



Applying Machine Learning Techniques To Analyse The Themes Of Feminism And Nature In Hayao Miyazaki's Films 'Spirited Away' And 'My Neighbour Totoro'.

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ABSTRACT

Since 1963, Hayao Miyazaki has been a feminist. He has portrayed the journey of strong, self-reliant, nature's child female characters who are able to fight without the use of weapons by using empathy, communication, and relationships with their peers. In the films, feminism opposing patriarchy and society is closely linked with the exquisite depiction of nature. This study analyses the environmentalism and heroines in Miyazaki's films. It talks about gender and environmental issues that are present in films that represent society. With this study, we hope to raise awareness of two important facts: first, women can be heroes just as much as men are; second, nature is the ultimate power that cannot be subjugated by society. It debates Miyazaki's feminist approach to his films, which trace the protagonists' journey from meekness to strength and independence as strong, self-reliant figures who will inspire girls for generations to come. It also enjoys the tranquil and realistic landscapes that Ghibli films capture. Beautiful locations that are more than just scenic scenes have a deeper significance: they serve as a testament to the force of nature, the relationship between it and humans, and the duty of being mother nature to the fictional characters. Overall, Miyazaki-San's films have garnered a favourable impression, as seen by the absence of any unfavourable comments in the survey replies from audiences. This result was achieved with a machine learning model that achieved an accuracy rate of 92%

Keywords: Hayao Miyazaki, Feminism, Nature, Spirited Away, Anime, Studio Ghibli

Introduction:

People from all walks of life and cultural backgrounds must find inspiration in your creations, which are the fruits of your imagination and brain. Movies give you the opportunity to portray enduring themes from your life. This is art, and Hayao Miyazaki is the creator of this art.

Hayao Miyazaki is a highly recognized and esteemed director of Japanese animated films. He was born in Tokyo on January 5, 1941. His depictions of nature, adorable and relatable powerful women, and—above all—

everything that speaks to contemporary issues in Japanese society have made him renowned. In Japan and beyond, he is well-respected for the artwork he creates. Better to state that he is respected everywhere. It wouldn't be an exaggeration to say that he is a perfectionist in the global animation industry, even though many of his anime viewers are young. His works are intended for those who truly understand art and animation. Even though most of his anime viewers are young, it wouldn't be an exaggeration to say that he is a perfectionist in the worldwide animation industry. His creations are meant for people who understand animation and art in its truest sense. Because of his work on *Spirited Away* and *Grave of Fireflies*, among other movies, he rose to prominence as one of Japan's most talented and skilled animators. Fig 1 shows the Hayao Miyazaki with his famous characters.



Fig 1. Hayao Miyazaki with his famous characters

Hayao Miyazaki: a legend

Despite being highly accomplished as a director, Miyazaki San maintains a simple and altruistic lifestyle. His supporters are pleased that, despite his efforts to distance himself from the film industry, he persists in creating exceptional works of art. This suggests that they still have faith in his ability to employ his creativity and enthusiasm to challenge the limits of storytelling and construct extraordinary realms. His works will serve as a source of inspiration for future generations, and surpassing his legacy will be challenging for anyone. Miyazaki san, together with his crew, is well-known for creating formidable female characters. The disparity between his female characters and those of other manga creators is readily apparent when comparing them. Haruno Sakura, the female character from Masashi Kishimoto's *Naruto* and *Naruto Shippuden*, has been derogatorily referred to as "garbage" due to her reliance on her male counterparts, which sets her apart from the independent Miyazaki heroines. Sakura is a polarising character as many individuals contend that she has made no significant contributions to the narrative and is simply perceived as a liability to men. While it is undeniable that the character is portrayed as useless, the question arises whether our anger should be directed at the character herself or towards the manga artist for depicting her in such a manner. Contrary to popular opinion, a minority of individuals persist in backing Sakura and asserting her significant contribution to the male characters.

It is fascinating to note that two manga authors might engage in a passionate disagreement regarding their characters. Ghibli heroines are portrayed as admirable and worthy of admiration, while characters like Sakura, who do not deserve to be despised, are depicted differently. The most fascinating aspect of it all is the discourse surrounding it. From a broader perspective, there has been a longstanding emphasis on male characters in discussions. However, Japanese animation has sparked a desire among viewers for powerful female characters that are not merely present as romantic interests for the male protagonist or as a means to showcase their strength by confronting antagonists. Conversely, Miyazaki San and his colleagues actively seek out the feminine attributes inherent in all women. To the ladies who observe them, they embody all the essential qualities to serve as a source of inspiration.

Anime

Anime, derived from the Japanese word "animation," refers to a genre of visual storytelling that involves the creation of hand-drawn and computer-generated images. The animation is primarily derived from Japanese comics called manga. The collection encompasses several genres and subjects, ranging from shōnen and shōjo to fantasy and slice of life. The popularity of this has consistently increased since its beginning. The Japanese government perceives it as a potent instrument for spreading Japanese culture on a worldwide scale. (C, Lei, 2021).

Upon my initial viewing of *Spirited Away*, I was utterly amazed by the breath taking visuals and artistic representation. Miyazaki's superb narrative techniques enrich the dramatic and fascinating plot. Witnessing Sen/Chihiro's evolution from a little child to a resilient and self-reliant girl who embarks on a journey to a strange and foreign place, where she not only safeguards herself but also others around her. Each character is charming and likeable. Miyazaki-San's drawings exhibit a certain human quality, giving the impression that

they are real individuals. Upon departing the bathhouse in the film, Sen/Chihiro proceeds to don her footwear and then tests their fit by gently tapping her feet on the ground. The inclusion of these subtle details in a movie enhances its relatability. In this research, I will analyse the films "My Neighbour Totoro" and "Spirited Away" using machine learning. These films have garnered immense popularity among viewers and offer us all the necessary elements while quietly tackling significant societal concerns. What sets Miyazaki apart from other authors is his unique approach of presenting concepts.

Literature Review

The researcher has extensively analysed a wide range of scholarly papers, books, articles, and films authored by other academics to gain a more profound comprehension of Miyazaki's life and artistic creations.

Li, C. (2021): Discusses the impact of Miyazaki on the proliferation of cross-cultural elements in Japanese anime following the advent of 5G technology. During the early 21st century, the Japanese government significantly increased its funding for the animation industry, which happened to coincide with Miyazaki producing his most exceptional works. By around 2013, the animation business had a remarkable surge in both financial success and widespread appeal. Consequently, this has played a significant role in spreading Japanese culture worldwide. The Miyazaki movies prominently showcase the culture and civilisation. The impact of both Chinese and Western culture is evident in anime, contributing to its worldwide popularity as viewers can personally identify with it. The introduction of 5G has significantly influenced the manner in which individuals consume material. Television sets have been supplanted by mobile phones. Viewers have a preference for concise movies over lengthy ones, since they do not want to endure interruptions or delays in between. The advent of 5G technology has significantly enhanced cross-cultural communication, while also intensifying competitiveness within the sector.

Greenberg, R. (2022): In his book, Raz Greenberg delves into the early works of Mr. Miyazaki, specifically his show "Heart," also known as "3,000 Leagues in Search of Mother" in Japan. Greenberg recounts his experience of watching the show from childhood to adulthood, unaware that it was originally a Japanese show dubbed in another language. Upon seeing the author's works, the individual was deeply moved and subsequently chose to write their Master's thesis on the author. His book delves into his early career in cinema and television, exploring the works that served as inspiration for the topics and style that shaped his later impactful works. He provides a comprehensive and detailed overview of Miyazaki's journey, including his beginnings, artistic accomplishments, body of work, personal life, obstacles faced, and status.

Noviana, F. (2022): In her research, Fajria Noviana emphasises the repetitive motifs seen in Miyazaki movies, namely nature and women. In her eloquent analysis, she elucidates Miyazaki's intention in his anime film "Ponyo on the Cliff by the Sea" to express the idea that, akin to nature's independence from civilisation, women are not subject to men but rather meant to cohabit harmoniously in the world. The anime clearly depicts a connection between nature and women, highlighting their empowerment and ability to efficiently handle both domestic and professional responsibilities, much like how nature serves as the central force of existence on Earth. Women and nature both serve as the progenitors, facilitating the process of reproduction in both the natural world and human society. In her research, she closes by making comparisons between the female characters depicted on land and at sea in the anime, highlighting their pivotal role in driving the narrative of the movie.

Prats, T. (2016): In her work, Trafi Prats provides an analysis of feminist girl subjectivity in Miyazaki movies. She focuses on female characters who defy limitations and embrace the creative potentials of their environment. Her speciality lies on movies featuring shojo, which are teenage female characters, navigating through a demanding and difficult world. Miyazaki's films feature resilient, self-reliant female protagonists that possess a curious and adventurous spirit, even in the face of a hostile and malevolent environment. In the movie *Spirited Away*, the character Sen/Chihiro goes through a series of unforeseen circumstances. She witnesses her parents transforming into pigs and loses her own identity. However, through her diligent efforts at the bathhouse and her ability to form connections with others, she undergoes a process of self-realization. This transformation occurs both mentally and socially, resulting in her becoming a responsible and courageous young girl. She assists not only the male protagonist but also her parents in achieving freedom. Sen/Chihiro is a character inspired by Miyazaki's friend's daughter, who had a deep fascination with the world on a vacation. This observation by Miyazaki led to the creation of a beloved and admired female character that has gained worldwide popularity. She asserts that characters like as Princess Mononoke and Nausicaa are inherently part of the Nature's child narrative. They challenge societal norms by presenting the idea that women are not necessarily subordinate to men, which is a common perception of Japanese women who are often seen as submissive and reliant on males.

Ray, A. (2022): In his essay, Avik Ray reminisces about his initial encounter with the Miyazaki film "My Neighbour Totoro" and the profound revelation that it deviated from the conventional narrative of good vs evil. Instead, the film delved into the dynamics of a family, the tranquil ambience of a cat-bus, a rainy night, the beautiful silence of the countryside, a mystical forest, and enigmatic creatures that had never been witnessed before, all centred around the iconic character Totoro. He elaborates on the prominent issue of environmentalism that is clearly present in all of Miyazaki's films. In the movie, Miyazaki's personal connection, rooted in his nostalgic past with the traditions of Japan and mythical creatures, is shown, much

as in his other works. Nature serves as a therapeutic agent for both girls whose mother is currently hospitalised, providing them with stress relief and nurturing. The film presents a straightforward portrayal of a rural family, including endearing people, and communicates the idea of deriving happiness from modest pleasures.

Mayumi, K.Solomon, B. Chang, J. (2005): They have conducted research that sheds insight on Miyazaki's affinity for ecology, going so far as to label him an ecological economist. Miyazaki's storytelling and filmmaking are greatly affected by Japan's historical, cultural, and political characteristics. From a young age, he developed a keen interest in movies and began dedicating himself to his artistic pursuits throughout his time in senior high school. He displays a strong fondness and love towards his children, and they serve as his primary motivation for producing these movies. Furthermore, the subjects explored in his works are intricately intertwined with ecological issues and other significant events in Japan. His films have effectively enlightened audiences about contemporary environmental issues in a highly sophisticated manner. Artists that aim to spread ecological literacy to their audiences should delve further into his works for further study.

Callis, C. (2020): In her research, Cari Callis asserts that Miyazaki and his collaborators have crafted Ghibli heroines ranging from 5 to 25 years old, who embark on a spiritual and psychological quest akin to the one described in Maureen Murdock's book on the journey of a heroine. She has clearly delineated the stages of the voyage, drawing inspiration from *Spirited Away*, a highly acclaimed film often regarded as the pinnacle of animated cinema. Cari has analysed the sequence of events in the movie that depict Sen/Chihiro's resistance to change in her life, leading to her eventual acceptance of femininity. The quest unfolds devoid of any weaponry, relying instead on the virtues of empathy, self-realization, and embracing one's spirituality.

Research Methodology:

The study utilizes a research methodology that incorporates both quantitative and qualitative methodologies, including character analysis, realism, and movie analysis. Machine learning is employed as a tool for analysis. The research corpus comprises data that spans the audience's perspective, educational elements, analysis of characters, examination of societal issues, portrayal of events, dialogues, persistent themes, and visual representations in the anime. The films "My Neighbour Totoro" and "Spirited Away," directed by Miyazaki, were respectively released in 1998 and 2001. These films will be the main subject of discussion in the paper. The data was collected through the utilization of Google Forms and email communication, then disseminated over various platforms including WhatsApp, Instagram, Reddit, and Gmail. This enabled the acquisition of responses from a wide array of individuals, both within and outside of India. The process of data gathering involves making inquiries. Are you acquainted with anime flicks and Studio Ghibli? Have you watched any Ghibli movies? If yes, which ones? Are you acquainted with Hayao Miyazaki? What specific elements do you admire in Miyazaki's films? What is your preferred Hayao Miyazaki film? Could you please identify your preferred character from Miyazaki's films? Has Miyazaki's work had a profound influence on your own life? Please respond with a "yes" or "no". If the response is positive. Kindly provide your statement. The inquiry pattern is tailored to encompass both persons who have viewed anime films but are unacquainted with Miyazaki, as well as those who have watched and possess expertise regarding Miyazaki. The questions also seek to collect data regarding participants' experiences and viewpoints on his films, encompassing their themes and characters. In addition, specific data was analyzed in relation to the previously stated movies. The text examines multiple themes, such as societal norms, symbolism, the depiction of nature as a formidable entity, the existence of resilient and self-reliant female protagonists, and their affinity with the natural world. Miyazaki's approaches have clarified the representation of women in society.

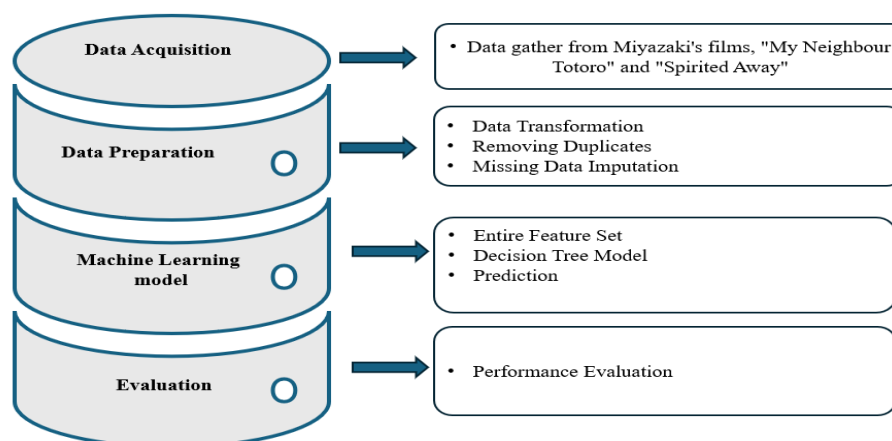


Fig. 2 Workflow of methodology

Figure 2 shows machine learning workflow related to analyzing data from **Hayao Miyazaki's films**. Let's break down the steps depicted in the figure 2:

1. Data Acquisition:

- The process begins by collecting data related to Hayao Miyazaki's films. This could include information about characters, plotlines, animation techniques, and more.

2. Data Preprocessing:

- Before feeding the data into a machine learning model, it needs to be cleaned and transformed.
- Data preprocessing involves tasks like handling missing values, removing duplicates, and normalizing features.

3. Feature Extraction:

- Extracting relevant features from the data is crucial for building an effective model.
- Features could include film duration, character interactions, animation style, etc.

4. Model Selection and Training:

- Choosing an appropriate machine learning model (such as decision trees, neural networks, or SVM) is essential.
- The model is trained using the pre-processed data to learn patterns and relationships.

5. Evaluation and Fine-Tuning:

- The trained model is evaluated using accuracy.
- Fine-tuning involves adjusting hyperparameters to improve model performance.

6. Prediction and Insights:

- Once the model is ready, it can predict various aspects related to Miyazaki's films.
- Insights gained from the model can inform decisions about animation techniques, character development, or audience preferences.

Result

The films directed by Hayao Miyazaki elicited diverse responses from individuals, primarily positive. Nevertheless, a minority of participants indicated that they did not observe any noticeable influence on their life subsequent to watching his movies. Viewers frequently derive a feeling of solace and experience personal development, emotional progression, and affection when watching movies. Characters like Chihiro have had a profound influence on their lives, serving as a reminder that life can be uncertain, but it is ultimately our duty to assertively support our own interests. A respondent has characterized *Spirited Away* as a film that is fundamentally without any flaws. Viewers value the atmosphere, coziness, uniqueness, joy, and allure that they offer. As per the response, these movies offer a calm and peaceful experience. They cultivate an optimistic perspective on life within you. Another person characterized it as "exaggerated art". Miyazaki films surpass the limitations of simple amusement, acting as a catalyst for folks to form significant connections with those who have comparable experiences, feelings, and viewpoints. They inspire aspiring filmmakers to create art that exceeds human expectations in a direct manner. They modify the perspective from which individuals observe women and their reaction to nature. This inquiry has uncovered two noteworthy findings. a) Women has the capacity to take on the role of the protagonist in a film. b) There is a deep connection between the natural world and human beings.

Conclusion

Miyazaki's films consistently explore the themes of feminism and nature. The information he produces reflects his personal experiences, particularly the influence of his mother and his strong commitment to environmental stewardship. The author's characters, particularly the female ones, not only inspire us to cultivate self-reliance but also encourage us to engage with the environment, fostering the belief that even in the face of adversity, eventual resolution is assured. The character Sen/Chihiro from *Spirited Away* is considered to be an inspiring figure in Miyazaki's films due to the audience's appreciation for her transformation throughout the movie. She evolves from being an immature and self-centred child to becoming a compassionate, courageous, and assertive young girl who recognises her significance in the world and develops a deep understanding for her friends and family. The survival of humanity depends solely on the coexistence of nature and humans, as exemplified by the teachings of *My Neighbour Totoro*. Therefore, it is imperative that we express greater gratitude towards the natural world. Women are not inferior to men, as both genders rely on each other for the continuation of the human species and to fulfil each other's requirements. Nature is not subject to culture and has always supported a diverse range of cultures globally. In contemporary times, women have reduced their dependence on men compared to previous eras. They are now liberated to autonomously pursue their objectives. Miyazaki has expressed that he draws inspiration from his daily experiences, a common practice for many of us. We often get inspiration from those around us, learn from nature, and in turn, inspire others. Similarly, Miyazaki possesses a vision that surpasses the capabilities of ordinary individuals, yet he remains part of our collective. I believe it is a mutually beneficial relationship characterised by the exchange of inspiration and being inspired. He draws inspiration from the humans and environment in his surroundings, and in turn, the humans around him are inspired by him.

An article on the depiction of women in Japan highlighted that the perception of women in Japanese society is widely known and this is also evident in their film industry. If I were to enquire about someone's preferred anime character, the response would undoubtedly include Itachi, Naruto, Luffy, and others. However, if I were to specifically request a female character, it would take an extensive amount of time for them to provide a definitive answer, as female characters do not have a significant influence on their thoughts. They play a supporting role in the show, often portrayed as a character who is either a burden or simply a love interest. The industry lacks adequate exploration of the feminine side, and as an individual from India, I personally experience this deficiency. What is the actual number of movies that primarily focus on female characters? Is it 1 in 100, 500, or 100? The ratio has the potential to exceed this value. We are currently witnessing a new era of feminism in which movies featuring female protagonists have become more prevalent over the past decade, albeit they are still relatively few in number. It is incumbent upon a filmmaker to portray societal challenges as part of their ethical responsibility, and we should not anticipate immediate transformations. The transformation may need a period of ten years or perhaps several decades, but the impact will eventually become evident. However, in order to accomplish this, we must alter our perspective regarding the portrayal of female characters in films. We cannot completely dismiss the endeavours of filmmakers who produce movies that focus on women because as viewers, we typically abstain from investing our money in such films. Recently, numerous women have captivated viewers in movie theatres with their performances, and I anticipate their continued success. It is our moral obligation as humans to preserve nature and treat it with the appropriate reverence. This is because we are offspring of the natural world and our actions have had a significant impact on it. Miyazaki's films attract a substantial child audience and impart knowledge about nature to children from an early age.

Overall, Miyazaki-San's movies have had a positive impact, as seen by the lack of any negative comments in the survey replies from viewers, with a machine learning model achieving an accuracy rate of 92%.

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