



# Gestalt Study on the Evolution of Motorcycle Front Face — Take Kawasaki Ninja ZX-10R for Example

Lixian Xie, Guangzhong Hu, Lin Ma, Zhen Lan, Mingjing Zeng

Sichuan University of Science & Engineering, Zigong 643000, Sichuan, China

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**Abstract:** China has become a major producer of motorcycles, but constant innovation and improvement on the design of motorcycles is still needed to shape its own brand image, hence to inherit and innovate the brand value. Based on this, in the design of motorcycle front face, gestalt psychological principle is used to build gestalt combination with visual recognition, and it will be inherited in the future modification, which will play an important role building their brand and design innovation. This method can provide reference for motorcycle modeling design.

**Keywords:** motorcycle, innovation, brand, modelling, gestalt

## 1. Introduction

Front façade, also known as the front face, is the first part to be noticed for motorcycles. Motorcycles of different brands are distinctive on front face modelling, sometimes the difference could be significant. Following the basic gestalt psychological principle, we can design motorcycle front face easily, building a brand image with visual recognition. Based on this method, the Kawasaki Ninja ZX-10R is introduced as the object for the retrospective study of motorcycle front face shape; analyses on the product lifeline, brand genetic elements, and the issue of keeping enduring impacts through times are also included.

## 2. The research background

### 2.1 Brand gene and motorcycle front face design

Front face modeling design is the most intuitive reflection of motorcycle modeling design. For the overall modeling design of the motorcycle, the front face design plays a vital role and directly reflects the characteristic genes of a brand. Kawasaki was founded in 1896 by Shozo Kawasaki who used to run a shipyard building marine steel ships. Kawasaki's business gradually expanded from building marine steam turbines, to locomotives, wagons, passenger cars and bridge girders. After World War II, Kawasaki began manufacturing motorcycles, a number of products were launched, such as extreme speed. NinjaZx-10r, NinjaZX-6R, Ninja650, Ninja400 and Ninja300, which were the premium motorcycle series of Kawasaki, gaining remarkable market among motorcycle enthusiasts. [1]

### 2.2 Gestalt theory

Gestalt psychology is one of the western modern psychological schools. Gestalt psychology believes that when an individual considers a certain behavior, he or she will first integrate or organize the research object with his or her own experience to form a gestalt that is easy to understand. The gestalt has the characteristic that the research object itself does not have, that is, the whole is greater than the sum of its parts [2].

## 3. Gestalt perception applied to Ninja ZX-10R front face design evolution

### 3.1 Ninja ZX-10R front face analysis

#### 3.1.1 The original gestalt

The 2004-2005 Ninja ZX-10R front face set the tone for the original design, which has been reflected in following versions. The contour line of the motorcycle's front face mask, the contour line of the guide cover and the contour line around the headlamp cover exhibit the same design language, but also reflect the sense of speed, giving the motorcycle a dynamic spirit. However, as an early product in the Ninja product line, there were notable design flaws, such as the sharpness of car style, which were incongruous with the round shape of the headlamp shade.

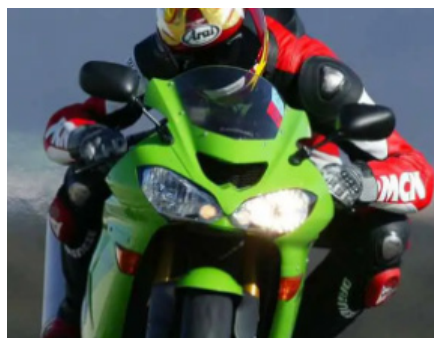


Figure 1. Kawasaki Ninja ZX-10R 2004-2005

### 3.1.2 A heightened sense for power

In 2006, two years after the Ninja ZX-10R's release, Kawasaki made some slight change to the look and feel of Ninja ZX-10R. Aerodynamics was applied in the design of a new deflector, and the sense of power and speed was highlighted by full shape design. On the front face mask, the size of the inwardly-shrinking air inlet is enlarged to improve the tightness of the overall shape, conveying the sense of strength as a track motorcycle, and highlighting the rapid spirit of Japanese ninjas.

### 3.1.3 Similarity law of headlamp contour and lampshade contour

According to the adjustments made in 2007-2008, the original exterior contour of the headlamp no longer exists, but is replaced by the dual-lamp design commonly known as "bug eye", which shows a similar law with the headlamp shade as shown by the picture below. At the same time, the fog lamps on the left and right sides of the headlamps echo each other, filling the vacant space of the design in the front lampshade. The left and right turn signals were also changed from the front face mask to the brackets of the rearview mirrors on both sides, achieving a complete closure effect.

### 3.1.4 Optimization of the whole front face

The 2011 model design update version stands for an unprecedented revolutionary change, the front face of the motorcycle from relatively round to full of geometric elements of the angular, closer to the modern motorcycle design ideas. The original shape design framework composed of the contour of the diversion hood, the front face mask and the contour of the lampshade have been adjusted. Deep air intakes extend downward to divide the front face mask, separating the left and right headlights of the motorcycle. Overall, this change makes the shape of the inverted triangle looks more powerful, highlighting the speed of the ninja. The Ninja ZX-10R also added a step-up design from the air inlet and air inlet mask to the initial design between the flow hood and the front face mask, and the front face headlamp and the lampshade.



Figure 2. Kawasaki Ninja ZX-10R 2011

### 3.1.5 Highlights of the design deviation brought by the original gestalt

In 2013, the adjustment was on the main dome, the original dome of curved surface shape was domed into three seemingly integral part, further highlighting the edge of the contour, before chimney reinforcement design of the face mask contour, the design showed more dynamics. At the same time, it also achieved higher compacted design among elements. In addition, in terms of the overall modeling design, the complexity has been significantly raised, however the integrity of the body modeling being weakened.

From the perspective of the adjustments made in 2016-2017, it has witnessed great changes in its design thinking. The

original figure bottom mutual set off and mutual influence. After the upgrade, the modelling of the year renewed the design choices and extend inlet, the model change is commonly known as “fish mouth”, making the appearance sharp and radical, reached a consistent law and achieved a completeness of the vision. At the same time, the air inlet is added on both sides of the deflector, which can effectively reduce the pressure on the deflector and improve the stability during high-speed driving, which reflects the Japanese ninja spirit more sudden and swift [3].

### 3.1.6 The evolution of the initial gestalt

Compared with the previous version, the modeling design version of 2020-2021 has a big change, ending the trend of increasing forward air inlet size, adopting a reverse tilt air inlet beside the headlights, with built-in small wings, making the modeling more gestalt. In order to highlight the headlamp as the visual center, the designer increased the size of the built-in wing beside the headlamp. This change not only makes the modeling design clearer and more concise, but also brings greater visual impact to customers. In addition to that, abandoning the design of the headlamp shade allows more preserved space, and the concave method is used to highlight the outline of the lamp set, thus further expressing the relationship between the headlamp and the outline of the lamp set, while also highlighting the rapid characteristics of the Japanese ninja spirit.



Figure 3. Kawasaki Ninja ZX-10R 2021

## 3.2 Ninja ZX-10R styling gene

As you can clearly see from this analysis, Ninja ZX-10R's gestalt design has evolved and innovated over times, with each generation continuing to use the original design structure while enhancing the overall Ninja look with power and speed, displaying the spirit of racetrack sports vehicle and Japanese Ninja. From this point of view, it is not difficult to see that for motorcycle modeling design, the continuation of gene not only is conducive to the building of brand image, but also can bring a positive effect on the formation of brand spirit [4].

## 4. Conclusion

In recent years, China's motorcycle industry has developed vigorously and the market scale has been expanding, but the current design level of motorcycle still needs to be improved. For motorcycle enterprises, in order to condense the design elements of the brand property and shape competition, initiatives such as constant improvement of technology, industrial structure optimization, gestalt combination of visual identification under the principle guidance to improve the original design, and refinement of its own design features are needed.

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