues like this [24].

Buolamwini states that "*we have entered the world of automation over confident yet under prepared*" due to the lack of diversity in the datasets used for benchmarking [3]. It is soothing to hear that when confronted with these issues, companies take the matter seriously, yet it is worrisome that the technologies are having these problems in the first place. These technologies will go on to be used not only in recruitment systems, but in our health, governmental and juridical systems and potentially in our entertainment businesses such as film casting as well. When we are leaving the fate of an individual in technology's hands, the tech needs to be in excellent condition already on the first day of its official use. The challenges of having AI making decisions on behalf of us humans have been recognized and research communities have started to address these bias challenges [30:323].

Bias cannot simply be plucked out of the system when it has been detected, because the bias can creep in at any stage of the machine learning process in very unpredictable ways and be left unseen [5]. Embarrassing situations, such as Google Photos mislabelling a black woman as a Gorilla instead of a human, are the result of these crept in biases [16,34]. In film casting and scriptwriting, it is slightly easier to narrow down the area where bias most likely will creep in, since the people responsible are easier to find. AI is slightly more complex because the people responsible for the data given to the system can be harder to narrow down to a few people. Since AI systems will always have to rely on human-generated data, they will also always be subjected to bias, sometimes even prejudice [30:328]. However, there also exists other schools of thought that believe bias can be overcome in AI. Accenture's lead for responsible AI, Dr. Rumman Chowdhury, outlines that even though humans will always be biased, we can pursue to design a technology to be a better version of ourselves: "*We can't expect an AI algorithm that has been trained on data that comes from society to be better than society - unless we've explicitly design it to be.*" [22]

### **Regulation of AI**

In order to avoid the misuse of poorly designed AI, should artificial intelligence be regulated to ensure safe boundaries for new designs? Erdélyi and Goldsmith [9] identify that in modern societies ubiquitous artificial intelligence will bring up problems with legal and ethical issues of its use. According to them, global problems

require global solutions and thus regulating AI policies would serve everyone, but it is easier said than done.

The research of AI and AI-human interactions is a relatively young phenomenon. This means that understanding the whole spectrum and extent of the problems that will be faced, are uncharted territory to researchers and professionals alike. The need for regulated AI is immediate, but to achieve it is highly difficult, due to lack of collaboration: “*States are generally cautious about sharing information on fate changing technologies*”[9:6]. Creating regulations that could be used globally would also mean complex administration tasks for the entity responsible for the regulations [9]. Depending on the level of authority and independence given to AI correlates with the level of surveillance and regulation needed for the development and use of the AI. For example, AI implemented in legal or medical procedures have a higher level of authority and should be regulated carefully [21], whereas chatbots have a lower level of authority and regulations are not needed on the same level. AI for film would most likely be situated somewhere in the middle of these two extremes.

A study about the attitudes and trends Americans’ have about artificial intelligence was released in January 2019 by Baobao Zhang and Allan Dafoe from the University of Oxford. Their study shows that while the majority of Americans seem to support the development of AI in general, they feel that it should be managed carefully. When asked which entity should be responsible for regulating AI, the results were not as conclusive. Seems that Americans do not have a specific entity they would be ready to trust with something as big as this. When it comes to *developing technology*, Americans would prefer the US military and university researchers to do the job, whereas *regulation of the technology* should be left to tech companies and non-profit organisations rather than government actors. [32:20]

Erdélyi and Goldsmith conclude in their study that in order to achieve global regulations of AI, extreme flexibility with time, and soft legalizations are essential to establish commonly shared ideas, interests, cooperation mechanisms, and solutions in order to create a basis for the future [9]. Trial and error will be inevitable, which is why the testing of the technology should be done in a safe space before making the regulations and the actual technology live and global.

### **AI in film and tv productions**

Artificial intelligence has been taking massive strides in the last decade and innovations within human-centred AI have created AI solutions that could be used as building blocks to decrease whitewashing in Hollywood casts. Here are three examples of AI tools already used in film and tv.

### **Scriptbook**

Scriptbook is a high-tech company which offers script analysis and financial forecasts for filmed entertainment with the help of artificial intelligence. Scriptbook uses data mining, machine learning, deep learning and natural language processing to evaluate the script and give data-driven predictions on the commercial and critical success of film and television. Through the insights Scriptbook gives, the script can be improved before the actual production starts. The algorithm can determine how diverse a cast of characters are in a script and it can test if a script will pass the Bechdel Test. [25] In short, the Bechdel test measures the representation of women in fiction. To pass the test, the story needs to have two female characters who have a conversation with each other about something other than a man. It is worth noting though, that scripts do not always specify the race of its characters, which makes it a hard time for a technology such as Scriptbook to detect possible whitewashing incidents. Whitewashing can also occur later in the casting process so clearing it out on the script phase is not sufficient enough.

### **Affectiva**

Affectiva, is a human perception AI, which by using computer vision, speech analytics and deep learning pursuits to understand human emotions in context. In their website Affectiva states their software detects all things human: nuanced emotions, complex cognitive states, behaviours, activities, interactions and even objects people use.

As an example, American television broadcasting company CBS tested Affectiva’s technology called *Affdex for Market Research* and used it to analyse different video materials such as the facial expressions viewers have when looking at ads and primetime show content. It could also measure the strong emotional connection an audience had to a new character with engagement peaks. These results give insights to content creators who in turn can enhance their product to be the best version possible, when it comes to audience engagement. [37]

### **Geena Davis Inclusion Quotient, GD-IQ**

Geena Davis Institute for Gender and Race Equality are working hard to create change in the film and media industry regarding a fairer representation of all people. They have created a GD-IQ, the Geena Davis Inclusion Quotient, which is an automated analysis of gender representation in popular films. The institute suggests that this tool would be used throughout the whole production process in order to ensure the equal representation of female and male characters in diverse roles. This technology though, is also still struggling with its capabilities of detecting and calculating the screen and

speaking time of race on screen, with good enough precision. [43]

## LIMITATIONS

As an exploratory research paper this study has certain limitations. The backbone of this study is the literature review consisting of sources both from academic releases and online interviews and articles. As stated earlier in Regulation of AI, the research of AI and AI-human interactions are a relatively young phenomenon, which means there is a shortage of available academic data, which explains the need to also rely on interviews and online articles. No qualitative or quantitative research has been conducted to support the exploration objective of the research, which means that the conclusion of this research is not supported by any conclusive research.

This study talks a lot about bias, and one should remember that the author has their own biases which have affected which sources and literature have been chosen to support the hypotheses stated in the introduction and those same biases have influenced the topics and ideas introduced in the Discussion section. In addition to this, every individual reader of this paper also has their own biases, which in turn will affect how they will interpret this exploratory research and its conclusions. Thus, critical thinking is advised.

## DISCUSSION

Whitewashing has been an underlying menace of the Hollywood film industry for decades by discriminating people of colour on and off screen, including the audiences by not having a fair representation of people of colour and ethnicity for them to see. There are multiple different ways to fight against whitewashing, colourism and racism in film, but this paper focuses specifically on the possibilities and capabilities of artificial intelligence helping resolve the issue of whitewashing.

None of the examples of AI that are implemented into either traditional recruiting or into film and tv production are being used more than as a tool. *Scriptbook*, *Affectiva*, and *GD-IQ* are all proof that there is a market for AI solutions within a creative industry such as film and TV. All of those technologies are only providing additional help to the experts in the field; *Scriptbook* offering insights on the scripts and storylines, *Affectiva* providing understanding on human emotions, behaviours and interactions, and the *Geena Davis Inclusion Quotient* showing data on the representation of different genders. All of these are targeting a specific need and not trying to conduct a whole stage of production on their own. This is what artificial intelligence could also do for whitewashing by functioning as a neutral assistant bringing insights and

data on the representation of race and ethnicity as a whole in correlation with the storyline.

The technologies used in traditional recruiting presented in this paper have brought insight on how AI has been used to evaluate individuals applying for specific positions and what the challenges have been in those situations. The technology used in casting would have to address different attributes in applicants than in traditional corporate recruiting. These attributes are for example, the appearance of auditionees, their way and tone of speaking, their way of moving, and their way of portraying emotions. Thus, the same technology would not be used in both corporate recruitment and casting processes interchangeably, since traditional recruitments main focus is not in the way people look and act, but on their knowledge and skill sets for the job in question.

It must also not be forgotten that the cast is heavily tied to the script of the story. The script can already give multiple restrictions that define and limit the cast. The script can state very clearly how the person looks like: what colour hair, what body type, what skin colour or ethnicity should the character have and how they should speak. More subtle ways of setting limitations for characters could be for example by the names of the characters. As an example, for a character with a very Finnish name such as Janne, would most likely not be casted an actor from India, unless of course there would be a specific reason for it, but as a general rule of thumb, names with specific origins can already set limitations on the ethnicity or race of the actor. Thus, in order to decrease whitewashing in casts, one must think about developing the scriptwriting process in addition to focusing on the actual casting.

The artificial intelligence developed for fighting against whitewashing could be a combination of the technologies described above: *Scriptbook*, *Affectiva* and *GD-IQ*. Each tool would have to be developed to fight whitewashing and racial bias, since none of them are focusing on race. *Scriptbook* could take care of the scriptwriting process by challenging the writer to include minorities already in the writing phase. *Affectiva* and *GD-IQ* could in turn help in the auditioning phase which are often recorded for later use. The AI could screen the video material and check for the diversity of the people auditioning as well as the conversations the casting director and/or director have with the auditionees and check for any unfairness or inequalities. The AI could give suggestions of different actor and actress combinations for different roles and point out any inconsistencies regarding race representation. Later in post-production if needed, the *GD-IQ* could be used to monitor the editing phase and check that scenes with Whites are not favoured over scenes with characters represented by minorities. This way could be check that both Whites and POC get as equal amount of screen time as possible all the while

keeping in mind what is best for the story. A film with a duration of over two hours means that there is a lot more video and sound material than those two hours. The technology could assist the editor by quickly going through the edited material and giving data on the screen and audio time of each character making it easier to see where the film might still be lacking regarding diversity. Of course, none of these technologies should be used slavishly and there needs to be room left for creative vision, but as mentioned before, these technologies would be used as tools to help industry professionals, not override anyone's decision making.

None of these technologies are fully equipped to take on the challenge of whitewashing and bias on their own, because there is a high risk, that they themselves contain bias, even though none of them have been reported of having bias as of yet. But since all AI is built by humans, and all humans have bias, shouldn't these technologies also have it? *GD-IQ* and *Scriptbook*, among other things, have been built with a purpose of fighting against gender bias. Could it be, because they are specifically used to fight against gender bias, they have not faced any criticism of conveying biases of their own? It would certainly be interesting to find out. And if biases were to be found, would it be targeting something completely different than what AI has been reported of been biased of before?

As stated in the Regulation of AI, one cannot simply create a checklist of fair, ethical and equal qualities that they would want AI to abide by. To create an AI to diminish whitewashing in casting, the development team should consider consulting a variety of experts from different fields. Professionals from the field of film and TV, meaning both White people and people of colour, should have a part in creating the principals for the technology, because they are the ones who will use it. Especially White film professional need to understand how whitewashing happens and how their actions are perpetuating it. By working together with people of colour from the same industry, could help them realise their own biases, although POC alone should not be burdened with the responsibility and emotional labour of lecturing Whites of their racism.

As mentioned before, the concept of fairness can differ a lot depending on who you ask. Thus, experts from ethics should be consulted in order to have a deep understanding on the concept of fairness, that the technology is pursuing to engage with. A diverse set of professionals in society and culture studies with different cultural backgrounds could provide a better understanding on cultural appropriation and racism and how to handle them in practice from an academic point of view. Experts from psychology could provide insights on the cognitive biases and how the power dynamics and history of film

might affect the decision-making process of scriptwriters and directors among other film industry professionals.

The task of creating regulations for AI on a global level might be slightly too ambitious. Different countries, cultures and groups of people have a different set of opinions on which things are considered fair and ethical and which are not. One must not forget that for example fairness and equality are not the same thing and what might be considered equal at a global level, can be extremely unfair towards specific groups of people on a local level. Thus, one cannot simply create a checklist of the ethical factors that AI needs to act by, because ethics and fairness differs depending on who you ask. For diverse and equal casting, what would be the best set of fair factors and who should be the one to set them? Even though Hollywood is based in the U.S. the stories that films tell and the worlds they are built in for film are from all over the world or even completely out of it. Would the regulations thus need to be made on a local level in the U.S. or would the technology need global regulations?

As mentioned earlier, Zhang and Dafoe's research discovered that in the U.S. the majority would prefer the development of technology to be left for the U.S. military and university researchers whereas the regulations of technology should be left for technology companies and non-profit organizations, not government actors. Zhang and Dafoe talk about AI more on a general level, regarding for example workplace automation and military AI, which are not necessarily relevant for the scope of this study. A takeaway that can be of use though, is the finding that the majority of Americans would not prefer any government actors to be a part of the development or regulation of artificial intelligence. This would most likely also apply to the AI used in film and TV.

One could argue that it does not matter what the public has to say about the development and regulation of AI used for the casting of films and the final say in the matter should be left for the film professionals who actually would use the technology for their own work of art. But since this technology would be used to fight against racial oppression, it could also be argued that the public specifically should have a say in the way the technology is regulated. A lot of Hollywood films are also funded by investors and banks, which might be more willing to cooperate with a production that they would know of using a technology to fight against whitewashing.

The technology itself would not have to be completely transparent. While full transparency can build trust, it also invites untrustworthy players who can damage the system by having access to it. The developers would need to find a way to make the technology as transparent as necessary to reassure the safety and privacy of the AI, but at the same time make it

accountable so both the public, investors and professionals can trust it.

The examples of whitewashed films this paper has brought to light are all by White male directors. When googling “best directors of all time in Hollywood” you get a long list of White male directors [44]. When googling “best screenwriters of all time in Hollywood”, the same thing happens [45]. The paper mentions two successful films with a diverse cast, *Black Panther* and *Crazy Rich Asians*, which both are by non-White directors (*Black Panther*’s director being Ryan Coogler, who is Black and *Crazy Rich Asians* director Jon M. Chu being of Asian descent). Is this a mere coincidence or can we assume that White male directors are more prone to whitewashing their films than directors of colour? One could ask; would whitewashing even be this big of an issue, if the film industry would have a more diverse set of professionals behind the camera to begin with? Would artificial intelligence even be needed to solve this issue? As mentioned in the introduction, the change towards a more diverse industry has thus far been extremely slow, regardless of efforts to make change. Thus, if anything the technology, if developed, used, and monitored correctly, would not slow the process down but provide assistance.

## FUTURE RESEARCH

As an exploratory paper, this study’s objective is not to present any conclusive results, but to explore if technology would have the capability of helping resolve the issue of whitewashing in Hollywood films. As this subject has not been under much observation before, this paper merely scratches the surface of this area, introducing a new way of looking at how whitewashing could be solved. Thus, many topics are left untouched in this paper and are left for future research.

It would be of interest to study how whitewashing is addressed in film schools and are students given tools to fight against it. The power dynamic of the director holding so much authority in the decision-making process over everyone else is intriguing and would be insightful to research how other professionals feel about it and is the amount of power directors have justifiable or not.

This paper focused on minorities of race but as mentioned in the Introduction, there are many other minorities that face discrimination in the film industry both behind and in front of the camera. The industry needs to become more diverse on both sides, but should it or could it be done by the help of artificial intelligence and if so, how?

## CONCLUSION

Could artificial intelligence help resolve the issue of whitewashing in Hollywood film? Yes, AI should have the capabilities of being developed into a tool that can provide insights on equality and fairness when it comes to the diversity of casts in respect to the storyline of the script. AI should only be used as a tool and not be given too much authority, leaving the decision making to the professionals. It should be thought of as a neutral assistant giving data driven insights on the level of equality and fairness of the data it has been given. The data can be extracted for example from the script, audition tapes or even from the final edit of the film. Unconscious bias, and when and where it specifically creeps in, is hard to pinpoint. Thus, getting data quickly from a neutral party, could make the change towards a more colour-blind Hollywood film industry faster, smoother and more comfortable than having people do it on their own.

There does not appear to be artificial intelligence that is developed to this specific use yet and none of the examples of AI used in either traditional recruiting or in film and TV productions are capable of recognizing and evaluating individuals by race with good enough precision as of yet. To mitigate whitewashing in the film industry, the whole industry needs to become more diverse behind and in front of the camera and technology could help make the transition process slightly less painful for everyone.

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