Chinese Calligraphy in the Digital Realm: Aesthetic Perfection and Remediation of the Authentic

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Abstract
The fear that people are losing the ability to write by hand—carrying wider consequences with regards to culture, identity, and nationality—resonates widely in Chinese society. Due to the worldwide shift towards digital communication technology, the method by which an increasing number of people write Chinese characters has changed. Touchpads, mobile phones with software that allows one to choose characters from a list in pinyin, and voice recognition all reduce the time actually spent writing characters on paper. Practicing calligraphy offline is regularly hailed as a remedy to combat the demise of the written character. Arguing that media practices have always been subject to the material conditions of technology, this article contextualizes calligraphic practices occurring within new media as remediations of earlier practices. The digital realm, I suggest, is not a separate space, but part of the social totality of the everyday in which quotidian calligraphic practices can occur. Through an examination of calligraphy apps, an online calligraphy exhibition, the CADAL (China Academic Digital Associative Library) database, and personalized calligraphic fonts, this article endeavors to be an initial exploration of online calligraphic practices. I contend that rather than forming a rigid binary relationship with traditional calligraphy, these practices can be imagined as remediations, and as such, can generate inventive deviations from the dominant idea of what calligraphy is or should entail.

Keywords
calligraphy, remediation, the everyday, digitization, new media

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Digitalization transfers this aura to the individuated copy. Artist and viewer perform together. The dead replica and the living, authentic original are merging, like lovers entwined in mutual ecstasy.

—Douglas Davis
“The Work of Art in the Age of Digital Reproduction”

With the rise of the information age and the increased popularity of computers and mobile phones, people begin to get accustomed to the keyboard, thereby alienating themselves from ink and paper. This results in people spending less time writing Chinese characters. Currently the problem is not how to write a character beautifully, but to pick up the brush and simply remember how to write the character (提筆忘字; emphasis added).

—Sun Qiang
“Calligraphy Education in the Classroom”

Prior to the above lament regarding the demise of Chinese handwriting, made by Sun Qiang in April 2013, a notice was distributed by the Chinese Ministry of Education stating that Chinese calligraphy education would become a national curriculum course at primary and middle schools (MOE). One of the goals, the outline read, was to “inspire a passion of loving Chinese characters and learning calligraphy, cherish the great traditional Chinese culture, and enhance cultural confidence and patriotic emotion” (MOE).

Due to the worldwide shift towards digital communication technology, the method by which an increasing number of people write Chinese characters has changed. Touchpads, mobile phones with software that allows one to choose characters from a list in pinyin, and voice recognition all reduce the time actually spent writing characters on paper. As a consequence, the fear that people are losing the ability to write by hand—carrying wider consequences with regards to culture, identity, and nationality—resonates widely in Chinese society.

1 Calligraphy

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1 According to a survey conducted by HorizonKey in Beijing, Shanghai, Guangzhou, and Wuhan last year, 94.1 percent of the respondents had encountered the tibiwangzi syndrome (forgetting words while writing with a pen). Founded in 2000, HorizonKey is an international independent research organization, based in Beijing, China, that focuses on public opinion and social and cultural studies. See Wu Yixue. Another online survey conducted by Tencent, a
practice can combat character amnesia, according to the Ministry of Education (MOE). Facilitating better and more frequent calligraphy classes for children, national and regional calligraphy contests, and more lectures and exhibitions by well-known calligraphers are listed as solutions by the MOE. These proposed solutions can also be found in abundance on discussion boards on the Internet, and are activities that mainly take place offline, while ironically the problem—most people agree—is a direct effect of modern communication technology (Long and Huang). Although some propose to “work together” with new technologies to solve the problem, the division between the assumed culprit (communication technology) and the solution to the problem (analog methods) emphasizes the alleged dichotomy between online and offline worlds.

The moral panic over the loss of writing is tied closely to a fear of losing an essential part of culture, or even the culture itself. Benedict Anderson maintains that the written language of a nation is instrumental for national identity, as it creates an illusion of a national community (28, 55). Gunther Kress adds that

Writing is such a potent metaphor for culture in general, that the move in the current landscape of communication from the dominance of writing to the dominance of image in many domains has given rise, understandably, to much anguish, soul-searching and deeply pessimistic predictions about the future welfare of civilization. (54)

According to Andrea Bachner, this is especially accurate in the Chinese context, where “a multiplicity of regional languages and dialects was pitted against a highly standardized written form: classical Chinese” (5). She goes on to quote David Damrosch, who maintains that China “has had a national script rather than a national language” (207). Until recently, this “national script” was written with brush and ink: calligraphy (書法 shufa). The term itself implicates artistic skill and, according to Yuehping Yen, “abides by (or with a clear intention to) the set of brush techniques and aesthetic criteria that have been firmly established in the history of Chinese calligraphy” (28). Calligraphy as a writing method, as well as a longstanding high-art form, is increasingly transforming itself into a separate sphere as a direct result of its growing detachment from elitist practice (Kraus 149). Richard Kraus argues that “since the last decades of the twentieth century
calligraphy is reaching deeper into society than ever before, for ordinary Chinese also enjoy its pleasures and savor its connotations of upward mobility” (151).

Taking these arguments into consideration, I am interested in the social affordances of calligraphy, with the assumption that calligraphy is, as Kraus argues, increasingly happening within the everyday. Following Michel de Certeau’s arguments in *The Practice of Everyday Life* and *Culture in the Plural*, I conceptualize the everyday as the space where creative moments occur outside the dominant rationale, holding the potential to form “irruptions, deviations, that is, all these margins of an inventiveness from which future generations will successively draw their ‘cultivated culture’” (*Culture* 137-38). I understand the dominant rationale in this context as the field of traditional calligraphy and its association with writing and the high arts. Emerging quotidian calligraphic practices, such as water calligraphy (地书 *dishu*), as well as calligraphic explorations in modern art, like the works of Gu Wenda (谷文達) or Xu Bing (徐冰), can be understood as inventive interruptions; they hold the potential to creatively rearrange traditional practices and make imaginable a calligraphy practiced differently. Rather than forming a rigid binary relationship with traditional calligraphy, these practices can be imagined as inventive deviations from a dominant idea of what calligraphy is or should be. The digital realm, as I will show, is seen here not as a separate space, but as a part of the social totality of the everyday in which quotidian calligraphic practices can occur.

The current global environment, in which “the digital” is gaining ascendancy, has been likened to a social cultural upheaval, and is described in terms of a “revolution” or “disaster” (Bolter, *Writing* 19), the “death of distance” (Cairncross 2), and a “technopoly” (Postman 71-72). The pros and cons of a society increasingly saturated by computerization and digital technology are being heavily debated. What will happen to writing when everyone reads, but people spend decreasing amounts of time writing? Can the transfer from ink to pixels be defined as a transformation of the Chinese writing system? I raise the question about calligraphy being presented via the computer screen, how that translates back to analog calligraphy, and importantly, how the calligrapher is affected by these changes. How does the calligrapher move and act—as an artist, hobbyist, connoisseur, or consumer—before and after digitization? How does digitization affect the way in which both connoisseurs and amateurs read and experience calligraphy? Following Dominik Schrey, I am less concerned with the technical differences between the “analog” and the “digital” than with the affective affordances of these respective fields (28). Given that the digital offers a growing
platform to present, represent, and remediate forms of calligraphy, it is necessary to explore what remediated digital forms of a calligraphic character might be and how we should approach these signs. Should they be understood as useless skeuomorphs, reminiscent of an earlier “authentic” sign, as a “digitally assisted genetic mutation of Chinese” (Bachner 202)? As a marker of the adaptability of the script, made possible through “creative everyday deviations” (de Certeau, Culture 137-38)? Or as “remediations” (Bolter and Grusin 5), and therefore as a possible savior of the script so many are so fearful of losing?

Stepping back from the anguish over the alleged demise of analog writing practices, it is necessary to determine what is happening with Chinese calligraphy as an artistic and literary practice in a society where the digital realm continues to expand. Currently (as of June 2016), there are 710 million Internet users in China, which has an Internet penetration rate of 51.7% (CINIC). I do not attempt to provide a comprehensive overview of calligraphy in the digital realm, as this would require more wide-ranging research, but rather a first exploration of what is happening to calligraphy during an era of media transition. It is my assumption that calligraphy adopts aspects of new media practices: some are a creative adaptation of earlier practices, while others are born in the digital realm and made possible by new technologies.

In the following section, I will first expound on the relevant theoretical debates regarding remediation in new media, as well as issues of authenticity, in order to subsequently discuss these new media practices, as related to calligraphy, through two broad methods. It is important to realize from the outset that whenever we encounter calligraphy on our screens, it has been brought there by one of the following two methods, the first facilitating the development of the latter: (1) scanning, or (2) encoding through vector graphics, handwriting recognition, or texture mapping. Both methods have their (dis)advantages: scanning and uploading can be time-consuming and allows one to view the calligraphy as a static image, whereas encoding schemes enable computer users to edit, manipulate, and digitally process the graphic information (Zhao 364).

Within the framework of scanning and encoding, I selected digital objects based on a literature review and the careful examination of its relevancy. The “digital object,” however, is problematic by definition. By taking what is online as an object that can be critiqued in isolation from its environment, one runs the risk of ignoring the offline practices in which these practices and objects are embedded. David Berry notes: “it is not that we should be thinking solely in terms of ‘digital object’ but rather that we must be able to dialectically think in relation with a
number of moments within instantiations of the digital” (‘Interview’ n. pag.).
Adopting this point of view, a careful analysis of these objects allows us to explore
how calligraphy in the digital space is stored, (re)created, and at the same time
occurs in the quotidian life of Internet users as an instantiation of the digital,
perhaps as a digital recreation that simultaneously involves the consumption,
transformation, and creation of calligraphic works.

I will illustrate each method with two case studies. In the section on digital
scanning, I scrutinize the online calligraphy database—The China Academic Digital
Associative Library (CADAL 大學數字圖書館國際合作計畫 Daxue shuzi
tushuguan guoji hezuo jihua), and the online exhibition of the National Art Museum
of China in Beijing—“Heritage of Calligraphy—Invitation Exhibition of
Contemporary Calligraphy in NAMOC” (中國美術館當代書法邀請展 “Zhongguo
meishuguan dangdai shufa yaoqing zhan”) to shed light on how digital archiving
allows for the wider visibility of calligraphy and the means by which users engage
with these remediated calligraphies. The second section, concerning digital
encoding, will first give an overview of the work performed by computer scientists
to develop digitally simulated brush strokes, and then zoom in on the affordances or
action possibilities of those simulations: tailor-made calligraphic typefaces that
visually approach analog calligraphy, but are still unmistakably “digital.” How
these Chinese characters negotiate between the aesthetic principles of analog
calligraphy and digital imagery will be further scrutinized through an example of
typeface design.

Remediation and Digital Authenticity

It has become commonplace to call the time we live in the “digital age,” and
indeed it is hard to overstate the permeation of digital practices and new media in
our everyday lives. In the 1990s, early scholarship in the field of Internet studies
highlighted the Internet as a newly emerging separate space and celebrated the
democratic potential this new virtual realm could put forward (e.g., Rheingold).
Research on online communities, Internet-based political action, and cyber-
nationalism, to name but a few, demonstrated how this new virtual realm—in the
early days, often understood as a non-physical space—could redefine politics,
communities and identities. The idea of the Internet as a realm separate from the
real world was subsequently challenged by Daniel Miller and Don Slater in 2000,

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2 See, e.g., Rheingold; Ginsburg; Yang.
who argue, using a case study on Internet usage in Trinidad, that an online/offline divide is untenable. They maintain that rather than creating new cultural practices and virtual communities online, Trinidadians appropriate the World Wide Web and deploy it to suit and advance their own cultural practices. Miller and Slater suggest that this is a generalizable theory: “we need to treat Internet media as continuous with and embedded in other social spaces, that they happen within mundane social structures and relations that they may transform but that they cannot escape into a self-enclosed cyberian apartness” (5). This reiterates the earlier statement made by Berry, who argues that because digital media are not a separate space, digital objects also do not come out of nowhere to disrupt our analog lives. If we are to understand how computation is now part of the “social totality,” rather than looking for “digital objects” outside of it, we should develop a “holistic understanding of the interconnections and relationships that technologies introduce into everyday life and action” (Critical 13).

The question then arises, what happens to cultural practices that do not seem to lend themselves very well to the medium of the screen? Chinese calligraphy is a case in point: traditionally associated with analog tools, such as brushes, ink, inkstones, and paper (文房四寶 wenfang sibao), it is challenging to envisage how digital platforms might create, manipulate, or transmit such an art. This is where the idea of remediation becomes relevant. Jay David Bolter and Richard Grusin assert that new media are best understood by looking at the ways these media “remediate” and refashion earlier practices, arguing that “no medium today . . . seems to do its cultural work in isolation from other media, any more than it works in isolation from other social and economic forces” (15). This extends to their idea that traditional media, as well as new media, are now both trying to reassert themselves, appropriating bits and pieces from one another in order to refashion what is old, while the old, in turn, reaffirms its status to answer the challenges of new media. I can offer an example of this interconnectedness: my calligraphy teacher in Beijing happily embraces a website whose database generates calligraphy samples from masters in Chinese calligraphic history.³ What one needs is to select the style, calligraphy master, and font size, and the characters appear on the screen, allowing my teacher to download the text and hand-copy it directly from the screen with brush and ink. She uses this to enhance her traditional brush and ink calligraphy, and ironically does so in a calligraphy school established to combat the alleged

threat new media poses to handwriting and calligraphy.

Both new and traditional media, Bolter and Grusin emphasize, work along two principles of remediation: immediacy and hypermediacy. The first principle dictates that media are trying to create a sense of presence in what is represented. In order to achieve that, the medium should disappear as much as possible. For example, a Hollywood film should be shot on location with accurate historical details so the viewer has a sense of really being there (Bolter and Grusin 5), or digitally simulated calligraphic characters should be almost identical to brushstrokes made on paper. This desire for immediacy, for an experience without mediation, is counteracted by hypermediacy, which makes the user constantly aware of the media s/he is using. They argue that in the attempt to make the medium disappear, the medium paradoxically becomes even more apparent. For instance, a webpage containing mixed media, video, sounds, and hyperlinks constantly reminds us that we are in the presence of multiple media. Such a webpage “acknowledges multiple acts of representation and makes them visible” (33-34).

In the assemblage of immediacy and hypermediacy that makes up the principle of remediation, the question of authenticity arises. Mark Deuze argues that we reproduce digital culture alongside a change in our perceptions of reality and perhaps authenticity (66). What is real and what is unreal becomes an agonizing question in the age of new media. Walter Benjamin’s famous concern over the loss of the “aura” of an artwork in the modern age resonates here: can what is reproduced mechanically still be considered authentic? A reproduced artwork, Benjamin argues, lacks presence in time and space, and therefore a unique existence. It also depreciates the original work, which loses its authority along with its authenticity. On the other hand, he lauds the democratic potential of the new art forms that the modern age brings, making it possible for the masses to be involved in art, culture, and politics (Benjamin 9-10).

What “authenticity” means in the context of calligraphy is far from a contemporary concern. Calligraphy has survived by the grace of a widespread copying (臨摹 linmo) culture, by way of techniques such as tracing lines, rubbing stone steles, and the exact and creative copying of the ancient calligraphy masters. A vast field of research in calligraphy, Chinese painting, and seals concerns itself with questions of authenticity and connoisseurship. When Benjamin maintains that art has always been reproducible, calligraphy is a case in point. Although the adaptation, integration, and assimilation of new tools, writing surfaces, cultural shifts, and societal changes has changed general ideas about the purposes and
appreciation of different kinds of calligraphy, Chinese calligraphy has remained strikingly homogenous in both form and shape. The representation of what is already there is what shows the artistic skill of the artist/writer. Authenticity, then, should be sought in the execution of the calligraphy: the choice and interpretation of models, the speed of the brush, and the display or deliberate disguise of personal expression or spirit. The traditional belief in graphology—one’s character can be seen in the way one writes (字如其人 zi ru qi ren)—is attributed to the notion that authenticity is found in execution rather than choice of subject. Calligraphers have always navigated between the copying of a model and the use of “personality” and “own style” in their works, a balance dictated by the ruling regime and tastes of the scholarly elite of the time. While calligraphic copying culture to this day is still based on manual reproduction by a skilled calligrapher, the challenge for digital reproduction to produce something authentic lies in the affordances of digital precision. There is thus a clear contrast between the digital and the analog: while coding and scanning produce a hyperreality of digital sameness, analog requires the subtle addition of variation, which is achieved through the aesthetics of imprecision. We will see how digital reproductions negotiate this dialectic.

The question of the authenticity of calligraphic works brings us first to the current task of online preservation through scanning. The need for calligraphic models for the purpose of practice and teaching, as well as for research and connoisseurship, has extended to the digital realm, where an ever-increasing volume of images from art collections has become available in the last decade to everyone with access to the Internet. How these artworks are preserved and remediated in the CADAL database and the National Museum of Art in Beijing, and how that affects their authenticity, is the subject of the following section.

Calligraphy Scanning

Nowadays, anyone with a mobile phone camera can go to a museum, take a picture, and upload it to the Internet, where it can take on any shape or form: the sociotechnical affordances of the Internet have allowed for the retrieval, preservation, dissemination, and consumption of digital artworks and images. In order to keep up with these challenges, institutions like museums and libraries have been making a great effort to digitize their objects, images, and records. G. Wayne Clough states that archives and libraries were one of the earliest to adopt an “open

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4 See also McNair 1, 2.
“access” approach, leading to “a shift in focus from dispensing information to facilitation and assistance.” The lesson to be learned, Clough argues, is that there “is place for both the physical and the digital, with one complementing and leveraging the other” (4).

CADAL is an example of such an effort. In 2002, it started to build a digital academic library through the scanning of paper books, providing digital access for learning, teaching, and research-support purpose (“CADAL”). CADAL had digitized 2,757,413 books as of December 2015, of which 237,999 are ancient books from before the Republic of China (1912–49), many containing calligraphy (CADAL). It allows the Internet user to browse ancient calligraphic works based on time-period and calligrapher, and to search for separate characters within the works. A digitized image can be magnified to study traces of ink and wrist movements, and can be compared, shared, and classified to answer questions on authenticity and written content. Visitors can be asked to help identify unknown characters and globally dispersed researchers can communicate more efficiently because the images are reproduced and made visible to many people simultaneously.

Fig. 1. A still from the CADAL calligraphy database.
Looking at the CADAL webpage that features single calligraphic characters, the double logic of remediation explained by Bolter and Grusin becomes evident in the efforts to create an “authentic” experience of the ancient works. Around the edges of the webpage, we find faded traditional calligraphy on a beige surface that reminds us of aged xuan (宣) paper (the type of paper that is commonly used for writing calligraphy), calligraphy brushes, and inkstones. In the top left corner a calligraphic typeface spells out “calligraphy” (書法 shufa). Within the black-and-white frame containing the scanned images of the calligraphy, we find an illustration of a man wearing the archetypal garment of a scholar, which has indicated the status of a member of the literati since the Tang dynasty. Interestingly, the calligraphy section of the CADAL website remains the only section featuring these types of “visual reminders” of the analog; perhaps this is an attempt to ease the tension between the analog skill and its remediated online counterpart. Then the scanned digital characters in the tab “calligraphic character” (書法字 shufa zi), black on gray in color, appear for each character, accompanied by digital typefaces explaining their origin. The webpage is a constant dialogue between the remediated and the authentic. The elements of “authentic” calligraphy (silk, inkstone, brush) are counteracted by the hypermediated website in which the ancient characters are embedded: hyperlinks and even video animations make the user acutely aware of the medium. It appears to be a hodgepodge of signals—the Internet user is pulled back and forth between the “real” and the digital.

Archiving, storage, and ultimately, the enjoyment of calligraphy in the digital realm have been made possible not only through scanned manuscripts. The National Art Museum of China in Beijing has expanded its public service content through the establishment of a “digital museum” project in which artworks, as well as the museum space itself, are digitally reproduced. The online exhibition “Heritage of Calligraphy—Invitation Exhibition of Contemporary Calligraphy in NAMOC” starts with a black loading page that features a calligraphic typeface spelling out “The National Art Museum of China.” Then online visitors suddenly find themselves in a crystal-clear video representation of the actual museum space just outside the elevator, and are able to walk around by moving an arrow with their mouse.

Multiple features have been added to equate the experience as much as possible to a physical, “real” experience. Without moving the arrow, the screen moves by itself at a slow walking pace through the museum, passing every piece of calligraphy. This creates the sensation of immersion that Bolter and Grusin term “immediacy.” If the visitor wants to stop and take a closer look at the calligraphy,
the arrow can be placed on top of the work, changing the view to a different screen featuring the single work and its details. The calligraphic work can here be understood as a hypertext: the artwork is directly accessible through a link embedded in its image. A heart icon in the upper left corner allows the visitor to like the work and share it immediately with friends on social networks such as Douban (豆瓣), Renrenwang (人人網), or Weibo (微博). These efforts to get as close as possible to the “real museum experience,” however, lead to hypermediacy: the intense awareness of the medium. This is most prevalent in the panelled display of the featured artwork, as well as the “share and like” button at the top left of the webpage.

Fig. 2. A screenshot from the online exhibition “Invitation Exhibition of Contemporary Calligraphy,” held at the National Art Museum of China in Beijing, 23 January 2016. By clicking on one of the artworks, the work appears in isolation on a black background, with the details of the work and “share and like” buttons.

The spaces of brick-and-mortar museum, where calligraphy lives, have expanded to reach an online audience, allowing anyone to move through them to interact with objects. One of the implications is that museums no longer close at
five o’clock, and are increasingly “on demand.” Opening and closing the museum with the click of a mouse renders a feeling of private ownership and physical closeness not only with regard to the museum, but also the artworks on display: you are the only one there to witness them. Within these projects, both in the CADAL database and the digital museum project, we see two opposing desires reoccurring: the desire for transparent communication with the supposedly real, and a fascination with the possibilities that new media offer us.

A third strand of online calligraphy archiving struggles with the same opposing desires. The feeling of physical proximity generated in digital museums is even more palpable in the reproduction of calligraphic artworks in calligraphy learning apps. Searching the app store for “calligraphy” in Chinese (書法 shufa) reveals hundreds of calligraphy-related apps that are available both for IOS and Android. These calligraphy apps range from tutorial movies to calligraphy dictionaries. Learning apps that specialize in steles and rubbings, clerical scripts, grass scripts, or the calligraphic styles of the well-known calligraphers Wang Xizhi

Fig. 3. A still from the online exhibition “Heritage of Calligraphy—Invitation Exhibition of Contemporary Calligraphy,” held at the National Art Museum of China in Beijing, 23 January 2016.
(王羲之) and Yan Zhenqing (顏真卿) suggest a wide demand to learn, share, and also create calligraphy through digital methods.

José van Dijck describes how, with the rise of Web 2.0, users have increasingly moved their activities in everyday life to digital environments (6). Social media platforms and their apps permeate more and more of our daily lives, not only by facilitating activities that would otherwise have been ephemeral and private, but also because, as van Dijck argues, “the construction of platforms and social practices is mutually constitutive” (6). Calligraphy apps exemplify this idea.

The app *Ink Pool* (墨池 *Mochi*), for example, China’s first mobile calligraphy community platform, currently boasts 200,000 registered users. As a spin-off of the popular calligraphy website shufawu.com, the app is a space for the users to demonstrate their calligraphy skills, to learn (by adding the hashtag: “qing dajia paizhuan!” 請大家拍磚！ [“please criticize!”] to their work), and to be seen by others. This is exemplified by the prescription of the app that reads: “You want to give yourself a solo-exhibition that never ends? Distribute your works through *Ink Pool* and set up your own solo-exhibition with your own topic, for example #Xiaomings exhibition#, and thousands of calligraphy lovers will see your work. You can enjoy the attention of a wide audience! (*Mochi* n. pag.)

![Fig. 4. Three screenshots from the app *Ink Pool*.](image)

The first screenshot shows a piece of seal script (篆書 *zhuanshu*) calligraphy. The second screenshot shows the bidding feature on the app, and the last screenshot displays calligraphy that was rated “hottest” over the previous 24 hours. Screenshots taken on 24 April 2017.
This app does not include a tool to create digital calligraphy; users upload photos of their brush-and-ink calligraphy, created offline, to give it an online platform. This “offline to online” move shows a fluid interaction between the natively analog and the digital, underscoring Miller and Slater’s idea that online practices are embedded in offline practices. This idea is also apparent in the app’s ability to purchase calligraphic works on paper from co-users and “friends.” Through a bidding scheme, app users can bid against each other for calligraphic works that will be sent by post after purchase.

This commodification of homemade calligraphy also begs the question of ownership structure and implies a hierarchy, not between professional and amateur calligraphy, but between the digitized copy and the authentic “real.” Although the app is free, and thousands of works are available online, the authentic copy remains the commercial feature of the app (besides profits derived from advertising). Van Dijck argues that tactics such as the popularity principle and ranking mechanisms that allow for bidding are “firmly rooted in an ideology that values hierarchy, competition, and a winner-takes-all mind-set” (21). In this capacity, *Ink Pool* appeals to all users—hobbyists and professionals—and all are invited not only to create, but also to take something from it offline. It delivers the promised advertisement mentioned earlier: a solo-exhibition with thirty thousand visitors, and you can be the one to take the “authentic” home.

What I have highlighted so far is how calligraphic data—scans or photos—are digitized to render them reproducible (and thus allow their distribution, research, sharing, and enjoyment) in the online environment. They are, however, not what Richard Rogers terms “natively digital” (1, 4): the works were not created in the digital realm. Although a computer aided in the reproduction of the work, the authentic copy was created offline, where it still remains. The following section will discuss what could be described as natively digital calligraphy: a strand of research devoted to developing digital brush strokes for the creation of analog-looking characters and personalized typefaces. I will probe these advancements and their negotiations of authenticity, analyzing how these Chinese characters navigate between old aesthetic principles and the digital imaginary.

**Brush Simulations**

Several impediments make the digitized simulation of Chinese calligraphy particularly challenging, and methods to retrieve separate calligraphic characters to use as a prototype have proven difficult to generate. Techniques such as Optical
Character Recognition (OCR) and Handwritten Character Recognition (HCR) digitize typed, handwritten, and printed text so that they can be edited, stored, searched, and displayed digitally. The shape and topology of a calligraphic character, however, are more complex than ordinary handwritten text. Brushstrokes within a character can be very complex due to the nature of calligraphy: strokes are often unpredictable in shape, and wide variations in calligraphic style and stroke size make manual input impossible. Moreover, scanned historical characters from stone steles often contain excessive “noise,” such as stone degradation, that has to be filtered to create general properties of the characters that are extractable and utilizable as a statistical model. Calligraphy is, as Songhua Xu et al. put it, “type fonts on the loose” (14). Another complication is the large character set of Chinese script. Retrieving (ancient) calligraphic characters is only possible when their analog characters have digital counterparts. Up to the end of 2016, 80,388 Chinese characters had been encoded in Unicode (Tsu n. pag.). In 2011, the Chinese government, together with nearly thirty universities, research institutes, and enterprises, embarked on a digitization project named “China font bank” (中華字庫 Zhonghua ziku), aiming to digitize another half million Chinese characters that are currently not available in digital form. This section of a larger project will make code available for ancient characters and the characters used in languages of ethnic minorities. As Jing Tsu puts it, “[c]haracters that have long resided in the dusty pages of old manuscripts will come to life in the digital medium” (n. pag.). A reiteration of the earlier stated premise, that both the online and the offline make up and influence our daily reality, is seen in the everyday difficulties encountered by Chinese people with uncommon names. It is virtually impossible for people whose names have not yet been transferred into digital code to purchase train tickets, graduate, or obtain an ID card (Tang). At a more general level, the deputy director of the General Administration of Press and Publication, Sun Shoushan, stated at the outset of the project that the developments will “help China lead the way in the information and digital era, will improve the execution of Chinese cultural soft-power and have great strategic significance” (K. Wang n. pag.). The long association in China of power and the written word drives projects such as these; when power and writing are so closely related, it makes good sense to fill up the digital realm with as many Chinese words as possible for the execution of (national

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6 See Su et al.; Zhang and Nagy; Lu et al.
7 This project is listed as one of the larger projects in the “Outline of the Eleventh Five-Year Plan for National Culture Development” in 2006 and was included in China’s “Plan on Reinvigoration of the Cultural Industry” in 2009 (according to developer Founder International).
as well as international) soft power.

For calligraphy simulations on the digital screen, computational science specialists have spent the last two decades developing methods to recreate the movements of the hairy brush (initially called the e-hairy brush), the layering of ink, and the behavior of the ink on paper. “Though a computer cannot capture the creative spirit of an artist, it can simulate the brushstroke characteristics that are so important in its manifestation” (Su et al. 1). This rather optimistic note is the start of a study by Sara L. Su et al., which presents a novel way of simulating calligraphic brush strokes through a model based on a “parametric curve” (85, 86).

![Image](image)

Fig. 5. Real versus simulated strokes: (1), (3), (5), and (7) are simulated. (2), (4), (6), and (8) are real (Girshick 30). Courtesy of Ross B. Girshick.

Steve Strassman was the first to develop a method to digitally mimic the behavior of a brush and the deposition of ink on paper. Resulting in brush-like strokes, this approach is, however, time-consuming and not applicable for drawings with many different strokes. A second approach to imitating analog brush strokes is the “skeletal strokes” method, first introduced by Siu Chi Hsu, Irene H. H. Lee, and Neil E. Wiseman in 1993. This technique allows a stroke or image to be scaled, transformed, and textured at a control point. Helena T. F. Wong and Horace H. S. Ip advanced this further by generating a virtual brush that is able to capture 3D geometric parameters, brush hair properties, and ink variations. Ross Girshick then proposed a Parametric Hairy Brush (PHB), especially designed to realistically imitate a Chinese brush. The main distinguishing property of the PHB is its ability to “simulate a wide range of stylistic effects ‘out of the box’” (Girshick 1). Jinhui Yu and Qunsheng Peng presented a framework in 2005 to specifically synthesize
realistic grass script (草書 caoshu) calligraphy through texture mapping, which is based on brush texture patches collected from handwritten artworks. They claim to be able to reproduce typical grass script strokes, brush variations, the wetness of the brush, and the amount of ink. The results are noteworthy, as the example below shows.

Fig. 6. The left panel shows a real artwork, the middle panel shows the digitized strokes with indicated turning points, and the right panel shows the synthesized image (Yu and Peng 150). Courtesy of Jinhui Yu and Qunsheng Peng.

The attention to detail required by scientists when developing a system to synthesize digitized calligraphic characters that resemble the “real” reveals a desire for immediacy or the “transparent presentation of the real” (Bolter and Grusin 21). “Real” calligraphy, all studies assume, is written with a soft brush and ink on paper. Interestingly, this does not necessarily mean that developers assume the “real” is also the best, or the most visually attractive. Xu et al. state that with computerized calligraphy, “for the first time, it is possible for the tool’s performance to surpass the skill level of the user” (5). The elicited result no longer corresponds to the skill level of the tool’s user, which brings us back to earlier questions with regard to immediacy and authenticity: if a digital application, given the right parameters, has the ability to surpass the user, who then is the artist? In their wide-ranging study on digital Chinese painting and calligraphy, Xu et al. introduce a method to generate
artistic Chinese calligraphy automatically. An algorithmic framework simulates the human process of learning calligraphy skills and makes it possible for the computer to synthesize new calligraphy automatically, based on these learned examples.

A final illustration of research in digitally generated calligraphy is the study by Cao Shi et al., who propose a five-layer framework to generate Chinese characters based on “calligraphic prior knowledge and visual aesthetics” (23-36). The generated characters, which are based on the handwriting of famous Tang dynasty calligrapher Yan Zhenqing, were mixed with Yan Zhenqing’s real, analog calligraphy, and shown to a test group of fourteen people. When the characters with the “worst visual acceptance” were picked, the results showed that the digitally generated characters received almost the same visual acceptance relative to Yan Zhenqing’s calligraphy (30). This indicates another tactic of remediation, where we see that the age-old tradition of modeling after the master continues in the digital realm, this time between man and machine—and he who models the master calligrapher best is most highly appreciated.

These types of simulated brush strokes serve two main purposes. First, they construct digital characters that can be used as a (personalized) font; second, they generate customized Chinese characters for “digital entertainment in cyberspace” (Shi et al. 24). Digital typefaces generated from the calligraphic writing of certain
famous individuals have become more widely available in the last decade. Actress Xu Jinglei (徐靜蕾), calligrapher Qi Gong (啟功), writer Lu Xun (鲁迅), and Chairman Mao (毛澤東) have that in common: their handwriting has been made into a downloadable typeface. Their calligraphy can now be downloaded and used by anyone, making their handwriting more visible than ever before. In an interview with China Daily, Qiu Yin, calligrapher and director of typeface design company Fangzheng, explains how Lu Xun’s typeface was created: “We gathered his manuscripts from museums and then chose about 2,600 characters, studied his style, and created the characters that could not be found or were illegible in his manuscripts” (qtd. in Xing 16.). According to the article, it took a team of four designers eighteen months to finish the project. “There is cultural significance in developing typefaces for renowned historical intellectuals,” Qiu Yin said. “Seeing their handwriting, people can draw inspiration and connect with them in a digital way that transcends time and space” (qtd. in Xing 16.). Interestingly, the digital is imagined by the developer not as impersonal, threatening, or unreal, but as a more durable method of preserving calligraphy.

Fig. 8. A typeface based on the calligraphy of Mao Zedong, developed by and retrieved from <4-designer.com>.

Fig. 9. A typeface based on the hard-pen calligraphy of Xu Jinglei, developed by and retrieved from <font.chinaz.com>.

Fig. 10. A typeface based on the calligraphy of calligrapher Qi Gong, developed by and retrieved from <diyziti.com>.
Chinese typefaces exist in numerous forms, varying from basic serif and sans serif to daring new creations and personalized calligraphic typefaces. China’s main typeface developer, Foundertype (方正字库 Fangzheng ziku), for example, features twenty-eight calligraphic typefaces on its website, with around 7,000 characters available per typeface. There are, however, far fewer complete simplified Chinese typefaces available for Mainland Chinese compared with English typefaces and other character-based languages, such as Japanese and traditional Chinese. According to design writer Elliot Richards, there are about fifteen complete fonts, of which two to four fonts are used 90% of the time (qtd. in Thiruchelvam n. pag.). The two most widely used typefaces are SongTi (宋体), a serif font, and HeiTi (黑体), a sans-serif font. The most widely used typeface in Mainland China, as well as the default interface typeface for Windows 95 to Windows XP, is SongTi typeface SimSun (中易宋体 zhongyi songti), often referred to as the Times New Roman of simplified Chinese. The SongTi typeface is easily readable and is used in the main body of texts on most of the well-known Chinese webpages.

I deviate at this point to elaborate on the SongTi design mainly to illustrate that calligraphy is deeply rooted in the origins not only of the digital typeface, but also of its predecessor, the woodblock typeface. The digital SongTi typeface is a digitized remediation of the woodblock printed characters popularized in the Song Dynasty (960-1279). The invention of woodblock printing in China for reproducing double pages goes back to the eighth century and reached its heyday during the Song dynasty due to government printing projects and the increasing popularity of civil service examinations, which created a widespread demand for reproduced manuscripts (Hang Lin 52). Hang Lin shows that woodblocks were initially carved through the careful copying of handwritten manuscripts in original calligraphy, modelled after the great Tang masters (57). Thick horizontal lines characterize the SongTi typeface, with a small serif on the top right and thin, straight, horizontal strokes.

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8 Chinese Type Design and Research Center (中国文字字体设计与研究中心 Zhongguo wenzi ziti sheji yanjou zhongxin).
9 Microsoft YaHei, the sans serif counterpart of SimSun gained popularity in recent years and is now also widely used in web layouts.
10 See, for example, <www.tudou.com> and <Ctrip.com>.
11 He adds that the more homogenized woodblock style now known as SongTi was actually created by the late Ming printers. This style was “supposedly based on the calligraphic style of some imprints of the Song dynasty, but with repeated application to woodblocks by ordinary craftsmen, it became more rigid and straight, and eventually transmogrified into the mechanical, nondescript calligraphy which came to be called ‘craftsmen style’ (匠体 jiangti)” (57).
with serif on both sides. The typeface has this shape because the current remediated form is directly related to its woodblock ancestor: the grain in the wood ran horizontally and made cutting thin lines easier; vertical lines ran counter to the grain and had to be wider, so they would break during the carving. Because the ends were prone to become worn, they were made thicker: a serif (Schaefer 1).

Bolter and Grusin’s assertion that the newer medium always builds upon the older medium again applies. The woodblock medium remediated its calligraphic predecessor to maintain legitimacy and became the new “real.” The new digitized SongTi acts in the same way. It has kept its dominant position—conceived of as the most convenient, real, or authentic typeface—among the typefaces: even in the digital, it remains the most widely used form.

**Conclusion**

I started out by stating that there is a widespread fear that calligraphy and handwriting might be lost in the processes of cultural digitalization. This article was intended to intervene and give a brief tour through the digital realm to understand what happens with and to calligraphy. A binary distinction between what is real and what is digital has quickly proven untenable. As the real world is increasingly augmented with digital information, it is safe to say that digital space is not happening “elsewhere” (Schneider 87), but is increasingly interwoven in quotidian life. In this everyday digital environment, we find calligraphy museums to visit, numerous ancient calligraphy reference books to browse, calligraphy friends to meet, and calligraphy auctions and exhibitions to attend. We learn to copy from the screen, we can see calligraphy simulations that are rated as good as Yan Zhenqing, and we can write a blog post with the grass script of Mao Zedong. Moreover, the range and scope of calligraphy available to Internet users, perhaps previously excluded from such sources, has grown enormously thanks to easily accessible digital databases and online museum projects. It is conceivable that even non-
canonical primary sources now have a chance to be (re)discovered and researched, potentially creating a shift in understanding what representative or “good” calligraphy is.

Online digital reproductions of calligraphy raise the question of authenticity. In considering what the reproduced copy might lose in the process of digitization—aura, authority, or expressiveness—it is useful to ask if other copies of the manuscript exist, and how important the role of authenticity is within the culture in which the artwork is embedded. The longstanding practice of copying the work of a master suggests a more relaxed attitude towards copying and reproducing. What infuses a calligraphic copy with aura or the elusive notion of spirit (神 shen) is far beyond the scope of this article, and I will not risk making any statements regarding that. Moreover, the affective affordances of digital calligraphy have yet to be researched. The difference between a manual copy and a digital copy becomes more pertinent when considering the corporeal aspect of calligraphic reproduction. We have seen how digital calligraphic websites attempt to incorporate—or remediate—elements to enhance bodily involvement by implementing interfaces with analog characteristics. Smartphones and apps employ touchpads, digital brushes, and new technologies that allow for finger writing. These technologies mimic and even predict the movements of the finger to create a feeling of corporality, while share and like connectivity enhances the sensation that there is more than you and the computer screen engaging in calligraphy. The development and employment of calligraphic typefaces might be motivated by a desire to live a “literate life in the information age” (Selfe and Hawisher 1) by connecting with ancient calligraphers through a typeface, regardless of the medium. It seems that the calligrapher, the connoisseur, and the hobbyist are rather enriched by advancements in the digital, but it is up to the users how to negotiate and appropriate the involvement of these digital tools and options in their quotidian calligraphic habits (van Dijck 6). It is therefore more accurate to speak of dispersal rather than a shift of sociability and creativity to digital environments.

I stated in the beginning that the digital might be imagined as an extension of everyday life, holding the potential to creatively rearrange traditional practices and thereby making imaginable a calligraphy practiced differently. But what if digitization projects and calligraphy apps make us nothing more than passive consumers of images? Michel de Certeau has argued how as a user—a consumer dislodged from the product—we seem to be nothing more than a passive receiver. However, de Certeau argues that “in reality a rationalized, expansionist, centralized, spectacular and clamorous production is confronted by an entirely different kind of
production called ‘consumption,’ and characterized by its ruses, its fragmentation (the result of the circumstances), its poaching, its clandestine nature, its tireless but quiet activity, in short by its quasi-invisibility, since it shows itself not in its own products” (*The Practice* 31).

By changing ordinary men and women from passive “consumers” of prefabricated productions into producers, makers of their own, de Certeau creates an opening for ordinary people, now often reduced to the role of consumers, to operate within a dominant culture, redefining and resisting on their own terms. The creation, enjoyment, and consumption of calligraphy in the digital realm may thus be theorized as an active and dynamic part of the quotidian life of Internet users that might rearrange the set of beliefs of what calligraphy is or should entail. The “real” and the “unreal” coexist until, I suspect, these alleged dichotomies become irrelevant. Or, as Douglas Davis suggests, “Artist and viewer perform together. The dead replica and the living, authentic original are merging, like lovers entwined in mutual ecstasy” (381).

**Works Cited**


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