**Introduction**

Bikes are commonly spotted in the world, being regarded not only as a way to exercise, but also a environmental-friendly way to commute. Therefore, more and more people begin to ride bicycles. However, bicycles are inconvenient to ride during bad weather, such as rain or snow.

A cover could protect the cyclist from exposure to bad weather. It seems easy that we could simply add a umbrella to the bicycle or wrap the bike with iron and glass. Similar researches were conducted by Alice[1] a few years ago. However, Bob’s study[2] pointed out that creating an iron body for the bicycle is unsafe, because the balance is much harder to keep so that the possibility of falling down increases dramatically. Carol carried out a project in 2019 pointing out the fact that a umbrella cannot effectively shield the rain for the rider[3]. Dave’s group used a synthesized material and applied it to creating the bicycle shell[4], and experiments conducted by Eve[5] showed that the new bicycle with the shell is much easier to keep balance, but the wind resistance is strong.

In this paper, we apply a new technique to create a cover with an aerodynamic shape, which can significantly decrease the wind resistance. In addition, we use a new polymer material tested by Francis[6] to build the cover, which is extremely light and hard. In our experiments, the results is promising, indicating that our bike with the shell is both protective and costumer-friendly.

The research gap is not discussed clearly. Only stated at the end of a long list. Also, it is not clear if most of the prior studies are relevant to the problem which this paper is going to addresss.