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Akchessima: Latin Type Design for Digital Chinese (Seal Script) Typefaces

by Xuan Zhang

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Fine Arts in

Visual Communication Design
School of Design
College of Imaging Arts and Science
Rochester Institute of Technology

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Abstract

Akchessima: Latin Type Design for Digital Chinese (Seal Script) Typefaces

Xuan Zhang

As multi-language text layout and Chinese/Japanese/Korean typefaces have become an important topic in modern day typography, the visual match-making between Latin and Chinese writing is a very important issue in type design.

For this thesis project, Latin letters are designed based on a Chinese seal script style typeface, in seek of a design principle of matching Latin letter forms for Chinese calligraphic styles, originating from different writing tools and traditions.

There is not one universal principle that would apply on all different Chinese typeface styles. However, based on research of writing habits and technology, multiple methods have been developed in this thesis, which could be used while processing any type design projects.

Keyword: type design, Latin letter, Chinese character, seal script.
Approval

Akchessima: Latin Type Design for Digital Chinese (Seal Script) Typefaces
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Preface

This document about type design is a thesis project, but not only a thesis project to me. It has been a long time since I started the project, and now I have already been a professional type designer for 3 years. As your thought, this very project is the start point of my type design career, which I like a lot.

My job is exactly the same as the thesis – designing non-Latin alphabet for the Chinese typeface. Yes, my designs are always based on others’ designs, and I did them letter by letter for 3 years. Sounds boring? A little bit, not quite so, because there are much more beyond the job itself. As I devoted myself to type design & typography, I start to encounter a group of smart persons. During the past 3 years, I met technician working on CJK script, caster of metal types from last century, linguistic trying to save minor scripts from dying, and many more talented people. Understanding of Unicode and Opentype technology, language/script and their problems I never heard before, and the history of Chinese typography... I learned all these from them. It is really fantastic experience working with them.

They made me to think about what should I do to contribute to Chinese typography. So I would like to use this thesis not only to get a degree, but gather my experience and thought from these years, to provide an approach towards Chinese typography and information for new designers who have interests in this area as much as possible.

As a result, this thesis not only includes the whole design process, but also a lot of detailed tips on calligraphy and typography of non-Latin script (including Chinese). No matter you are reading this thesis as a committee, or looking for information for your project, or simply for interest in alien culture, I hope you enjoy this little book.

(For your information, in this thesis, footnotes are numbered in the old way: *, †, ‡, §, ||, #, **, ††, ‡‡, §§, ||||, ##...
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Chapter 1
Background Knowledge

This thesis is about match-making of two different writing systems, and will mention some historical writing styles of them. In order to make it more friendly to the reader of English, the Background Knowledge and Glossary sections are included at the beginning. Some details are further discussed in related chapters.

If you are familiar with both Latin and Chinese writing system, there is no problem for skipping this chapter.
1.1 The difference between Latin letters and Chinese characters

Latin letters are defined as an Alphabetic writing system, which uses a small set of letters representing phonemes of a spoken language. Though Alphabetic scripts denote sounds with letters, they do not usually apply a in a strict one-to-one manner. (Writing systems that use one character/letter for each syllable are defined as syllabic scripts, like Hiragana in Japanese.) Languages using Latin letters includes English, French, and German, etc.

Chinese characters are also named as Ideographic writing system, and widely used in East Asia’s CJK (China, Japan and Korean. Sometimes the phrase CJKV was used, because Vietnam used Chinese characters for a long time historically.) language area. Every Chinese character not only has its unique sound, but also has a meaning with it. In some way, a Chinese character could be treated as a word in the form of logogram.

Generally speaking, Latin letters are used in phonetic languages while Chinese characters are ideographic. For most of time, Chinese modern typography uses horizontal writing just like English, but it could also use vertical writing. In this thesis, the focus is on the horizontal writing style, the common part in both Chinese and Latin writing system. Whether the two writing systems could reach a visual harmony was the main area of research.
1.2 The definition of Simulation Typeface

A simulation typeface is one designed after a unique or stereotypical aspect of the letterforms or scripts of a different language.

For example, Lithos is a glyphic sans-serif typeface designed by Carol Twombly in 1989 for Adobe Systems. As it is inspired by the unadorned, geometric letterforms of the engravings found on Ancient Greek public buildings, it is a Latin simulation typeface to the Greek writing style by that time.

The thesis project is a Latin simulation type in respect of the Chinese Small Seal Script style.
1.3 Chinese and Latin Typeface Styles

For a better understanding of the topic, a compilation of a brief history of Chinese and Latin calligraphy was developed.

1.3.1 Timeline of Chinese Calligraphy

A timeline of Chinese type style is shown here, and only some specific milestones are highlighted to keep it brief.

**Oracle Bone Script**
*developed between 1200 BC – 1050 BC*

**Seal Script**
*developed around 250 BC*

**Clerical script**
*developed around 200 BC*

**Cursive Script**
*developed around 200 AD*

**Regular script**
*developed around 400 AD*

**Semi-cursive script**
*developed around 950 AD*

† Fig 1.4
The timeline of Chinese type style made by Li Xiangcheng. It contains both calligraphy and print type style, but it still gives us a whole picture of calligraphic style evolution.
Seal script (Zhuan Shu, or Zhuan for short), was defined as the first national standard style in China during Qin Dynasty (221-206 BC). However, just as its name “Seal” describes, it was mainly used on ceremonial inscriptions rather than as a standardized script.

Instead, Clerical script (Li Shu, or Li for short), which was developed as a hand-writing style, was then decided to be one of the standardized script style and widely used. Seal script serves as the parent style of Clerical script. The transformation from Seal script into Clerical script is call Li Bian, which means Li Transformation, is an important milestone of Chinese characters. It indicates a start point of “modern Chinese characters” that we use currently.

Fig 1.5
From top to bottom, they are in the style of Seal script, Clerical script, Regular script and Semi-cursive script. As you see, they are listed in the order of timeline. Comparing with Seal script, Clerical script is more visually similar to the style of the modern Chinese characters in Regular & Semi-cursive script.
1.3.2 The Four Main Categories of Chinese Print Typefaces

The earliest surviving sample of Chinese Woodblock printing date back to 868 AD. Around 1050 AD, during the Song Dynasty, the artisan Bi Shen invented printing with movable type, 400 years earlier than Johannes Gutenberg’s 42-line Bible.

However, Bi Shen’s movable types never took the main role in China’s history, while woodblock printing is continuously the main printing method in China. Modern Chinese typography with movable types was brought by the western publishers. (For details, please read the book Gutenberg in Shanghai: Chinese Print Capitalism, 1876–1937†).

As modern typography was introduced and localized in China, four main styles of (text) typefaces have been developed.


Song, also called Mincho in Japan, could be considered as a serif style. Just like the serif in Latin typefaces, it has a symbolic triangle element at the end of every horizontal stroke. Though Song style is often referred as the Chinese serif style, some people may argue if it is proper to use the western term “serif” on Chinese. It is the most common used style of type in Chinese.
Hei, which is called Gothic in Japan, is a result of the influence of International Typographic Style. Japanese type designers created the style with the inspiration from sans-serif Latin typefaces in the early 1900s, and China adopted this style from Japan.

Kai, which takes Regular script (Kai Shu) as its model, is a calligraphic style simulating the writing of a soft brush.

Fangsong or Imitation Song style, known as Songcho in Japan, is a very young type style. It first appeared as Juzhen Fangsong (聚珍仿宋) designed by Shanzhi & Fuzhi Ding (丁善之、丁辅之) in 1916 AD. The design concept of Fangsong is to create a style in model of the regular script type of woodblock printing in Song Dynasty. Though it is classified as one of the main style, it can also be treated as a kind of Regular script typefaces.
This thesis will not go into detail of the calligraphic hands, either. But based on the relation from Uncial to Carolingian Miniscule, Fraktur to Bastarda, it is not difficult to see a general evolution – from slow to fast and smooth writing.

And of course, Carolingian minuscule is the spotlighted as the milestone of the division of upper and lower case letters. The mixed-case text might seem quite normal to an English reader, but not that many writing systems are case-sensitive. Among the common-used writing systems, Greek and Cyrillic also have capital and lower case letters, while most of others might not, including Chinese.
1.4 Small Seal Script

Seal Script is a broad category of calligraphic styles. It contains bronze inscriptive writing, silk-based writing, Bird-worm Seal Script, Big Seal Script and Small Seal Script. Small Seal Script is specifically known as common “Seal Script” to the Chinese reading public. Though the name Seal Script (篆) originally meant carving, later its use was limited to personal and official seals. This was the origin of the name “Seal Script”. In seals, its style has changed over time, resulting in several variations, some retaining their original clarity and legibility, others becoming highly decorative but less legible.

The Seal Script focused in this thesis is Small Seal Script (as shown below in Fig 1.14). If a particular variant of Seal script is not specifically identified, Small Seal Script is meant.

![Fig 1.12 & 1.13 Different Samples of Seal script, with soft and hard turning strokes.](image)

![Fig 1.14 Specimen of a digital revived Small Seal script style font by Kinkido, based on the Taishan Inscription.](image)
1.5 Simple Character and Compound Character

Though Chinese characters are visually drawn as logograms, it has a built-in logic in making those characters. Generally, Chinese characters can be distinguished into two main categories—simple characters and compound characters. Chinese script is famous for its quantity of characters, but only small sets of characters are simple ones. A simple character is usually one simple and individual logogram, representing the basic elements or actions of human life. (Most of them mean common things like water, light, sun or moon, which are the core words in most languages.)

Simple characters can be borrowed or transformed into components—the accurate name is Chinese radicals—to build complicated ones, the Compound Characters. The main method for creating them is called Phono-semantic Compound, which use one radical to indicate meaning, while using another radical to present the sound. A person who knows the language well could easily distinguish the phonetic and semantic radical, therefore predict the sound and even the meaning of a random character.

手 → 扌 + 爪 = 抓
+ 厄 = 换
+ 高 = 搞
Chapter 2
Situation Analysis

This project is a Latin match-making type design project for Chinese Seal script style. This chapter will explain why seal script style is chosen, and what need to be done in the project.
2.1 Similarity and Difference between Chinese and Latin type styles

2.1.1 Serif, the Common feature between Latin and Chinese

As mentioned in Chapter 1, for text typefaces in Latin Alphabets, there are two main categories – Serif and Sans-serif; in text typefaces in Chinese characters - Hei, Song, Fangsong & Kai.

It is interesting that both writing systems has developed their “serif” in visual style independently. Song style has always been recognized as Chinese serif style due to its symbolic triangle decoration at stroke ends, and this definition is widely accepted. Even in the CSS (Cascading Style Sheets), Song style font is always given a “serif” value in generic-family property.† It might be a coincidence, but a coincidence that only happen to scripts that has a long history of printing. Let me explain why.

For serif of Latin, we always refer its origin to Imperial Roman style. In Edward Catich's book *the Origin of the Serif*, he reached a conclusion based on his study into Trajan's Inscription – the serif is not an invention for decoration from the stone engravers, but has its origin in brush writing. In a word, the serif was written originally, and inherited in movable and digital types. But somehow, the serifs in movables and digital typefaces still served a good function as leading people’s vision to move smoothly between letters.

† The definition of font-family property value in CSS, http://www.w3.org/wiki/CSS/Properties/font-family last modified on 16 June 2011, at 18:02.
Now let us turn to serif of Chinese. There are two main explanations of its origin. Some people think it as an inherit from soft brush writing. The triangle-shaped end represents the soft brush stop at stroke ends. As time passed by, type cutters simplified their visual language, the strokes became geometrically horizontal and vertical, and the irregular brush stop turned into a triangle-shaped serif. In the other hand, the serif is thought to be invented as a functional feature for the woodblock/movable types. As Chinese characters has lots of horizontal strokes, type cutters added these serifs into the end of thin strokes as reinforce to make them last longer. Personally speaking, the first explanation might be the major reason of the form of serif.

The Latin serif was a hand-written feature originally. Instead of being replaced by faster and simpler hand writing style, it was kept as an important visual element in typefaces. Chinese serif has its calligraphic origin, but formed in the woodblock/movable types. They are both results of printing industry. For any script that does not have a long history of printing, it is impossible for them to form a feature “serif” that is strongly connected to but also distinguished from hand writing styles.

Fig 2.3
Kozuka Mincho & Sabon

世界 Ngp
2.1.2 Sans-serif in Latin and Chinese

It is also indicated in Chapter 1.3.2, that Sans-serif style is also a common visual style in both Latin and Chinese. Hei style in Chinese is the name of the Japanese imported style Gothic. And the Gothic style in Japan is the localization of the sans-serif style.

Based on similar attitude on Song style (see Chapter 1.3.2), someone would argue that it is better to use the local name Hei for Chinese. Since Hei style has a traceable origin, it is also okay for me to call it Chinese sans-serif. It is interesting that Hei style is not only visually similar in the modulated strokes and neutral appearance, but even shares same technical design element – pronounced end. Along with inktrap, pronounced end with concaved top is a common method to avoid ink from spreading in printed letters. But in some typeface like Optima, this design feature also shows the simulation of nib pressure changing at the middle and ends of strokes, or indicates the serif of Roman letters.

Things are almost the same in Chinese. Pronounced ends were used a lot in old Hei style typefaces, especially in those designed for photosetting print. Of course some of the typefaces are digital revived as computer fonts, and the “unnecessary” pronounced ends are treated as the old flavor of 20th century.

Fig 2.4
Hanyi Zhonghei & Optima
2.1.3 Similar but Longer Design Process

It is always heard from the learner of Chinese as a foreign language, that they are drawing Chinese characters instead of writing them. It is true, ideographic writing system does seem to be complicated as graphs to the beginners, but if you are a designer who deals with types, you will soon realize the design logic is very similar with other languages.

Type designers often begin with simple letters/characters. For example, Latin typefaces usually begin with letter n & o, then the proportions and design characteristic of them would be applied to the other letters. More details will be discussed with this project in Chapter 4.

There is no difference in the design method between Chinese and other script. A common workflow of Chinese type projects begins with designing the strokes. Afterwards, simple characters would be constructed with those strokes. Therefore, the simple characters would be used as components to make the other characters. Follow the steps from simple to complex, use frequently-used characters or their parts to expand the character set... Nothing is new in Chinese type design.

Fig 2.5
The decomposed strokes of Chinese characters.
Fig 2.6
The 25 simple characters as the beginning template set, containing all basic strokes.

However, the characters set of Chinese is extremely big. According to the latest national standard GB18030-2005, it requires type foundries that follow the standard to include at least 27533 Chinese characters in their fonts. And this results in a very long design process. Even the latest type editor softwares (Chinese type foundries make their own in-house software) speed up the work flow, it still takes a group of people one year or more on a single typeface project from Zero.
2.1.4 Regional Variation in Chinese

No matter what languages using Latin letters, they are using the same alphabet and mostly same letterforms in a same style. (Though some European languages might use a lot of diacritics, the letterforms are still universal.)
Due to the wide-spread use of Chinese characters, people in different areas of Asia would use different characters to describe the same thing. As they have developed different standards on writing, they would surely pick different characters as their defaults. And the result is the current regional variation of Chinese characters.

A “same” character (do not let it mislead you, here “same” means they are just supposed to be the same. For example, though 櫻, 櫻 & 桜 are different, they are the same character representing the cherry blossom) might have different forms, and be assigned with different Unicode identifiers. Sometimes, they are not in different forms, but assigned with same Unicode numbers. This is a major problem in CJK typefaces, but it will not be discussed in details in this thesis.

Fig 2.7
Samples showing form variation of “same” characters in Simplified Chinese (Red), Traditional Chinese (Blue) & Japanese Kanji (Black).
2.2 Reason & Problem of Simulation Type Design for Chinese

2.2.1 Choosing Seal Script

Chinese and Latin script share a lot visual similarity, even though they are different writing systems.

It would make very minor or completely no contribution to both languages if serif of san-serif style is chosen for a simulation typeface projects, as they exist in both scripts already. But it would be a great challenge if a calligraphic style is chosen. So the next question is, which calligraphic style?

Regular script is not a good choice, as many people have worked on that already. Some people thought that regular script fits well with italic calligraphy. It worked very well sometimes, as Fig 2.8 shows.

That is the reason why some people argued that Regular script style should be defined as Chinese italic in CSS style, but that was another discussion that will not continue here.

Finally, Seal script was chosen as the style to work on. It was very archaic, which made it even unfamiliar for most of the Chinese people. This thesis could take advantage in it for exploring more in seek of basic principle of type design, as the design process have a clean start from the basis.

Fig 2.8
Specimen of Waran, winner typeface of Morisawa Competition 2014.
2.2.2 Low Design Quality of Seal Script Typefaces

Because of the reason mentioned in early chapters, the principle of designing Latin for seal script style has not been developed yet. Therefore, the type foundries in China made their attempts separately.

It was obvious that none of them were in high quality. Either they lacked visual harmony with the elegant Chinese part, or they were just a rough design work with limited thoughts. Even this is a very graphic style, sometimes limited to cheap usage like Chinese restaurants, but there are users who care and are not satisfied with the current typefaces in seal script style. Hopefully the simulation typeface project would provide them a better answer, or gives out another possible direction to inspire other type designers.

Fig 2.8 Seal script type specimen from Founder.

Fig 2.9 Seal script type specimen from Hanyi.
Chapter 3

Researches

Of course, before the project started, studies in various calligraphy works & type design projects have been done. Either the studied materials are good or not, this thesis is benefited from the precious experience of those calligraphers & designers.
Bronze inscription is the origin of seal script. It is usually carved in on the bronze containers, not written. Based on the picture, it is obvious how it influenced seal script directly on its visual appearance. However, it is not standardized like seal script, so it could only be taken as a visual inspiration.
3.2 “Bad” or “Not Good Enough” Simulation Typefaces

It is hard to define the adjective “Bad”. Here, it is used to describe the design concept that is not agreed in this thesis.

Songti Yinwen from MakeFont (造字工房宋体英文）

This typeface is a Latin typeface borrowing the visual elements directly from Chinese Song style. It is visually similar to Chinese characters, but as a Latin typeface, it has an extremely low legibility. In the alphabet, it is hard to tell the 4th letter is capital D. Besides, if you are a Chinese reader, it is very easy for you to mis-recognize some of the letters into Chinese, like the capital Z which uses the same shape as character “乙”. For the visual similarity in strokes, designer cared too less on legibility and sacrificed the very basic function of showing letter form correctly, and that is the reason it was taken as a very bad sample of simulation typeface.

Fig 3.2 & 3.3
Songti Yinwen designed by MakeFont, showing the upper-case alphabet and the sentence “THE SUPREME HAPPINESS OF LIFE IS THE CONVICTION THAT WE ARE LOVED.”
Title Typeface from *The Little Book of Hindu Deities*

Neither the name of this typeface nor the designer were known for now. It simply adds a horizontal bar on top of the Capital letters to make it looks like Devanagari. Somehow it achieved editor’s purpose, but it does not explore deeper connection between Latin & Devanagari script, and lacks in consideration on the visual details.

**TBFZ (Typebank & Founder) Tekkin Reisho (方正铁筋隶书)**

Instead of “bad”, This sample could be described as “not good enough”. Tekkin Reisho is a typeface in Clerical script. The Latin part successfully gained the stroke form from Chinese characters. As individual letters, the design is not that bad. However, if the typeface was put into text layout, the proportion and consistency are not good enough.
3.3 Good Simulation Typefaces

In opposite of “Bad”, these typeface projects are “good” in concept and quality.

The concept of applying fundamental graphic design principles to different script is preferred, as it helps to get a high consistence without losing legibility in multiple languages. Also, The inspiration from the good solutions that the designer reached is highly appreciated in this thesis.

Kohinoor Devanagari by Peter Bilak & Satya Rajpurohit

This project is involved with Latin & Devanagari. Though the two writing systems are greatly different, the designers succeed in getting a visual consistency between them. Similar to Latin, Devanagari part also need to find a visual balance between solid strokes and negative spaces.
Qundas by Laura Meseguer, Kristyan Sarkis & Juan Luis Blanco

Qundas is a pretty new typographic matchmaking project, and the design team presented it at the yearly conference of ATypI (Alliance Typographique Internationale) 2016, under the theme of convergence, in Warsaw, Poland. The type family would include script in Latin, Arabic & Tifinagh. As Arabic has two different writing styles, fluid and solid, the Qundas team decide not to only design 3 weight, but also 3 styles – Fluid, Solid and the style in between.

Fig 3.8

As a result, Latin & Tifinagh designers would need to search for ways to make the script to look fluid or solid. This is especially hard for Tifinagh, because it was in geometric hard forms originally. Somehow, they imported the concept of different writing tools and materials into their design, and solve the problem excellently. They took inspiration from stone carving to build the solid letters, and write on the soft sands to simulate the fluid shapes. This is brilliant, and Qundas type family turns out to be fantastic.

Fig 3.9
Slides of Tifinagh designs based on different writing tools and materials. Photographed in AtypI 2016, Warsaw.
Fig 3.10, 3.11 & 3.12
Type specimen of Qundas.
There are several ways of starting a type project. Some designers prefer to use computer from beginning to the end, like Fujida Shigenobu (藤田重信) from Fontworks.

It does help to draw your letters quickly if you draw them on paper before hands, but it also takes time for you to do the works with hands. Well, you do not know which way is more efficient.

He said so, and he might be right. For current designers, computers and design applications are their daily tools just like pencils. Besides, these tools are becoming more and more handy, maybe someday they would really be used as easy as pencils.

However, type design is only a simple issue of efficiency. For type designers who are taught to practice hand-writing when design types, writing letter with pen or pencils as a design process is not only because they cannot get rid of the old tools and habits.

Languages and writing systems are 100% man-made. Writing reminds the designer the flow of human hands as origins of letters, helps them memorize letterforms both visually and physically, with their eyes and hands. As a result, it is natural to begin this project with writing Chinese and Latin.
4.1 Seal Script Hand Writing

Though the author is a native Chinese speaker and writer, what is taught in school is modern simplified Chinese. The letter forms are in simplified Chinese (see Chapter 2.1.4) are standardized by Chinese government, and hand-writing are educated from regular script samples. But there is a gap between regular script and seal script, no matter in stroke form or structure.

Basically, writing of Chinese characters' strokes follows the rule of “left to right, above to below”. The strokes could be categorized into horizontal bars, vertical bars, out-strokes, turning strokes, hooks and dots. People often use the character “永” to summarize these features.

In the writing of seal script, a lot of strokes are different. Usually it is just a problem of visual translation. If you know the translation principles between seal script strokes and regular script strokes, you can easily make it with the same writing order. A translation chart would be included in Appendixes.
The only exception might be the closed round shape in seal script, which could be seen in the traditional Chinese character “樂”.

Note the circle shape in the top part. You could write it in two strokes, using one left down stroke and one right turning stroke to form a closing counter. And that is the traditional way to do it, at least before Qing Dynasty. People always want to write the characters faster, which seems to be an universal demand on hand writing. As a result, a lot of calligraphers in Qing Dynasty prefer to write it in one circled stroke. Either way, the different writing order would not affect too much for this project, as the visual form is pretty much the same.

Fig 4.3
The traditional Chinese character “樂” in seal script and diagram of writing circled shape in different writing orders. Left diagram is the early way, and the right one is the later way (in Qing Dynasty)
4.2 Latin Script writing

It is certainly necessary to practice Latin script hand writing for a Latin type design project. In fact, one cannot take the type design class in RIT if you have not finished your calligraphy class.

In this project, the author mainly practiced Italic (Chancery) hands to help the design of lower-case letters, while using Imperial Roman as reference for the capitals. Details will be explained at next chapter.
Chapter 5
Design of the Latin Alphabet

After all these preparations, the type design process will be explained in this chapter.
5.1 Early Attempts on Lower-case Letters

Ideally, all the researches and calligraphy practice are supposed to be finished before starting to draw letters, as a professional design work. But in fact, that this thesis begins with sketches right after the early idea of the thesis proposal. There is no doubt that these sketches would end up as failure.

Fig 5.1
The very first sketches of lower-case letters

This picture shows the earliest drawing. It is easy to find that no design concept has been form to control the shape, all the letters has many variants in chaos. Without practice and understanding of seal script and Latin calligraphy, it is very difficult to make them visually consistent. After practicing with seal script, second attempt was made as below.

Fig 5.1 & 5.3
The very first sketches of lower-case letters

The practice works. You can see some visual elements of seal script – like out swash – have been applied to the sketches. But it is still too far from a consistent design.
5.2 Prototyping Lower-case Letters

The direction is clear that seal script characteristic should be applied to the typeface. So the experiment follows a simple method – keep writing in both script, especially seal script, until I found a way to make them in harmony.

During that time, it was always attempted to write the full alphabet in one time, but this turns to be a bad decision. The alphabetical order is what people use to learn the language, but not the visual form of letters. It is hard to see the connection between them, nor to summarize the shared shapes of letters. The scrapped sketches proved that start with alphabetical order is not a good idea, at least to a type design beginner.

A frequently recommend lower-case letter string to begin with is “hamburgerovns”. The reason for using “hamburgerovns” is that it contains many visual elements you can re-use in other letters. The letter “n” and “m” give you the stem widths and the space between them; the letter o gives you the closing counter which would appear again and again in your design; and the letter v tells you the proportion of letters with slanted strokes, etc. If this string was designed carefully, you would have a good start for a type design project.

As this project need to fit with another existing typeface, Founder Small Seal Script (方正小篆) was chosen at first. Later, the matchmaking typeface was switched to Hanyi Small Seal Script (汉仪小篆). The letterforms of these two typefaces are basically the same, because they are digital revival of a same set of movable types. The reasons of switching are listed below.

- Hanyi Small Seal Script has a bold version (汉仪粗篆). Though they are not currently built into one type family, like STHeiti & STXihei in macOS, they could give a family option in the future.
• Hanyi Small Seal Script has a larger UPM (Unit Per Em) 1000. Usually UPM would affect the type quality too much if it is over 1000, but Founder Small Seal Script has an extremely small UPM 256, which resulting a poor quality of outline.

• the author currently (from 2014 till now) works for Hanyi, and it is easier to get a license to modify the Chinese font.

Fig 5.6
First prototyping of “hamburgevons”

Here is the first prototype of “hamburgevons”

Though it is still not a very pleasing result, even the x-height is messed up, it has absorbed some key feature from the reference typeface. Let us highlight the character “目” (4th character in the Chinese phrase) and “向” (6th character in the Chinese phrase), and they are the origin of the closed and open shape in this project. This idea of defining open and closed shape is the understructure of next breakthrough point.
5.3 Grid System and Confirmed Lower-case Prototype

Chinese characters are often called “the block characters”, because they are usually set in a square. If you set a CJK grid parameter in a font editor, you would get a full-width em square in default. But it does not mean they are aligned with the edge of the square. Instead, they are aligned with an abstract visual center. However, they are supposed to cover a consistent percentage of the em square, which is called the virtual body.

As you can see in Fig 5.7, the alignment is a little bit ambiguous comparing with Latin script. In Latin script, letter has several clear alignment line – baseline, meanline (x-height) and cap-height. Chinese characters look like a set of capital letters, but not precisely aligned to a reference line. Characters with a closed shape like “目” tend to be smaller, while the open shaped ones like “大” would be a little bigger in geometric dimensions. They cannot reach a visual consistency in small ponit sizes unless being designed like this. We could describe the difference in metrics as an ambiguous overshoot in Chinese.

The multi-language alignment will be further discussed in Chapter 8.
In small seal script, the variation of dimensions are even bigger than other styles. Is there any way to apply this specialty in Latin design? The answer is yes. Usually the lower-case letter are aligned with both baseline and meanline, while the round letters have overshoot over these lines a little bit. But if we divide these letter into open and closed shape groups, the Chinese alignment principles could be applied to them.

For example, for the two starting letters “n” and “o”, “n” is the open shaped while “o” is closed. Based on the Chinese alignment rule, “n” should be a little bigger in the open part, so the foots of “n” are made to descend a bit below the baseline. However, it is not common design in Latin, the classic aligning method are still taken into consideration. Taking some inspiration from Hebrew and Devanagari, and the letters are decided to be aligned by their shoulder.

It is necessary to explain why “n” & “o” are chosen out of the “hamburgeson” string at the start point. Even “hamburgeson” is the basic starting string, “n” & “o” are the most fundamental part. “n” is the representing letter with straight lines, and “o” is the simplest letter with curves. In Latin type design, not only designing the letters themselves, but also the space between them is important. For these two letters, their side bearing tells us how the space between straight and curved lines should be.
Well, different type designer has different preferred start point. Like the snapshot below, Matthew Carter like to begin with “hop” string, which also indicates the ascender and descender. Anyway, as we tried to make everything simple and clear, the two-letter word “no” is what we begin with.

Based on this principle, it was easy to make the grid system and first set of sketches. (See next page.)

Human’s eyes are not rulers, and they often lie to their owners. The vertical lines tend to be thinner than horizontal lines if they are given the same width. For a typeface, the horizontal lines should be geometrically thinner than vertical ones, in order to gain a visual evenness. Do not forget this important tip.

Also, most of the strokes have pronounced round ends. This element is a simulation of brush writing, as the soft brush pen stops at the beginning and the end. But the emphasis is carefully handled, so the stroke ends will not turn to be dark dots in small sizes.
Fig 5.11
First confirmed sketches of lower-case letters.
5.4 Digitization & Modification of Lower-case Letters

The sketches need to be scanned and digitized into vector outlines. Before the scanned data got imported into font editors – no matter FontLab or Glyphs – it required to input a name for it. Maybe this is the only free part that a type designer can do without any limitation. This simulation typeface is named Akchessima. And from now on, Akchessima will be used to refer this project.

5.4.1 Focus on Legibility

Before starting the explanation on details, it will be good to have some additional information on legibility.

Legibility could be briefly defined as distinguishment between letters.

Among a lot of researches done on legibility, here is a interesting picture about it. In this picture, the researcher blurred a majority part of the letters in Arial, but reader could still tell the letters correctly. That was because the letters have the key part for people to recognize them, and those parts were not blurred. For example, one will need the cross bar to tell it is letter e, and the closed curve on the right to distinguish letter o from letter c.

This might be the key concept of Akchessima. Akchessima is not just a game of visual matching, legibility is a very important issue in a type design project. However, based on the foreign style, the most legible form of Latin letters is not the top priority. It is only required to find the key part in letter forms and let people recognize the designs with an alien appearance.
Instead of explaining design details letter by letter, the finished alphabet will be shown first. And then they will be specified into groups for explanation.

To make it brief and clear, two samples of lower-case letters’ design are chosen as project milestones. Spotlights of these two versions will be explained in the following parts.
5.4.2 Design of Letters with Straight Lines

Fig 5.13 shows the letters with straight lines in forms, and they are n, m, h and u. Precisely speaking, the lines are no longer straight but curve inside. The connection between two legs of n is not a smooth arc, but a emphasized turning point. This is simulating the brush flow of writing a turning stroke in Chinese.

Letter h is basically an n with extended ascender. But letter u is not an upside-down n. Its bottom curve aligns with base line, only the tail go beneath the baseline with equal length as n.

Letter m has been slightly modified with the upper curves in 2nd version, but the general image remains the same. it is approximately a symmetric shape, with the same beginning part as letter n. After some back and forth experiments, center stem of m was decided to be short. It would help to distinguish it from n, and make it more legible in the running text.

5.4.3 Design of Letters with Curves

This group of letter begins with o.

Letter o was never a perfect circle, but it is usually centrosymmetric in text types. But in Akchessima, letter o is axis-symmetric to form a similar closing shape in seal script. Based on same reason, we extended the out stroke of c and e to gain the seal script flavor.
Later, the “straight” lines were borrowed from finished letter n and h, then the letter b, p, d and q were built.

\[ abpdq \]

Letter a and g have the variants of single storey and double storey form, and the double storey form was chosen. There are two reasons for the decision. As the tail of a will get below the baseline, it might cause a legibility problem between a and q. Another reason is about the future expansion of character set. Though it is just a display typeface with the ASCII standard character set, there is no guarantee that it is completely unnecessary to make the IPA (International Phonetic Alphabet) extension. And the single storey a and g are needed for IPA. With further consideration like this, it is a safer choice to keep a and g in ASCII part in double storey form.

Letter s has been changed a lot between the two versions. The key characteristic of letter s is the soft curves. But the turning in the first version was too hard, making it less legible than expected. It is a typical result when you sacrifice too much for visual similarity in a simulation typeface.

\[ S \]

IPA would also borrow the ASCII part, single and double storey a represent different sounds, so it is a must to make a visual difference between them.
5.4.4 Design of Letters with Angled Strokes

Letters v, w, x and z belong to this group. Like the word “straight” in chapter 5.3.3, “angled” might not be that accurate, either. In the final visualized result, most of the angled strokes turned to be curved. A straight angled line must be very legible, but it will also lack the visual factors to match seal script.

Letter v and w are softened, along with x. Of course, feet of x have been extended.

Unlike letter s stands out for its softness, Letter z is distinguished for its hard turnings. If not, it might look like a numeral 2. Though the center strokes are still curved, it was designed to hit with the two horizontal bars directly.
5.4.5 Modification for Legibility

You may find that not all the letters are covered in previous parts, some of them are refined a lot for better legibility, like letter g mentioned in chapter 5.3.3. These letters’ design will be explained separately here.

· Letter i & j

These are the letters with dots.

Dots in heavy weight could be designed with the same width as the stems, but not in light weight. In small sizes, dots looked smaller than a stem stroke in equal width, or sometimes it is hard for people to see. As shown in Fig 5.22, the dots were designed to be wider than the stems, and also carefully treated to keep the seal script flavor. Just like the letter o, dots are not perfect balls, either. They were simulating a hand-written dot, which stopped at the top, and left the paper gently from the bottom.

· Letter k

Letter k was originally a letter borrowing components from letter h, but it ended up as a form that no one knows what it is. In this situation, Helvetica and Univers were taken as reference. No matter the right part are one strokes or divided into two strokes, they are connecting somewhere in the middle. As the soft out stroke is a good feature to keep in this design, the upper stroke is dragged down to connect with it. This connection works well, even it is not a common k people used to see, most of them think it is still legible.
Fig 5.24
Letter r modification. Red glyph is the early version.

· Letter r

Original sketch of letter r looked like a misplaced German long s. Though some seal script flavor were added into it, the weird shape just turned to be disruption on letter form. Finally, it was decided to make it in the regular way, and here is the drawing.

Fig 5.25
Letter g modification. Red glyph is the early version. Also compared with Optima and Gill Sans.

· Letter g

Somehow, design of a was confirmed in first version, but g was not. The loop of g is not connected. This design choice will make it more like seal script, and it also appears a lot in other typefaces. But there was a problem with the direction of the ear of g. Based on feedback from the type design class, the left pointing ear seemed to be very weird to the native readers of Latin script. When it was change to the right, even the letter is still an irregular shape, people responded they have no problem with legibility as it has the unique descender in text.
Fig 5.26
Lower-case Text sample with a unique but even visual pattern, set in 48 pt, with Hanyi Seal Script typeface as reference.

Fig 5.27
Text Sample in 14 pt, with Hanyi Seal Script typeface as reference.

a wise man will know what game to play today and play it. We must not be governed by rigid rules as by the almanac but let the season rule us. The moods and thoughts of man are revolving just as steadily and incessantly as nature's nothing must be postponed take time by the forelock now or never. You must live in the present launch yourself on every wave. Find your eternity in each moment.

After the refinement, the second digitization are pretty much the final decision of lower-case letters. They are attached with seal script visual features, some of them are not even in the normal shapes. But they have an inner consistency, and also visually pleasing when they are set in text.
5.5 Preparation for Upper-case Letters

After finishing the lower-case alphabet, the process became much faster than before. Lower-case design process expressed the way they were composed well, it is much easier to build the capital letters based on their skeletons. In this step, all capital skeletons were drawn in whole at beginning. Due to the lack of proficiency, the first sketch was consistent with the design of lower-case alphabet, but not in same quality as the small letters.

![Sketches of Capital Letters](image)

The main problem was the proportion of the letters. In order to solve these problems, several resources have been studied. John Howard Benson’s *The Elements of Lettering* is the very book to learn about skeletons.

![Linear Skeletons and Corrected Skeletons](image)
The linear skeletons showed the archetype model of capital letters, and the corrected ones are modified model for visual comfort. In a word, the corrected skeletons are a good sample to follow with.

In Edward Catich’s book *The Origin of the Serifs*, he took Trajan Inscription as a classic sample of Roman capitals. There is a picture in David Harris’ book *The Art of Calligraphy* shown below, which categorized the upper-case letters by their widths. It is a very good visual explanation on the proportions of classic (Imperial Roman) capital letters.

![Diagram of Roman Capital width](image)

Fig 5.30
David Harris’ diagram with Roman Capital width.
By the time the letters were drawn, these two books are the main reference. However, it is always good to see more good samples. A recent (2015) published book *The Eternal Letter: Two Millennia of the Classical Roman Capital* was a great source. It gathered some essays on Roman capitals, along with many high-quality pictures.
5.6 Design of Upper-case Letters

With this research, it was not hard to process smoothly. Soon after, the capital alphabet sketches were finished. (Actually also with the numerals and punctuation design, but we will discuss about them in the next chapter.) The digitization was also done quickly with the sketches.
Before everything, the basic understanding of upper-case letters is needed. In early stage of Latin script, there was only capitals. When people invented the minuscule later, they used the capital form at the beginning of text as initials. In a visual designer’ view, the capital initial was an indicator of the beginning of a sentence or a paragraph. To make it visually work, this element should be emphasized. That was the reason that upper-case letters were designed a bit thicker than lower-case ones. If you need a ratio, capital letters are about 10% thicker than lower-case letters.

It was a much easier job comparing with the lower-case letters. So, in the explanation on the capital designs, only several groups of letters were chosen to show more details and refinements than others.

· Letter H, N and M

This group is the “straight” line group. Just like lower-case letters in Akchessima, most of the strokes are still curved. Since strokes in seal script style are even widths, we did not need to consider too much about the width contrast in H, N & M. (It is interesting that Chinese type designer often made “mistakes” on this, and here is an example.)

To get an even space between the strokes became the main topic of designing this group. You can see that the current letter widths are set basing on the classic proportion of Trajan – Letter N is a bit wider than letter H, while M is the widest. If M is in the “normal” form constructed by 4 straight strokes, we usually need to either modify the angle of the strokes or raise the center bottom to get a visual balance among the three negative spaces. (Sometimes, we do both methods.)
However, the current M is an irregular form. It was inspired by seal script writing, and it looked like an upside-down character “山”. The two center strokes are joined on the upper part, and extended to the baseline. The final decision of the three letters are shown below.

- Letter B & D, letter R & K

Though Akchessima was a narrow typeface in general, most of the forms followed the Trajan proportion. These groups are proofs for this principle.
· Letter R, K, W & M

These groups are usually grouped into the letters with slanted straight strokes. Besides, K & W are also those who share similar forms in both upper & lower case. Fig 5.39 shows how they are designed.

The form of angled out stroke in capital K is borrowed from same part of lower-case k. As R was supposed to have a similar stroke in Imperial Roman, it uses the unique component, too.

As a letter, W was originally developed from double V, both lower and upper case represented its origin. The main difference is that lower-cased w used connected v form, while the upper-cased W used two V with crossed arms, or the capital would be too wide.

M was listed here again for it is usually visual similar to an inverted W, but they are different for they were not developed from the same origin.

· Letter E & L

Left and bottom part of E and L were separated in two strokes, and this was inspired by writing of the italic swash capitals. By doing so, the letter forms avoided losing the flavor of Latin hand-writing even the whole typeface was manipulating seal script style.
Letter P

Letter P was picked up individually as it was also considered to have similar forms in upper and lower cases. In fact, the bowl of p and P were slightly different, as shown in Fig 5.41.
Chapter 6
Numeral, Punctuation, Symbols & Legibility Issues
6.1 Numerals

Fig 6.1
Numeral sets in Adobe Clean, with various purposes of use.

HALOGEN 0123456789 CAP (TAB)
Halogen 0123456789 Universal
HALOGEN 0123456789 SMALL CAP
halogen 0123456789 oldstyle
halogen 0123456789 O.S. tabular

A typeface might either have lining or old-style figures for numerals, and some of them might have more style options than you expected. But the designer has to choose one default set for users in the most frequent design applications, and there is no exception for Akchessima. In this case, tabular lining figures were chosen for default, in order to fit with the equal-height Chinese characters.
6.1.1 Design of Letters with Angled Strokes

Even designing the lining figures, old style figures resource would also help you to build a better form. For example, some old-style numerals designed by Eric Gill all showed 2 with irregular height. But I thought this was a smart idea. Usually old-style 2 has the same height as 0 and 1, which is pretty short. Eric raised the height a little bit, but not as high as 3. As 2 and 3 had very similar curved top part, the difference in height could add distinction with short numeral like 0, but without misleading people to recognize it as a 3.

With the inspiration from Eric Gill, even the numerals in Akchessima were lining figures, the closed and open bottom letters vary in form. Open bottom numerals 3, 4, 5, 7 & 9 would extend over the baseline, while closed numerals 1, 0, 2, 6 and 8 still aligned with baseline. 1 was included as closed bottom letter because it chose a form with foot.
6.1.2 Counter Shape of Numerals

The closing counters in Akchessima were not pure circles. Instead, they are flat on top, and rounded at the bottom. Repeating this shape was one of the keys of keeping consistency in Akchessima. So, here you see the design of 6, 8 & 9, and how the counter form was adjusted.

Fig 6.4
Numerals 6, 8 & 9 in Akchessima
6.2 Punctuations and Symbols

Akchessima’s character set covers ASCII Standard. In this section, some representative glyphs are selected to explain the design concept.

6.2.1 @ sign

The sign @ has a history over 500 years, longer than some people expected. However, the origin of @ and its function was not the main topic, this thesis will focus on the modern usage on this sign. Nowadays, a common use of @ is to be a separator in email addresses, separating the user ID and the server domain. (E.g. John@gmail.com, John is the user ID and gmail.com is the domain.)

In order to be a “good” separator, the inner part of @, which looks like a single storey a, was often designed to be slanted. The angled part would interrupt the rhythm of roman letters slightly, and separated the two parts aside the sign.

However, the goal of Akchessima is not a text type, but apply the seal script style to Latin script. Visual harmony was put in higher priority. At the end, the center part was not angled. But the outer circle stopped at the middle of the bottom, which made the skeleton like a soft brush stroke in seal script.

Fig 6.5
@ sign in Akchessima, comparing with Univers.
6.2.2 Ampersand

Ampersand was originally a ligature of the letters et, which means “and” in Latin. As seal script was a very archaic writing style, I preferred to pick an original form for it. This became the main reason I designed the ampersand like a ligature of cursive E and t. Of course, in order to keep the visual consistency, cursive E borrowed the shape from numeral 3.

Fig 6.6
Ampersand and numeral 3 in Akchessima

6.2.3 Pound, Percentage & Other Signs

Most of time, the mathematic symbols are designed in a neutral form, for it has stricter visual rules on their usage. (E.g. a mathematic constant should be set in italic style, while the superscript numerals are supposed to be in roman style.) However, in project Akchessima, the most important issue is not the scientific accuracy. Instead of a neutral form, harmonizing with seal script spirit is a prior task. The guideline resulted in the curve and graphic form of the final design of the scientific symbols & punctuations.

Fig 6.7
Symbols & punctuations. Numerals 0, 2 and letter I were also put here to show the consistency.
6.3 Legibility Adjustment

As Akchessima covers the full character set of ascii standard, it requires to explain some more details in considering with legibility.

-Numeral 1, Lower-case l and Capital I

These three sticks are easy to misread, even some famous typefaces have the trouble. In Erik Spiekermann’s blog post *Helvetica Sucks*, he used this graph to show that Helvetica’s letter forms are not legible enough in small sizes.

![Comparison between Helvetica, Arial, FF Meta & FF Unit, from Erik Spiekermann’s blog.](http://spiekermann.com/en/helvetica-sucks)

![Fig 6.8](http://spiekermann.com/en/helvetica-sucks)

But there are many methods to distinguish these glyphs. If you want 1 to stand out and could be recognized by itself, you could add a foot to it, like most of the text type did.

![Fig 6.9](http://spiekermann.com/en/helvetica-sucks)

Numeral 1 and its early version in Akchessima (in red), comparing with Optima & Minion.
To tell the difference between I and l was hard in a lot of typefaces. Of course, you could add a little tail at the bottom of l, or add serif to I to identify them, but both the tail and serif were too much for seal script style.

In typefaces like Optima, designers did not use characteristic part to identify the letters, but only uses the difference in widths and height to distinguish them when they are together. In Akchessima, both ascender and cap-height were the same, in order to avoid too much variation when set with Chinese text. The difference in width was not obvious, either.

In Akchessima’s case, a top to the lower-case l was added, while the form of capital I was kept as a simple vertical bar.

- **Numeral 2 & Capital Z**

People need the round top of 2 and the zigzag turning on top of Z to recognize them, and this is also the key point to design these two letters.
Numeral 0, Lower-case o & Capital O

This seemed to a never-ending problem for type designers, especially for 0 and O. In some extreme situation with specific requirement, like monospaced font for coding, designer would use slashed zero or dotted zero form. But in many cases, what could be done is only to add some difference in width, and so is Akhessima.
6.4 Making Ligatures

In chapter 6.2.2, the phrase “ligature” was used. What is a ligature and why do designers need to make them? These questions will be answered in this chapter.

A ligature is a single glyph joined by multiple glyphs. Some of the ligatures were created for visual purpose, like a common fi or fl ligature. As the terminal (top end) of lower-case f would connect to the dot of i or the top of l in an unpleasing way, the two letters are combined into one glyph. In Akchessima, same problem occurs. The cross stroke of f would connect with the letter next to it if followed by i or l, so fi and fl ligatures are designed in Akchessima, too.

As a font is not just a set of glyphs, how do type designers make the ligature works in the computer design applications? Currently, it mostly relies on the OpenType feature to do this. You need to create a mapping from f and i to the fi ligature, and tell the software when to trigger the mapping. You need to write some “script” to let the fi ligature replace the original letters when f and i are set together.

In this thesis project, font editor has been switched from FontLab to Glyphs, and the process became much easier. As Glyphs has a database for the characters in many writing systems, if you define the glyph name properly, the software would automatically recognize the relationship between glyphs and their ligatures or other alternative forms.
So, making ligatures is simple now. What is needed to be done is to name letter f as “f” and letter i as “i”, then name the fi ligature I made as “f_i”, which connects the two glyph names with an underscore. By doing this, Glyphs recognizes this is the ligature of f and i, then generates this under OpenType liga table.

```
sub f i by f_i;
```

This line of script means, the fi ligature would substitute the neighboring f and i when you triggered the ligature feature in text layout applications like Adobe InDesign.

In Akchessima, like f & i, r is also easy to join other letters with serif in meanline. The ri ligature was made originally, and it could also be achieved by similar methods as described above. If it worked, it should be categorized to rlig table, which means the required ligature that the designers insist on his or her own demand. However, the form of ri ligature was not very legible and got scrapped from final design.

Fig 6.13
Unused ri ligature.
Chapter 7
Mixed Text Layout in Latin & Chinese

In a thesis about multi-language typography, it is good to spend a few more minutes to discuss something about multi-language text layout. In a word, a typeface is the tool to form a text. It is supposed to show itself in the form of text.
7.1 A Typographic Detail: the $\frac{1}{4}$ em-width visual space between Latin and Chinese

It has been mentioned that, every character in the ideographic system is actually a word with meaning. Also, unlike agglutinative language, e.g. Japanese language, Chinese does not have clear grammatical particles (such as kana は or が) as markers of topic or something.

This results a big difference between ideographic and alphabetical text – Chinese does not have word spacing, nor an obvious visual difference for various elements in the text (like kana and kanji in Japanese).

In multi-language text, especially those in Chinese mainly, it is quite often to see some sentences or phrases in Latin inserted into Chinese. Without any doubt, they have word spacing themselves, but the Chinese text surround it does not have. This will make the visual break weird, because there is nothing to notify the switching of writing system, and the sentence would be broken mostly in the Latin part. To ensure a smooth transition between two scripts, a visual space of $\frac{1}{4}$ full width are usually inserted between Chinese and non-Chinese characters.

Fig 7.1
Samples of text with or without $\frac{1}{4}$ em-width visual space between Chinese and Latin script.


$\frac{1}{4}$ is a common value, but you can also customized yours. In Akchessima, the reference typeface has a pretty big letter spacing in Chinese part. As a result, a big visual space is definitely necessary for it. However, the visual space are supposed to be added visually by the typo engine, not added in plain text. We do not need do anything with the font, but remember to use CJK Paragraph Composer in your text layout software.#

Fig 7.2
Sample of text in Akchessima with $\frac{1}{4}$ em-width visual space inserted correctly.

啊，那是一款由 Blizzard Entertainment 开发的游戏。
7.2 Proportion of Typeface with both Chinese and Latin

Chinese characters are usually in full width. The virtual body (percentage of the glyph in a full em-square, see Chapter 5.2) determines the letter space between the Chinese characters. As they are visually complicated, characters with different structure should be adjusted to gain a consistent virtual body.

By the way, even Chinese characters in text are center aligned, the alignment is not that unequivocal. Do not forget to adjust the visual center when you design a Chinese typeface.

Fig 7.3
Samples of Chinese typefaces with smaller (up) and bigger (down) virtual bodies.

Fig.7.4
Some common structures of Chinese characters.

Fig.7.5
Diagram of adjusting the visual center of the typeface Hanyi Qihei.
Now focus back on a matchmaking project like Akchessima. The key question is, how the proportion of Latin letters should be when they are set with Chinese.

If a font has Chinese part already, combination of 国 and letter E are often used to decide the size of Latin letters. 国 is a typical character with closed shape, and E is one of the letters who has both horizontal strokes in both top and bottom. Though capital E is not the most frequently used letter in text, it is still often used to define the Cap-height. At the bottom of 国, it usually has two feet. Just ignore them when you use the character for size and alignment decision, only take the square part. Letter E are aligned to the point just below the visual center of 国 a little bit, and also a bit shorter in height. A common value of its height is 90-92% of 国 in text type.

The goal is not only a similarity in letter form, but also visual evenness in running text. Usually text in Latin are in mixed-case, in order to match the equal-height Chinese text, it is better to choose a letter form with big x-height.

In Latin typefaces, different weights often share same vertical metrics. It means, the Bold weight has the same x-height, Cap-height, ascender and descender with Light weight. But fat Chinese typeface would be slightly bigger than the light weight in all directions. So, the Latin part in a Chinese type family might not share same vertical metrics, even the baseline.
Based on these principles, Fig 7.8 simulates how Akchessima should look like when it was set with Chinese part. Both proper proportions and visually similar elements are needed for a match making projects.

Finally, the completed specimen of Akchessima is shown below. If you have interest in other match-making Chinese type project, please check them in the Appendix.
Chapter 8
Design Application

In some way, type designer shall stand neutral and gives no restriction on how graphic designers uses the typefaces they create. But in the other hand, a professional designer takes responsibility on giving proper advices for users of their products.

The type designer is the one who knows his/her typeface best, and is supposed to give samples of design applications with the fonts he/she produced. Speaking of Akchessima, it could be used in a situation related with traditional Chinese culture, or simply used in fantasy games with its foreign appearance. However, these are just limited possibilities. More potential lies in the hands of the typographers.
kweichow moutai

since 1915
Fig 8.1
Brand Re-design of the Chinese alcohol Kweichow Moutai.
Sun rising, sun setting; I just wonder what there is in the edge of world.

All the small pieces of the vast world come together...
Fig 8.2
Using Akchessima in my illustration story book *Voyage*.

Fig 8.3
Using Akchessima in the sketch of Shinobu game interface. Thanks for Liu Zhe providing his source material.

Fig 8.4
Using Akchessima in the internet meme "Confucius said".
Chapter 9
Conclusions

Back to the statement question of this thesis, is there a principle of designing the Latin letters’ shapes for this calligraphic Chinese typeface? If it means one universal principle, the answer might be NO.

There is not a universal principle that will always work for all style, nor should there be. But there are many resources that could help you to achieve your design goal. It might be the graphic design research or theory, it might also be the study of linguistics, or it might only be some “Common Sense” from years’ experience of using a language. If you still have no clue or doubt if the information you hold is right, do not forget that type designer is also a visual designer. Sometimes, you should trust your “Visual Instinct”.

Akchessima is a very specific case focusing only on the “calligraphic style”, the design methods used in Akchessima might not work well in other cases. But it successfully shows importance is to work with respect towards the writing tradition, the language, and the culture.

In some way, there are no good or bad typefaces, there are only proper or improper typefaces under certain situations. But as a type designer, he/she is supposed to give advice on the usage of their works, but not limit the use of their designs. Do one’s best in designing, and let the users show the most incredible possibility of the typefaces.
Bibliography


Appendix 1:
Visual Translation between Regular & Seal Script

This chapter contains an important part in the early stage of Akchessima's design process – how to get familiar with Seal script style.

As mentioned in previous chapters, like most of native users of Chinese characters, the author uses Regular script instead of Seal script. For same reasons, majority of Chinese calligraphy tutorials begins with regular script. In order to use the visual language of seal script, it is necessary to learn the conversion from Regular to Seal script.

At first this thesis tried to summarize the translation principles from the book Explanation on Chinese Characters and Origins of the Basic Chinese Characters' Forms and Meanings. However, without help from a linguistic, too much uncertainty appeared as it processed. Besides, Explanation on Chinese Characters is actually a dictionary providing only one glyph sample for every character. For an old writing style like seal script, it would be better to have more variants.

Thanks for some projects in Hanyi Fonts and the latest published book *Four Written Variants of the Seal Script Radicals from Explanation on Chinese Characters*, this project got a big “database” of the translation between these two styles. This book contains regular script style characters marked in red and four seal script variants written by four calligraphers, displaying the conversion nicely.

It is a pleasure to include the contents from the book in the last part of the thesis. Hope it would help the people who are also interested in Seal script.
Appendix 2:
Other Reference projects
by Author
Hanyi Wenhei Family

Pictograms
Simple Ideograms
Compound Ideographs
Rebus / Phonetic Loan
Phono-semantic Compound
Derivative Cognates
東国三力今書鷹键愛袋永晴杂娱逊虞树流酬闷随转
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyzæœåáàäèéëêèøöòðúùû
ABCDEFGHIJKLMNOPQRSTUVWXYZ
αβγδεζηθικλμνξοπρστυφχψω
ΑΒΓΔΕΖΗΘΙΚΛΜΝΞ
ΟΠΡΣΤΥΦΧΨΩ
абвгдежзийклмнопрстуфхцчшщъыьэюя
абвгджжзийклмнопрстуфхцчшщъыьэюя
Hanyi Wenhei Family
Appendix 3:  
Original Thesis Proposal

Latin Type Design for  
Digital Chinese (Seal Script) Typefaces

Thesis Proposal for the  
Master of Fine Arts Degree

Xuan Zhang  
Rochester Institute of Technology  
College of Imaging Arts and Sciences  
School of Design  
Graphic Design
This Proposal contains a substantial amount of information on the history and terminology of Asian writing and typography. Therefore, I include a prefatory introduction on Chinese and Japanese and calligraphy and typefaces.

### Timeline of Chinese Calligraphy
The type designer Xiangchen Li has made a chart for the history of Chinese typefaces. It is a good visual explanation on different styles. The sequence of milestone on Calligraphy could be simplified as below:

<table>
<thead>
<tr>
<th>Script Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Bone Script</td>
<td>1200 BC – 1050 BC</td>
</tr>
<tr>
<td>Seal Script</td>
<td>250 BC</td>
</tr>
<tr>
<td>Clerical script</td>
<td>200 BC</td>
</tr>
<tr>
<td>Cursive Script</td>
<td>200 AD</td>
</tr>
<tr>
<td>Regular script</td>
<td>400 AD</td>
</tr>
<tr>
<td>Semi-cursive script</td>
<td>950 AD</td>
</tr>
</tbody>
</table>

The history chart made by Xiangchen Li. 
[http://typeland.com/chart/chart.gif](http://typeland.com/chart/chart.gif)

### Timeline of Chinese Print Types
The earliest surviving sample of Chinese Woodblock printing date back to 868 AD. Around 1050 AD, during the Song Dynasty, the artisan Bi Shen invented printing with movable type, 400 years earlier than Johannes Gutenberg’s 42-line Bible. Type making has always been treated as a craft in China even though its origin is in the art of calligraphy. The styles of Chinese and Japanese printing types have developed into a separate branch of writing – typography. The historical sequence of Chinese printing types may be simplified as below.

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Song (Mincho)</td>
<td>1553 AD, founded in Mozi (《墨子》)</td>
</tr>
<tr>
<td>Fangsong(Songcho)</td>
<td>1916 AD, appeared as Juzhen Fangsong (聚珍仿宋) designed by Shanzhi &amp; Fuzhi Ding (丁善之, 丁辅之)</td>
</tr>
<tr>
<td>Hei(Gothic)</td>
<td>about 1895 AD in Japan, about 1951 AD in China</td>
</tr>
</tbody>
</table>
Seal Script

Seal Script is a broad category of calligraphic styles. It contains bronze inscriptional writing, silk-based writing, Bird-worm Seal Script, Big Seal Script and Small Seal Script. Small Seal Script is specifically known as common “Seal Script” to the Chinese reading public. Though the name Seal Script (篆) originally meant carving, later its use was limited to personal and official seals. This was the origin of the name “Seal Script”. In seals, its style has changed over time, resulting in several variations, some retaining their original clarity and legibility, others becoming highly decorative but less legible.

The Seal Script focused in this thesis is Small Seal Script. If a particular variant of Seal script is not specifically identified, Small Seal Script is meant.

Song/Mincho style

The geometric Chinese type style with triangle-shape serifs is generally called Song(宋体) style in China, because the invention of Chinese movable type is dated in Song Dynasty (宋朝). The Chinese named this printing type style after the period.

The Japanese learned printing technology from China, and they tended to distinguish type styles in detail, naming a type style by the exact period it was developed or borrowed by the Japanese from China. The graphical prototype of Song style was, according to Chinese sources, actually created during the Ming Dynasty (明朝). The earliest surviving sample of it is in the book Mozi (墨子) published in 1553 AD.

Hence, the Japanese named it Mincho style, because the Japanese word for Ming is "Mincho". This style is familiar to Western computer uses, as in the typeface Kozuka Mincho on Macintosh.
Fangsong/Soucho/Imitation Song style/仿宋/宋朝体

Fangsong is a print type style has visual aspects from both Regular Script calligraphic style and Song style. The strokes tend to be more vertical and horizontal compared with Regular Script, but it does not have the triangle-shaped serif like Song style.

Soucho style is defined by the Japanese typographers. It is not another name of Sung style but the Japanese name of Fangsong style. According to its name, it is the exact type style born in Song Dynasty (宋朝 reads Soucho in Japan), literally.

It is not a historical style between the Regular Script and Song style. In fact it came out rather later, at 1916. But it is still popular for people like its clearance and calligraphic appearance. Based on the visual appearance, it is more similar to the Regular Script calligraphy.

Libian/Liding (Transformation/Confirmation of Clerical Script) 隶变/定

It is not a name of certain style, but the process in which Seal Script was transformed into Clerical Script. It occurred between the Qin and Han Dynasties, around 200 BC–200 AD. Clerical script is already very similar to Regular Script, so study of Libian could help us understand how to translate the archaic script into modern Chinese characters.
Hei (Gothic) 黑
Hei style is the Chinese name for the Japanese Gothic style. Japanese writing was borrowed from China, but Hei style is a Chinese borrowing of a particular variant of Japanese character style. A translation on the Japanese definition of Gothic style is –
A type style with an even stroke weight on both vertical and horizontal strokes, and without any decorative features (serif) at the end of every stroke. It is like the Western Sans-serif, but different from the Gothic Script in English, which means Blackletter. The same style in China is called Hei. It is strongly influenced by the Western Sans-serif. Most of the Hei/Gothic style typefaces have concave endings of strokes like humanist sans-serif typeface Optima. But the reason for keeping that concavity is not known today, Chinese researchers do not agree about this. However, we know that concave stroke terminations in Optima have historical antecedents in the Western lettering tradition.

Simple/Sole Character (独体字)
I made up the translation because I haven't found any official translation on this so far. Some scholars prefer the name Simple Character because it shows the simplicity of structure.

The Simple Character is opposite to the Compound Character in definition. Among the 6 Chinese character classifications (Pictograms, Simple Ideograms, Ideogrammatic Compounds, Rebus/Phonetic Loan, Phono-semantic Compound, Derivative cognates), the Simple Characters are classed either in the Pictograms group or the Simple Ideograms group. There are only about 300 of the Simple Characters, which is a small group in Chinese, which has more than 30,000 characters. But, these characters combined in different compositions make up most of the rest of Chinese characters, for which they are also call “Origins of Characters”.

Optima Roman & Founder Hei
### Simplified Chinese and Simplification of Chinese

In order to facilitate and promote literacy, the government of the People’s Republic of China has published two simplification standards for Chinese characters, in 1956 and 1977. The second publication in 1977 has since been cancelled, but the revision of 1956 was re-published as a standard in 1986 and is the current version of Chinese script used in the People’s Republic of China and Singapore. The traditional script is still used in [Taiwan, etc.]

Japanese Kanji characters, which are versions of Chinese characters, have been simplified in a different way in Japan. The resulting Japanese Kanji simplification is called Touyou Kanji (当用汉字). The list of the simplified Kanji was first published in 1946, and was replaced by a new list, Jouyou Kanji (常用汉字), in 1981.

Seal Script, the subject of this proposal, originated more than two thousand years before the modern simplified Chinese, and therefore Seal Script characters were written only in traditional Chinese form, but the spirit of simplification can be applied consistently to the Chinese writing system. Some scholars insist on going back to use the traditional Chinese, but personally I do not agree with that. If the simplification is logically reasonable and artistically appropriate, there is no reason not to modernize and ancient form of script, because the history of Chinese writing has many instances of modernization, and well as many revivals of ancient forms. As the users of the only remaining logographic writing system, Chinese designers may adapt their heritage to modern circumstances and design problems. Analogous practices in Western design include the revival of historical typefaces, like Adobe Garamond and Jan Tschichold’s Sabon, based on 16th century typefaces, or Adrian Frutiger’s Herculaneum, based on Roman informal writing of the first century AD.
Calligraphy 书法
The word Calligraphy (Shu Fa) literally means the Law/Logic of Writing in China, and the Dao of Writing in Japan. It differs from Western calligraphy not only in the tools and media, but also in philosophy. For example, Chinese calligraphers may write variations of characters even they have a well-trained hand. The famous calligraphic work Lantingji Xu has 21 variants of the “之” character in total, and they are all different. Connoisseurs highly appreciate this for they think the calligrapher, Xizhi Wang, has given each of the 21 same character different characteristic. Even in the single strokes of a simple character, the viewer could have a peek at the vast universe in multiple dimensions.

Lantingji Xu
Xizhi Wang
353 AD
http://zh.wikipedia.org/wiki/File:LantingXu.jpg
Western and Eastern Typography

In the history of Western typography, the beginning of type design was the work of craftsmen; they translated the current scribal handwriting into metal type. This general procedure of translating handwriting into type is similar in both European and Chinese type design. An old style serif face like Garamond retains traces of scribal calligraphic handwriting. The letter forms are not strictly geometric. The modulations of thick and thin strokes show the traces of the scribal pen. Although Renaissance scholars and artists demonstrated how Roman capital letters could be constructed geometrically with perfectly circular arcs and straight lines, in actual practice, scribes, and later, type punch-cutters, shaped letters by hand, not geometry, and the types show those manual origins.

Later typefaces evolved to the high-contrast Modern styles like Bodoni, and, beginning in the 19th century, the sans-serif style evolved into favored type form of the revolution of Modernism, e.g. Helvetica. Serifed typefaces like Bodoni and Clarendon can still be recognized as coming from the old serifed styles of movable types, but the sans-serif typeface is a new exploration in the modern period. Nowadays, graphic designers are not limited to the venerable calligraphic styles; instead, they can view letterform shapes as sculptural forms and the spacings between the black and white elements as studies in positive and negative space.
Chinese Typeface

The Eastern typeface has gone through the similar progress. The Chinese have invented the movable types 400 years before Johannes Gutenberg, and they also followed the style of traditional calligraphy. As the characters are really complex, to find the balance of the characters’ structure could be a lot of work, and the variation of calligraphic brush strokes even became a nightmare of the type cutter. The long history of Chinese printing is a history that type cutters simplified the characters—the print type’s strokes went from calligraphic to more geometric; later in the Qing Dynasty, the movable types’ strokes became perfectly vertical and horizontal.

From about 1840, China has entered a period of war, and the type design has been ignored for a long time. After so many years of wars, People have paid their attentions to the type design again since the founding of the Republic. The Chinese has learned the Hei style—the Eastern sans-serif—from Japan, which is influenced a lot from the Modernism.

For usage of typefaces on the digital media platforms in the modern age, the Chinese type design faces two main problems.

The first one is the quantity of characters. As Chinese is a logographic language, it used to be big problem to contain that many (over 6000) commonly used characters in a font file. But through the development of Unicode, it is no longer a big problem. Though some language researchers argue on the proper logic of giving a unique code to each characters, it is not what we are going to discuss in this thesis.
The second one is about the glyph design. Firstly, it is a huge project to design the glyphs of all the characters. Under government standard of character software support GB2312, type designer need to design all 6763 characters that it contains, because they are all distinguished as commonly used characters. In the latest released government standard GB 18030-2005, the number of characters has increased to 70244. Though most of time designers do not need to design all of them, there do be more characters that they need to work on. Besides, it is a requirement to make the design consistent, in all the languages the typeface supports. Here is a good sample of Kohinoor Devanagari and Kohinoor Latin.

The current situation is, type design in Latin has gone much further than in any other language system, but it is universal because of the global usage of English. But the Latin in Chinese typeface design is often not well designed, sometimes even been described as horrible by Chinese graphic designers. That is the reason why Adobe InDesign in other language (non-English) has a function named Typeface Composition (translated as 复合字体 in Chinese version) under Type menu. This useful function allows you to use the characters/hiragana/etc. in an Asian typefaces, but alternative Latin and numeric from another font.
The goal of the thesis project is to design a Latin typeface based on an existing Chinese digital font, Founder Small Seal Script (方正小篆体). The Latin letters should harmonize with the Chinese characters in Founder Small Seal Script.

After I roughly went through the history of typefaces, there is something that interests me in the Western typography. Even the Western typeface goes back to the old time when seal script was born, around 200 BC, it is still readable. The sample could be the simulation typeface Herculanum and Rusticana, which are based on informal writing and graffiti written between 100 BC and 100 AD. Though it has the archaic look, it does not lose the function, so when it was digitized for the computer, it is a usable face to convey information.

But Chinese characters is a pictogram system, unlike the Latin which is a language based on sound. So as it develops in a huge area, it varies not only in sound, but also in shapes. So as time flies, the old style, including the Seal Script I am researching on, has not only lost the popularity in design, but also the function. Even well-educated native speaker, if they don't have researches or understanding of the historical calligraphy style, they cannot read it anymore.

As we mentioned earlier in the proposal, Chinese font contains Latin alphabet and Arabic numeric (and also the Western punctuations), which are universal. But generally speaking, the glyphs of Latin alphabet are not well-designed, especially for those calligraphic fonts. Neither does the Founder Small Seal Script.

The Latin part of Founder Small Seal Script could be treated a simulation typeface designed after a unique or stereotypical aspect of the letterforms or Small Seal Script. Founder did revise some of their typefaces. Sometimes the mark of revision is that Truetype font is updated to Opentype, sometimes
Problem Statement

it is still a Truetype font but updated to GBK (the government standard between GB2312 and GB18030, a little earlier than GB12345). But Founder Small Seal Script has not been revised, and the main reason for this is Seal Script does not contain that many characters when it was formed. I believe the most of work on design of Founder Small Seal Script is to make up the characters that never existed before in Seal Script. And the Latin letters' design in it just keeps the brush stroke but lose the spirit of Seal Script.

Here is the question: We are now re-designing the Latin letters in Founder Small Seal Script. What's the principle that the Latin alphabet glyphs for this very calligraphic Chinese typeface should follow?

What is the main concern in new principle of design, Readability or Visual Style? Talking about visual style, should it focus more on the Eastern appearance to the English-speaking audience, or more on the accurate archaic methods of building Seal Script characters’ strokes? The logic of design should be thinking of the component of strokes like western type design, or treating all the letters as Simple Character Units (独体字)?
Inspirations

Wenquanyi has begun an open-source type design project under GNU Free Documentation License for a long time. It is a Chinese type design project, and allows everyone to add or adjust the character design into their font. They have web application in which you may use strokes to build characters now, but their old application asks people to build characters in pixels. From the current view, thinking with pixels is definitely not a good way to build the type design logic. http://wenq.org/

Some people have already tried to experiment with Song style. The type design studio Redesign.HK use the specific strokes of Song style to build the Latin letters. The result turns to be impressive somehow, but it is still hard to read. Besides, it only has the capitals. This is a way of thinking – replacing the strokes of letters with Chinese ones. The logic is to build a series of strokes, then combine them into types.

However, this is not the only way. If every Latin letter is treated as Simple Characters (独体字), the logic is to draw every letter separately. But, you need to be exactly sure, that you are doing every letter right with the understanding of spirit within Seal Script.

Sample of Songti Yinwen designed by Redesign.HK http://redesign.hk/songtiying.htm
A View of Early Typography: Up to About 1600
Harry Carter

As Mathew Carter’s father, Harry Carter did pass the valuable historical technique and knowledge to the next generation. He showed some interesting view on typeface in his book. A View of Early Typography has long been regarded as the classic text on the production and use of type in the first 150 years of printing. By focusing on type, Harry Carter goes to the heart of design, the point at which the material processes of printing meet the intellectual concerns of publishers and the nature of the texts they publish. He discussed the diversity of letterforms (blackletter, roman, italic, and more); the tensions between Latin and the vernacular languages; and the establishment of standards of norms in type design.

Creative Type: A Sourcebook of Classic and Contemporary Letterforms
Cees W. de Jong
Alston W. Purvis
Friedrich Friedl

It is so-called A dynamic visual record of typeface evolution, focusing on the last twenty years. Probably not that dynamic, but this book still works well as a type specimen. Thy not only show the modern typeface design, but also a brief introduction for each face set in that very font. The layout could be better, but it’s enough for a sourcebook providing information. Here is some interesting idea in the fore word, which doesn’t have an answer. Letters are being re-read and adapted, changed or re-designed; that is the way it has always been. There are no less than 400 different Bodonis, probably because people always think they can improve or add something. New is better?!

20 Century Type Designers
Sebastian Carter

The book has included an examination of the technological developments in the design and composition of type, and introduces the work from some of the more recent designers. In the computer age, some people forget the connection between the calligraphy and the cut metal type. This book is about this kind of completely new way of type design. Although the skeleton shapes of the letters of our alphabet hardly change, many skilled type designers have devoted much time, sometimes their whole lives, to drawing different versions of the outlines. This book serves as an introduction to the concept of typefaces and to some of the personalities who have created them - Goudy, Rogers, Koch, Gill, Morison, Van Krimpen, Trump, Tschichold, Frutiger, and Zapf - and places them in the context of the enormous changes that have occurred the 20th century in the methods of creating and setting type.
**An A-Z of Type Designers**
Neil Macmillan

This large volume book features a comprehensive listing of outstanding type designers from around the world, ranging from Johann Gutenberg to the present day. Arranged alphabetically by designer, it is a very good source when you want to find information on a certain designer, including many of whom are among the field's most renowned – like Morris Fuller Benton, Matthew Carter, Adrian Frutiger, Claude Garamond, Eric Gill, Frederic W. Goudy, Bruce Rogers, and Hermann Zapf. It also showed the applied designs from them, poster, book cover, etc.

For thesis, it is a nice reference book for you to begin with information search.

**About Alphabets: Some Marginal Notes on Type Design**
Hermann Zapf

I cannot describe the exact feeling towards Optima (Regular). To me it is like the very right typeface, though it is judged by visual instinct. I love this beautiful design presented by Hermann Zapf, and also curious on the designer himself.

Type is the tie or ligature between author and reader, and it is much to be desired that readers become more critical and gradually more sensitive about the choice of type in a book. In this connection the question arises whether our modern book production shows generally that unity of content and form common, for example, among the books of the 15th and 16th and even later centuries. Why is this unity generally lost?...Books of historical content, books that seek to produce a certain mood or atmosphere in the reader, such books may continue to be set in historical or classical types—I do this myself in my own typographic works. On the other hand there are available so many devices expressive of our time that we ought not to banish them when we design books for our time.”

What the typeface means to the traditional media, I am still thinking about that.

**Calligraphic Type Design in the Digital Age: An Exhibition in Honor of the Contributions of Hermann and Gudrun Zapf**
John Presitanni

Over the past 50 years Hermann and Gudrun Zapf have designed some of the modern world's most unique and innovative typefaces. The products they called Black and White Art are serving well for our better visual environment now.

Calligraphic Type Design in the Digital Age is the catalog to the exhibition which also features the work and interview from 14 other calligrapher/type designers who have been influenced by the Zapf's work. And they are Robert Slimbach, Alan Blackman, Rick Cusick, Jean Evans, Jacqueline Sakwa,
It is really lucky that you can work on something you love and also are good at.

**Type Design: Radical Innovations and Experimentation**

*Teal Triggs*

Though digital tools may have allowed designers new power and flexibility, typography remains the bedrock of good graphics, and one of the most exciting areas of experimentation. Despite the myriad collections of type design produced, no one has before attempted a thematic and critical overview of digital typography and the oft-unpublished radical works that lead to these designs. Like the other books, This book also contains work of dozens of typographers from around the world, but is unique for illuminating the history of digital typography from its physical properties and production methods, through the development of typographic styles, to the full diversity of its uses in print, architecture, film, TV, and other media.

**Explanation on the Origins of Characters**

*Zhen Xu*

This book is written in archaic Chinese, which may be hard to translate nowadays. The book's name means “Explanation to the characters” literally. In fact, this book is the most important book on the Chinese characters, which talk on both meaning and origins of Chinese characters. It is also the largest dictionary for Seal Script samples as I know.

**Explanation on the Origins of Characters**

*Yucai Duan*

Since the book 说文解字 is written in ancient Chinese at around 100 AD, 1700 years later it becomes really difficult to understand. So Yucai Duan (段玉裁) has written this book as additional explanations. It was finished in 1808 AD and first published in 1815.

**Basis on the Characters’ Structure**

*Xiaoli Zou 邹晓丽*


**Written Letters: 33 Alphabets for Calligraphers**

*Jacqueline Svaren*

From 1975 to 1985, Jacqueline has updated the original Written Letters: 33 Alphabets for Calligraphers to Written Letters: 22 Alphabets for Calligraphers. It is a beautiful hand written book to start the practice of English calligraphy.
(Some other books are in the to-read list under latest suggestion from committees, but I have not started reading yet. They may be added later during the progress of thesis.)
Methodology

The idealistic final goal is a completed typeface that contains all ASCII printable glyphs.

Production for the final exhibition would be printed samples of applied design with the font.

Glyph design would be finished in Adobe Illustrator and then exported to Type Tool to build the usable font file.

The applied designs would also be given to people with online survey to get feedback. The feedback is part of the evaluation.
Implementation and Design Ideation

Attempt on two directions would be done approaching to final goal

1. Calligraphy Aspect

The type design comes from the historical type styles, and it particularly requires understanding of both Eastern and Western calligraphy. So it is hoped that the history from traditional Calligraphy to the modern digital fonts should be studied.

To create a calligraphic typeface including the main printable glyphs from ASCII, it is necessary to have a certain level of calligraphy proficiency. Independent study of Western calligraphy would be carried on, as basis of all the design works. The style to be practiced should be Italic and Black letter, and might be changed according to committee’s suggestion.

For aspect of Chinese calligraphy, it is a little bit hard to gain enough instructions currently. However, Seal Script is originally carved on solid surface, it is impossible to perfectly simulate the Seal Script with any media other than the metal (blade) and stone. But it is still important to understand this very historical style. In Chinese philosophy of calligraphy, they believe there is Qi, which means spiritual power, within every brush strokes. In my opinion, as the book 说文解字 has the largest character pool, the most efficient way of approaching the spirit of Seal Script is to begin copying the characters by hand from now on.

Calligraphy is not a difficult task. The simplest way is the best. Through practice you would not only remember how to write with the heritage of human civilization, but also get closer towards the pure forms of language.
2. Type Design Aspect

2.1 Old style typeface revision
The progress from a scan copy of old script to a clean-edged font file is important. I do not need to do this work in this project, but it is important to study the method of translating the strokes in an old script to a high-quality digitized font.

Chinese type designer Xiangchen Li is working on the revision of Juzhen Fangsong. It would be great if I can see his on-going progress within this year. However, he has already finished the typeface Typeland Lehshie Lehsho, which is originally an academic font for studying Lehshie. Luckily he has also offered the glyph formulate and also the glyph order to the buyers, so I am still able to study into a finished typeface. Under this aspect, there is also a technical problem I am curious in, how to give alternative glyph to the same letter/character?

2.2 Type design experiment
As the logic of building this very typeface is the main problem of thesis, I will try some methods to produce some letters in Illustrator for experiment. The suggestion from discussion with committees would decide the next step of design.
Type design might be published in some online font store like http://www.dafont.com/ for non-commercial use. Whether it would charge an authorization fee depends on the final result. In case the conclusion reached turns to be a failed experiment (the existing design is better somehow, either in forms or usability), it could just be a free font.

All Researches related with the project could also be published, if they might benefit someone who also does some study on the Asian typefaces.

There will be a printed copy of this thesis in the RIT Archives and the Graduate Graphic Design Program as well as I will submit electronic copies to the RIT Digital Media Library, and ProQuest/UMI.

**Budget**

<table>
<thead>
<tr>
<th>Expense</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorization of academic use of Founder’s typefaces</td>
<td>$3000</td>
</tr>
<tr>
<td>Software Type Tool 3 purchase</td>
<td>$55</td>
</tr>
<tr>
<td>Thesis Show</td>
<td>$200</td>
</tr>
<tr>
<td>Thesis print and binding</td>
<td>$200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$3455</td>
</tr>
</tbody>
</table>
In the winter quarter, the lower case letters are supposed to be finished. And in the spring quarter, the capitals and the rest of glyphs in ASCII would be finished.

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Quarter</td>
<td>Writing Proposal</td>
<td>Document Project</td>
<td>Research</td>
<td>Literature Research</td>
<td>Thesis Proposal Update</td>
<td>Lower Case Design</td>
<td>Capsule Design</td>
<td>Numeric Design</td>
<td>Other Glyphs</td>
<td>Thesis Show</td>
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<tr>
<td>Winter Quarter</td>
<td>Week 1</td>
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<td>Week 4</td>
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<td>Week 9</td>
<td>Week 10</td>
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</tr>
<tr>
<td>Spring Quarter</td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 3</td>
<td>Week 4</td>
<td>Week 5</td>
<td>Week 6</td>
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<td>Week 8</td>
<td>Week 9</td>
<td>Week 10</td>
<td>Week 11</td>
</tr>
</tbody>
</table>
Generally speaking, it could be imagined that this type design tends to be more artistic and decorative. The most possible way to use it may be on packaging design. It is not easy to judge it by set as a running text.

Probably the idealistic evaluation is like this — the finished font should be given to a trusted group of illustrator and designers, in hope they may try to use it so the applied design would be seen. Besides, the designer would simulate some case of use and do some applied design, too.

However, with the consideration of limited time, it is applicable to get some feedback by online surveys. I will include the type design and the applied design of it as samples, and ask people for their feedback. There is no limit on the target audiences. Anyone who speaks any language could do the survey.
1) http://ja.wikipedia.org/wiki/%E3%82%B4%E3%82%BF%E3%83%83%E3%82%AF%E4%BD%93
2) Creative Type: A Sourcebook of Classic and Contemporary Letterforms, Cees W. de Jong, Alston W. Purvis, Friedrich Friedl
3) 20 Century Type Designers
   Sebastian Carter
4) An A-Z of Type Designers
   Neil Macmillan
5) About Alphabets: Some Marginal Notes on Type Design
   Hermann Zapf
6) Calligraphic Type Design in the Digital Age: An Exhibition in Honor of the Contributions of Hermann and Gudrun Zapf
   John Prestanini
7) Type Design: Radical Innovations and Experimentation
   Teal Triggs
8) 说文解字
   许慎
9) 说文解字注
   段玉裁
10) 基础汉字形又释源
    邹晓丽
11) Written Letters: 33 Alphabets for Calligraphers
    Jacqueline Svaren
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This book is typeset with \textit{Marco},
designed by Toshi Omagari;
& \textit{Hanyi Qihei (汉仪旗黑)},
designed by Qi Li & Hanyi Design Team.