

## Manuscript submitted to Interactions: Lessons learned

### Sketching with Chinese calligraphy

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Sketches and hand drawn paper prototypes have become popular tools – they are quick to make, inexpensive and cannot be mistaken for the final product. When little effort is needed to draw, it is easier to discard drawings and ideas and replace them with new and improved versions. Moreover, during ideation it is important to be able to quickly capture the ideas on paper while they are flowing. As one speeds up the drawing, the sketches may become unclear and harder to interpret. This article illustrates how Chinese calligraphy can serve as inspiration to speed up sketching while maintaining a clear, consistent and attractive style.

After introducing the basic principles of Chinese calligraphy, we showcase character elements that resemble user interface components and demonstrate how calligraphy techniques can be used to proportion the overall user interface structure.

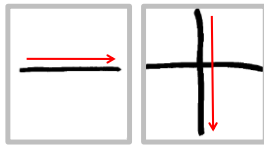
### Chinese calligraphy basics

Written Chinese is the common glue that bridges many spoken languages including the many Chinese dialects, Japanese, Korean and old Vietnamese. There are two systems in use, that is, traditional and simplified characters. Simplified characters were introduced as stripped-down versions of the traditional characters during the Communist reign in China, while the traditional characters are still used in Taiwan and Hong Kong. Here we are mainly focusing on traditional characters as they contain details that resemble user interface components.

Chinese calligraphy requires techniques acquired through practice which slavishly following specific rules which give the Chinese characters their unique visual style. In fact, most westerners are able to produce reasonably good Chinese characters with relatively little training – all that is needed is to learn the basic rules and some practice drawing the basic shapes, called radicals, that are used in the construction of more complex characters. The rules of constructing Chinese characters can be summarized as follows:

1. Horizontal stroke first, then vertical stroke.
2. Left falling stroke first, then right falling stroke.
3. From left to right.
4. From top to bottom.
5. From outer to inner.
6. Outer sealing first, then the inner sealing.
7. First the middle, then the two sides if the two sides are small.

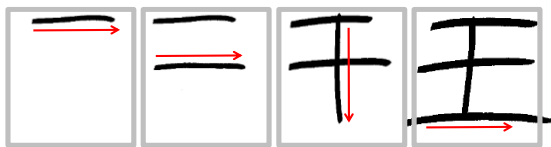
Strokes are drawn from left to right or top to bottom. Between each stroke the pen leaves the papers. For example, to draw a simple cross (shi) one first draws the horizontal stroke from left to right, lifts the pen, and then draws the vertical stroke from top to bottom.



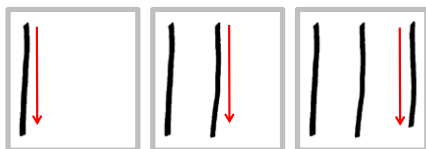
To draw the 'plus like character shí meaning ten: First draw the horizontal stroke from left to right, then the vertical stroke from top to bottom (rule 1).



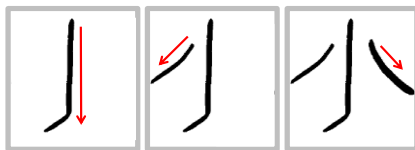
Gān meaning stem: First draw the top horizontal stroke (rule 1), then the second horizontal stroke (rule 4), and finally draw the vertical line.



Wáng meaning king: First draw the gān character (above), then draw the bottom horizontal stroke. The last stroke (rule 6 sealing last) ensures that the bottom line is perfectly aligned with the vertical line.



Chuān meaning river: First draw the left line, then the middle line and finally the right line (rule 3 from left to right). All the strokes are drawn from top to bottom.



If the middle element is larger than the elements on the left and the right, as it is for the character 'little' (xiao), then first draw the middle element, then the elements on the left and the right (rule 7 overrides rule 2).



Tóng (simplified) meaning colleague: Start from the outside and go inward (rule 5). First draw the surrounding frame, then draw the cross in the middle.

The tong character is turned into a checkbox by sealing the bottom with a horizontal stroke.

## Characters resembling user interface components

**RECTANGLES:** The rectangle is a versatile shape that can represent buttons, text fields, pull down menus, user interface views, a portion of a view, image, etc. The 'Kou' character (mouth) resembles a rectangle:

1. Draw the left vertical line in one downward stroke.
2. Draw the top horizontal line and right vertical lines in one continuous stroke, starting at the top left ending at the right bottom. It is ok if the stroke has a smooth arc-like shape as the three other corners will ensure the rectangular impression.
3. Close the rectangle with the bottom vertical line using one stroke from left to right.

**GRIDS:** The character ri (sun) looks like a simple grid with two rectangles stacked on top of each other. Construct it by first drawing the strokes for the surrounding rectangle (rule 5 from outer to inner). Then, draw the middle horizontal line and finally the bottom horizontal line.

The character mu (eye) shows three rectangles stacked on top of each other. Construct it by first drawing the surrounding lines on the left, top and right. Then, draw the three remaining horizontal lines from top to bottom.

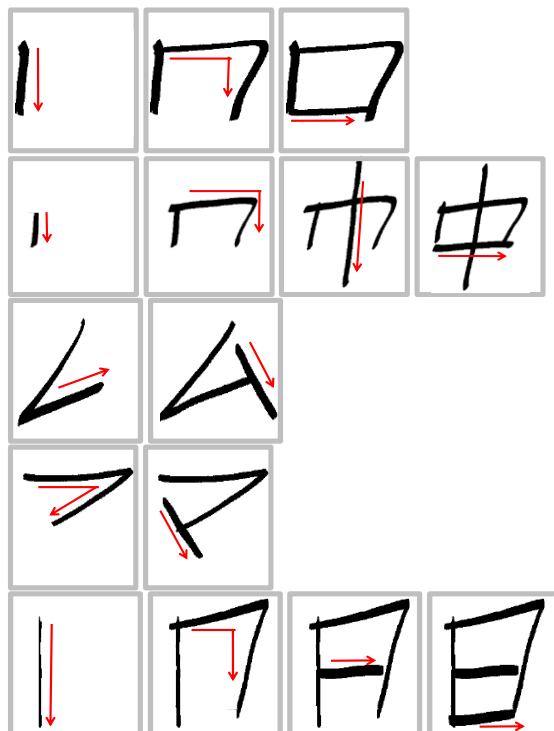
Tian (field) looks like four rectangles stacked in a two-by-two pattern. Again, first draw the left, top and right line outlining the frame, then construct the cross in the middle by first drawing the middle horizontal line, followed by the middle vertical line. Finally, draw the bottom horizontal line that closes the outside rectangle.

**SLIDERS:** Zhong (center) looks like a slider with its vertical line intersected by the rectangle in the middle. First draw the rectangle without the closing seal, then draw the vertical line running through the rectangle, and finally draw the bottom horizontal line to close the rectangle. For long sliders one may deviate from the rule and start with the vertical lines to ensure the overall structure. Then draw the knob in the desired position.

**ARROWS:** Parts of the two characters 'tai' (platform) and 'ling' (zero) resemble arrow up and arrow down such as those seen on scrollbars. Use two strokes to draw the top part of tai as an upward arrow. First, draw a diagonal stroke down-left and then horizontally right. Then, draw a diagonal stroke down-right.

Similarly, the bottom part of 'ling' can resemble a downward arrow. First, draw a stroke going horizontally right and then diagonally down-right. Second, draw a diagonal down-left stroke.

mandarin kǒu  
meaning mouth  
purpose rectangle button, frame



mandarin zhōng  
meaning middle  
purpose slider

mandarin tái 台  
meaning platform  
top part  
purpose arrow up

mandarin líng 零  
meaning zero  
bottom part  
purpose arrow down

mandarin rì  
meaning sun  
purpose grid

mandarin mù  
meaning eye  
purpose grid

mandarin tián  
meaning field  
purpose grid

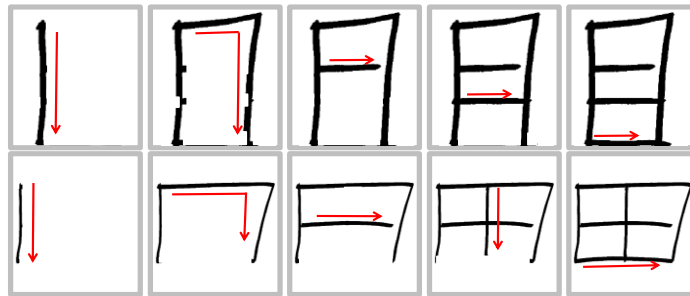


Figure caption: Useful Chinese characters that resemble user interface components.

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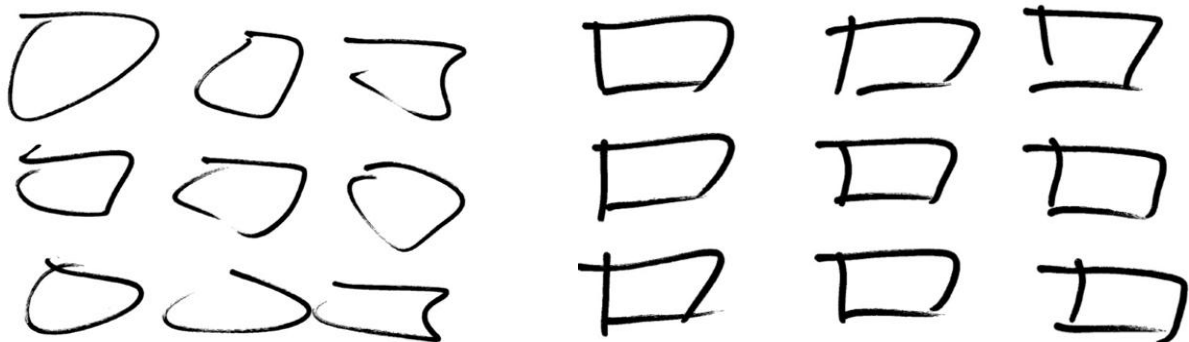


Figure caption: Grid of rectangles that could resemble a panel of buttons drawn very quickly without specific technique (left) and with technique inspired by Chinese calligraphy (right).

Although it is trivial to draw rectangles, it is difficult to draw rectangles quickly that look rectangular. Many people draw rectangles using a single stroke, and when drawing quickly, the rectangles lose their corners. The three strokes making up a Chinese calligraphy rectangle ensure that three of the corners are distinct. The rectangles therefore appear rectangular even when drawn quickly.

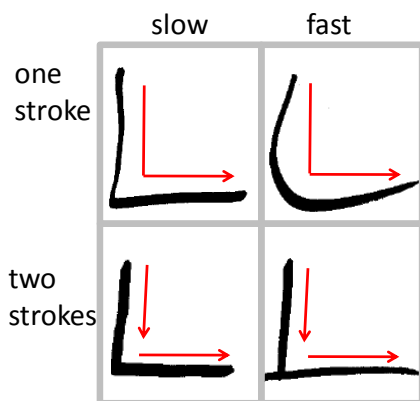


Figure caption: Drawing speed affects our ability to draw 90 degree angles because of the hand momentum. At high speeds the resulting shapes look more circular than rectangular. By dividing the motion into separate strokes, the rectangle corners become more distinct.

--- END info box SPEED VS PRECISION ---

--- BEGIN info box WESTERN STROKE ORDER RULES ---



Figure caption: The digit 5 is correctly written by first drawing the bottom part (left), then adding the top line (middle) or incorrectly in a single stroke (right)

We are taught to draw letters and digits according to certain rules. For example, the digit 5 is drawn by starting with the vertical line, then the half circle and finally, the horizontal line at the top. The resulting digit will have a sharp 90-degree angle on the top left corner. However, the digit 5 is often drawn in a single continuous stroke starting at the top, ending at the bottom. When writing quickly, it is hard to achieve the sharp 90-degree angle in the top left part, and the resulting character will be indistinguishable from the letter S.

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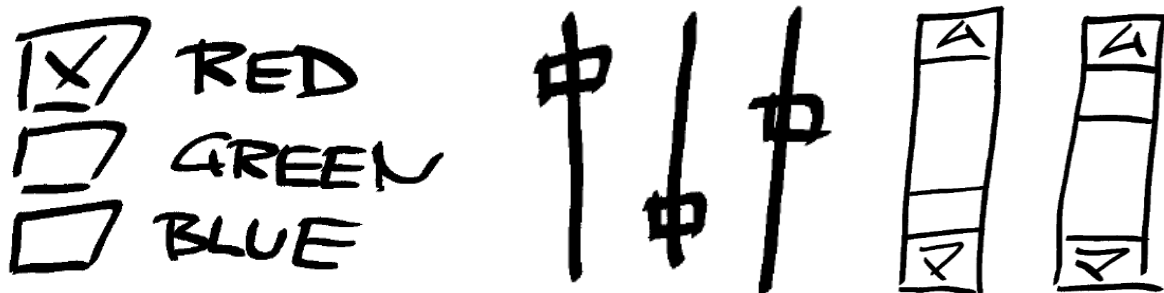
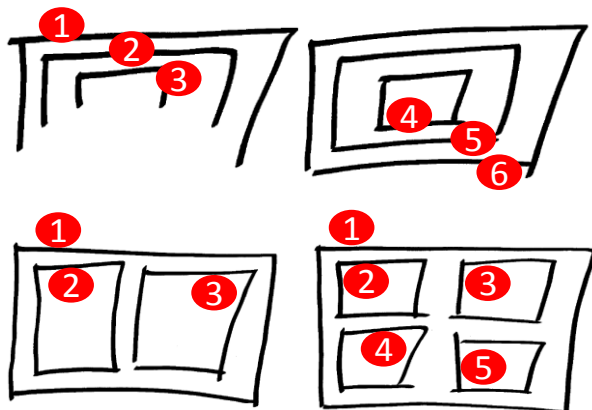


Figure caption: Demonstration of how basic Chinese characters can be used to sketch user interfaces: checkboxes with extended 'tong' and 'kou' (left), sliders with 'zhong' (middle) and scrollbars with arrows using 'kou' and parts of 'tai' and 'ling' (right).



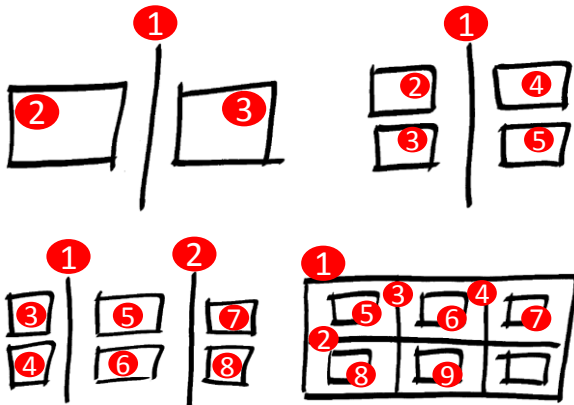


Figure caption: User interface structure and proportion are achieved by beginning with the big picture and going into detail following the rules of outside and inwards, from left to right, top to bottom and from larger to smaller.

## Structuring the user interface

1. Start with the overall structure, and work from no details to increasing level of details. Go from outer to inner (rule 5) by first drawing the overall frame, then sub-frames, and so forth. This is similar to Western drawing technique, where the artist focuses on the overall proportions first, then on the increasing level of detail.
2. Draw sub-frames and other components from left to right (rule 3), then from top to bottom (rule 4). Examples of such components include buttons, radio-buttons and form fields.
3. Draw the largest components first, then the smaller components. The large components define the overall structure. The smaller components are filled in first on the left, then on the right, top and bottom, going from outer to inner. Dividing lines are an example of large elements that can divide the various parts of the user interface.

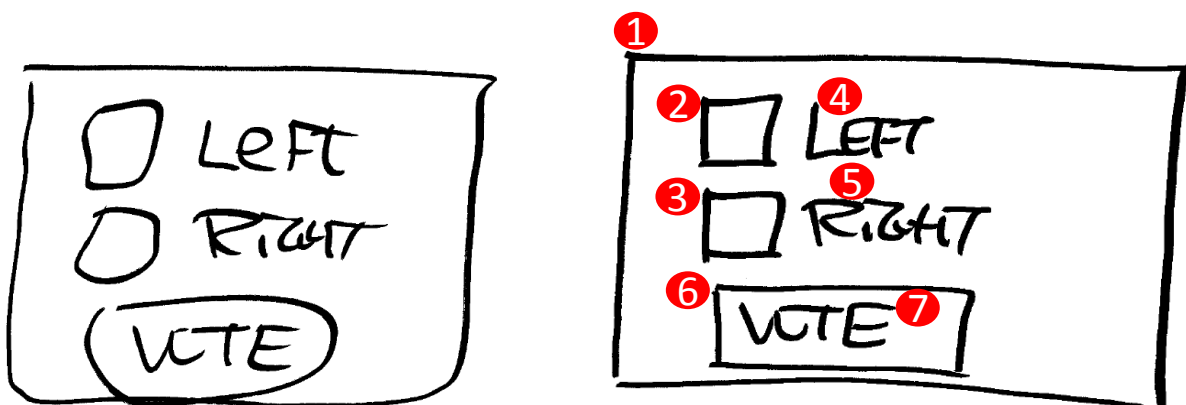


Figure caption: A user interface sketch drawn very quickly without specific technique (left) and with technique inspired by Chinese calligraphy (right). It takes approximately the same time to complete each sketch.

## Reaping the benefits through practice

Chinese schoolchildren start to practice the simple shapes to acquire the correct stroke orders. Drawing each shape just a few hundred times will give noticeable results. Once the stroke sequence is in the hand, one can practice to write the characters as quickly as possible while maintaining the correct stroke order and consistent style.

Chinese character practice books come printed with grids of squares where the student writes each character in each square such that all the space of the square is used. The student then also learns to control the sizing and proportions of the characters. It is easy to make such practice sheets oneself. Try starting with grids of 2 x 2 cm squares.

## You Now Know

By following the basic stroke order inspired by Chinese calligraphy, you can quickly draw recognizable and consistent sketches of user interfaces with distinct angles and balanced proportions. Several elements from Chinese characters look like user interface components and with practice these can be jotted down very quickly on paper. Proportions are ensured by starting on the outside with the overall shape and sketching inwards towards increased level of detail.