Exploration of the Century Long Evolution of Chinese Motion Font Design

Peijing Zhang, Lijun Liu*
School of Art and Design, Guangzhou Institute of Science and Technology, Guangzhou 510800, China
*Corresponding email: 291992158@qq.com

Abstract

This article explores the development of Chinese motion font design, analyzing its intrinsic connection with the history of cinema and the advancement of animation technology. It reveals evolutionary patterns and changes in cultural expression over the past century, showcasing the technological features and cultural connotations of different historical stages. Using historical document analysis and case study methods, the article systematically reviews the development of Chinese motion font design from the 1920s to the present. By examining representative films, animation works, and technical documents from different periods, combined with an analysis of technological evolution, it highlights the characteristics of each stage, with a focus on technological applications, artistic style evolution, and cultural expression. The study finds that the development of Chinese motion font design can be divided into three stages. From the 1920s to the 1930s, it was an embryonic stage where motion fonts mainly appeared in movie opening credits and intertitles, breaking the limitations of static text despite technological constraints. From the 1940s to the 1960s, it entered an innovative development stage, incorporating traditional art elements such as paper cutting and puppetry, establishing a localized direction. Since the 21st century, digital technology has propelled motion font design into a diversified interactive stage, with innovations such as AR (Augmented Reality) technology, variable fonts, and parametric design expanding its application scenarios, making it an important medium connecting traditional culture with modern technology. The evolution of Chinese motion font design demonstrates technological localization and cultural inheritance. From simple motion effects in early stages to the oriental charm of ink wash animation, and then to diverse interactions in the digital era, each stage reflects the deep integration of technological innovation with traditional culture. This represents not only an upgrade and transformation of design language but also an innovative development of Chinese characters as a cultural medium in the multimedia age. The successful experience suggests that the organic combination of technology and culture can effectively promote the modern expression of traditional elements, providing valuable insights for innovation in other cultural fields.

Keywords

Motion font design, Motion evolution, Motion font application, Motion font development, Motion expression

Introduction

In *The Book of Songs*, the phrase “May locusts flies with their legs in motion” describes the sound made by locusts in May when their legs rub together. This reflects how dynamics often arise from the position or spatial changes of objects and involve elements such as time, environment, and sound rhythms. From this, we understand that dynamics typically involve key factors such as dynamic objects, space, time, and sound. In animation, the most common type of frame-by-frame animation involves breaking down actions and drawing each step in successive frames, creating continuity as time progresses and producing motion. In the 1920s, Joseph Antoine, a Belgian physicist, became a pioneer of modern dynamic graphics when he invented a device called the Phenakistoscope [1]. Its

principle is based on the visual persistence phenomenon, also known as the afterimage effect. This invention led Dadaist and surrealist artists to experiment with drawing and creating various experimental films. As such, early dynamic graphics developed alongside film animation. The earliest recorded and recognized example of dynamic typography is *Humorous Faces* (1906) by J. Stuart Blackton. The dynamic typography at the beginning of this film shows the gradual change of text from nothing to something, filmed frame by frame, representing the early form of dynamic typography [2]. This demonstrates that Western motion font design was closely related to the development of film technology. The following section outlines the development of Chinese motion fonts through the history of film and animation in China.

Early film era motion Chinese characters

The victory of the October Revolution in 1917 marked the beginning of a new era in human history, injecting new vitality into the film industry. Red themed films brought fresh color to film culture, and their ideological content influenced the global film industry, gaining favor among Chinese audiences [3]. When the first Chinese film, *Dingjun Mountain* (1905), was produced, China was still a semi colonial and semi feudal society. The film reflects the people's strong desire to reclaim their homeland. The original film was damaged in a fire, and it is uncertain whether subtitles were included. Ren Qingtai used rudimentary French equipment to shoot the film, and since *Dingjun Mountain* was a silent film, it is speculated that no subtitles were used. Ren Qingtai pioneered the development of China's grassroots film industry, and within three years, numerous independent film production companies emerged. In 1917, the Commercial Press purchased film equipment, enabling Chinese enterprises to acquire complete filmmaking equipment. During the silent film era, explanatory roles such as subtitles or explanatory notes were common. When Zheng Zhengqiu wrote screenplays, he would ask Bao Tianxiao to write the subtitles. Silent film subtitles were often achieved through the switching of text segments, as seen in the transition effect of letters in *Un Chien Andalou*, which was also validated in the opening scene of *Mulan Joins the Army*. In 1931, the first sound film, *The Songstress Red Peony*, was released, using wax disc dubbing technology. The opening scene created a visual illusion through changes in font size, and the Pinyin letters were presented with typewriter like animation. The font's position was also adjusted to make the text disappear with the horse-riding action, indicating that motion fonts in films evolved from simple show and hide effects to more complex forms, becoming one of the dynamic elements in film. After the failure of the August 13 Battle of Shanghai in 1937, the Shanghai film industry split into two factions. One continued patriotic film propaganda, while the other moved to the Guangdong Hong Kong region, awaiting the return of national territory [4]. From 1937 until the early years of the People's Republic of China, this period was known as the Fission and Reconstruction era in the film industry. After enduring hardships, the film industry entered a phase of diversified creation, producing works with different styles, such as *A Happy Reunion*, *A River of Spring Flows East*, and *Youthful Movies*. During this time, film opening subtitles often switched in a slide show manner until 1959, when *The Young People in Our Village* used a fan shaped transition effect, marking a turning point in the dynamic form of Chinese film subtitles. In 1962, the opening scene of *Big Li, Little Li, and Old Li* introduced a typewriter effect and font rotation, which was highly creative and laid the foundation for comedic effects, offering an innovative approach in Chinese cinema at that time.

The 1970s marked the beginning of the liberation era in Chinese cinema, with films like *Little Flower* addressing sexual awareness and *The Tremor of Life* introducing the ice breaking kiss, signaling a shift toward more open content exploration [5]. This era saw increasing expression of love and emotions in Chinese films. From the 1970s onward, the ideas of Western philosophers such as Freud and Foucault were introduced to China, blending with local

culture. In 1988, the opening subtitles of *Rock Youth* changed with the rhythm of the music, and the text's layout variation captured the audience's attention, echoing the rock theme. Following China's reform and opening, the country began importing advanced foreign film technologies, leading to a qualitative leap in film technology during the 1990s. Examples include the renovation of Dolby Stereo equipment at the Pearl River Film Studio, the emergence of panoramic water screen cinemas in China, and the premiere of dynamic films in Beijing [6]. Today, motion font design in domestic film openings has seen more interpretations thanks to new technologies. However, while technological advances have made design work easier, they have also led to increasing standardization of motion effects in commercial film openings.

The era of motion Chinese characters driven by animation technology

The animation industry has had a profound impact on motion design. Motion effects in film openings, both domestically and internationally, are often closely tied to content. In China, animation has incorporated national culture while also serving educational purposes, and its unique style is widely recognized. Today, digital media supports the diversification of the animation industry, enabling artists to use digital technologies to create new Chinese style animations, such as ink wash, paper cutting, and shadow puppetry, leading to the development of distinctive experimental animation. In addition, scholars have conducted extensive research on the integration of Chinese animation and motion typography. For instance, Fei Yuping's study "The Empirical Research on the Impact of Multimedia Presentation in the Channel Principle on Elementary School Students' Learning of Combined Geometric Area Calculations" examines the effect of screen text and animation on the academic performance of elementary school students. Chen Boguang's "Digital Life Evolution and Abstract Visual Creation Experiment Using Computer Animation to Interpret the Visual Imagination of the Divine Comedy" explores the reinterpretation of Dante's *Divine Comedy* through digital media, focusing on the relationship between text content and animation. Wang Yanquan's study "The Application and Regeneration of Chinese Calligraphy in Animated Works" examines the fusion of Chinese typography and ethnic animation. The mid-20th century was the golden age for film opening productions. Many iconic motion font openings, such as *The Man with the Golden Arm* (1955), *Pillow Talk* (1959), and *Psycho* (1960), were created during this time, leaving a lasting influence on the development of modern motion fonts.

In 1917, the Shanghai Commercial Press acquired film equipment, marking the beginning of China's path to independent film and television production. In 1922, the Wan Laiming brothers modified their equipment and created China's first advertising animation, *Shu Zhendong Chinese Typewriter*, signaling the emergence of motion graphic design in China. In the 1940s, motion Chinese character design made significant breakthroughs. In 1941, *Princess Iron Fan* introduced innovations in motion font design, using various effects to achieve the appearance and disappearance of text and smooth transitions, providing a creative paradigm for future works. In 1960, *Little Tadpoles Looking for Their Mother* integrated the painting style of Qi Baishi, pioneering experimental ink wash animation. Its motion form influenced later ink wash style animations such as *Big Li, Little Li, and Old Li*, reaching the peak of Chinese experimental animation in works like *Pastoral Flute*, *Mountain Scenery*, and *Deer Woman*. After the 1970s, the large-scale import of foreign animations boosted the quality and quantity of domestic animation, leading to the creation of classic TV animations such as *The Story of Avanti*, *Black Cat Detective*, and *Calabash Brothers*. Disney's "Twelve Principles of Animation" had a profound impact on domestic animation, enhancing the expressive power of animation through techniques such as squash and stretch and anticipatory action [7]. In early years, Chinese animation opening sequences were relatively simple, with basic motion text effects,

such as flipping pages or geometric mask transitions, synchronized with musical cues. After the 1980s, the development of computer technology allowed motion forms to closely integrate with animation content, such as using character actions to reveal text, or using music cues and camera movements to project text. In the early 21st century, text design became more complex, breaking text into modular components and combining strokes with anthropomorphic movements to convey meaning [8]. The overall development path moved from simple actions to layered actions, from isolated elements to composite combinations, from shape transformations to modular disassembly, ultimately achieving a composite motion effect that integrates text, images, and sound.

Motion Chinese characters in the contemporary cross media stage

For many years, books served as carriers of information, presenting linear content in a fixed paper format. The advent of screen display devices shifted reading from a two-dimensional plane to a three-dimensional experience, transitioning from page turning to sliding, and from browsing to audiovisual combination. With the rise of the internet, advertising shifted from print media to websites, television, and other new media platforms, creating a modern interactive media environment. Chinese characters, presented in code form on screen devices, have broken traditional forms of existence and promoted the development of Chinese character culture. Scholars have tackled the challenges of displaying Chinese characters online by deconstructing their structures and studying character information processing technologies. Based on application scenarios, motion Chinese character design can be classified into spatial interactive types and variable types, which will be discussed in more detail in the following sections [9].

Spatial interactive motion Chinese characters

In 1993, CoSA released the first version of the nonlinear graphics video editing software After Effects, which featured layer masking, special effects, transformation controls, and keyframe functionalities, enabling basic animation effects. This software could only achieve motion effects by manually controlling variables and adding a timeline to the text track. In 1996, Suguru Ishizaki designed a multi agent model for motion design, a theoretical framework that provided visual designers with a thinking model for motion design processes. Drawing from the concepts of dance, music, and other forms of improvisational performance, the design model analyzed multi agent systems in areas such as text, technology, space, and music, building a theoretical and technical framework. Based on this, interactive motion fonts can be categorized into random and parameter types based on their generation methods.

Random types do not restrict character shape data, and the shape is influenced by external computer data. For example, Touch Designer, developed by Hermanovic, uses node programming and operators to create random effects. Parameter types, on the other hand, generate regular influences on character shapes through limited elements, such as variable fonts and the motion Chinese character library auto generation algorithm developed by scholars like Pan Zhigeng at Zhejiang University. In spatial interactive motion Chinese character design, designs that focus on the pictorial function of Chinese characters as interactive elements are particularly popular among audiences. In 2019, Professor Chen Nan from Tsinghua University was invited to be the artistic director for the National Museum's Oracle Bone Script exhibition, where he created five sets of interactive oracle bone works. These were displayed through new media, interactive design, and art installations, showcasing motion oracle bone script and bringing the audience closer to the characters. Professor Chen Nan anthropomorphized the oracle bone script's pictorial features, using the body language of the characters to interpret their meanings, thus achieving a form-based expression of ideas [10]. In 2020, Huang Weijie completed a cross-media experiment using "Seven Body Evolutions" as an example. Zhao Han implemented narrative motion

effects in *The Thirty-Six Stratagems*. In 2021, Lin Shaoru proposed an imagery method to deepen cultural expression through multi-sensory experiences. These milestones signify that motion Chinese characters have evolved into multidimensional interactive forms, moving beyond mere surface level motion effects.

Variable Chinese font design

In the early 1990s, Adobe and Apple, based on Axis technology, developed the Multiple Master font and the TrueType GX font, respectively. Both fonts allow manual control of variables such as font weight and decorative line size within software. In the past, customers preferred list style font works from font library companies, and since variable fonts were not given much attention by developers and programmers, their development was limited. In 2017, Founder Type released the world's first Chinese three axis variable font, Founder Youhei, which allowed for variations in font weight, width, and height. In 2019, variable fonts became popular in the branding world, with Founder Type and Hanyi Font Library collaborating with brands to release custom fonts, showcasing their commercial value. In the same year, in September, Xiaomi launched the MIUI dynamic font system, sparking a trend for brand specific variable fonts. The popularity of variable fonts stems from their ability to provide users with customizable features, enhancing the user experience, addressing the issue of system font clutter, and driving the font industry toward a more diverse, interactive experience. As the variable font industry continues to develop, brand logos are also moving toward a path of variability. Since there are already examples of integrating motion technology with logos, it is certain that incorporating interactive design concepts and motion design into Chinese character logos will also result in new and innovative outcomes.

Conclusion

Motion Chinese characters use individual characters as the basic unit of design, incorporating the characteristics of time and space changes to present fonts in different motion states. Designers, based on animation principles, reinterpret the form and meaning of Chinese characters, combining the structure and semantics of characters. With the development of the film and animation industries, China has produced motion font designs with distinct Chinese characteristics. In early days, due to limited equipment, filmmakers combined text and images by cutting and layering film, with motion text only capable of horizontal and vertical spatial movement. After the founding of the People's Republic of China, text began to rotate, change in size, and incorporate special effects. As China's animation industry soared, motion fonts could be flexibly integrated with plot content and musical cues. Motion fonts evolved from a separate entity into a composite element. In the 21st century, the form and presence of motion fonts are no longer confined to small screens. They have transformed from mere textual graphic symbols into code, projected into space, and enabling interactive operations. This has revolutionized the traditional existence of text.

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Conflicts of Interest

The authors declare no conflict of interest.

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