A cover for the single-person pedal-powered vehicle

[redacted]

Single-person pedal-powered vehicle (usually called bicycle) has been an important way for transportation since one hundred years ago. This kind of vehicle enables people to commute more easily than before.

However, bicycle has several widely-acknowledged disadvantages, such as being unsafe and not rainproof. In the past few years, a lot of work has been done to improve its security and rain proofness. For example, Boyan Pu and Junhao Feng designed a basic model that simply added a special-shaped umbrella to the frame of the bicycle and increased the rigidity of it [1]. In addition, Chengyu Xiong created a new kind of bicycle that had a windscreen in the front, keeping the rain from the cycler but leaving his/her head wet [2]. More recently, a completely new idea invented by Bowen Li and Yitian Huang has been brought to researchers' eyes: to make bicycle have an enclosed space to prevent the cycler from the rain and provide a safer environment for the cycler [3].

Although these solutions bring upgrade to current kinds of bicycles, they do have limitations. Pu and Feng's design and Xiong's design increase air resistance while adding an umbrella or a windscreen, according to a wind tunnel experiment made by Fengjie Hong [4]. Moreover, Rongxi Sun's theoretical calculation has proved that Li and Huang's invention is overweight [5]. Therefore, it is necessary to keep a balance between making upgrade for the bicycle and losing its original conveniences.

In this paper, we first establish a new model of bicycle upgrading; in our model, the bicycle is produced semi-open with a large windscreen stretching from the front to the top (see figure 1). The shape of the windscreen follows aerodynamics, according to research of Qianqi Yang [6]. After that, we show some data that we got from our experiment and theoretical calculation, which is reliable and cheering.