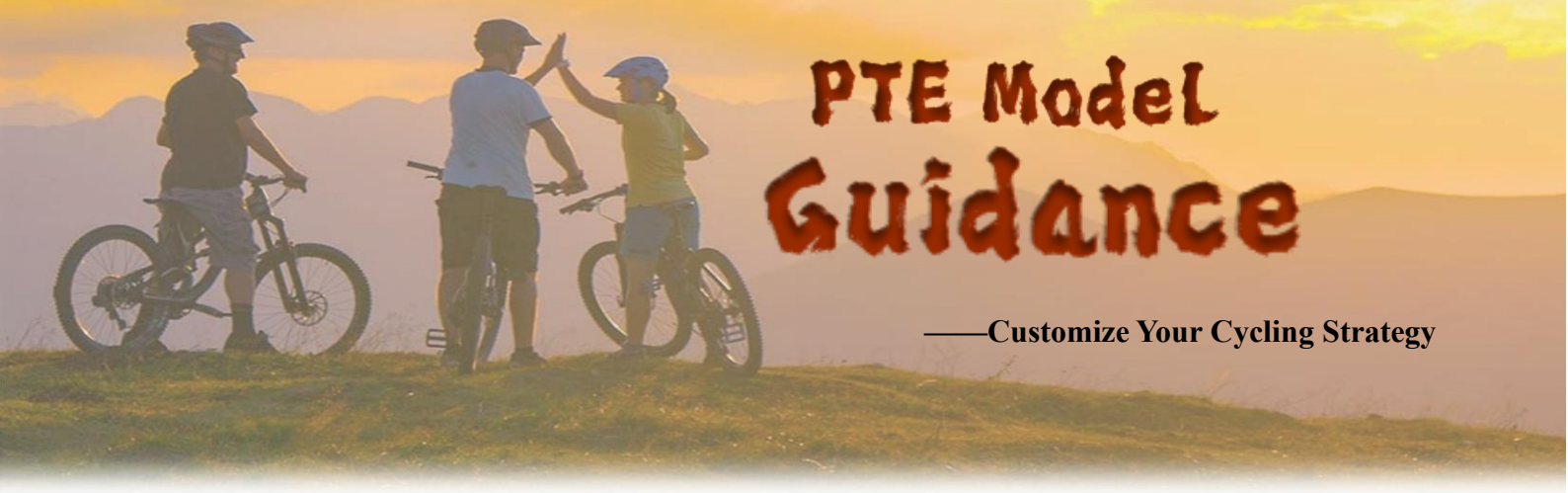

PTE Model Guidance

——Customize Your Cycling Strategy

Cyclists' power distribution counts a lot in a time trial. In this guidance, we will introduce our Power-Time-Energy (PTE) Model, which provides customized power distribution strategies to help you organize your training and competing, depending on your performance at different exercise intensities. If you are still struggling with the power distribution in the contest, please read on!

Our model is user-friendly: first, we need the data generated by the athlete's usual training, including the maximum time an athlete can sustain at different power output levels, of course, the more detailed the better. With the help of training data, we can plot the athlete's power curve, which indicates the rider's ability in different intensity domains. Then, we can generate a plan for power distribution during a specific competition if given the basic details of the track and weather condition, including course length, elevation gain, wind direction and speed, etc. The generated plan will show you how long you need to ride at what power, in order to get the best results.

In case this statement is too abstract, we will show the analysis process for a player in a competition.

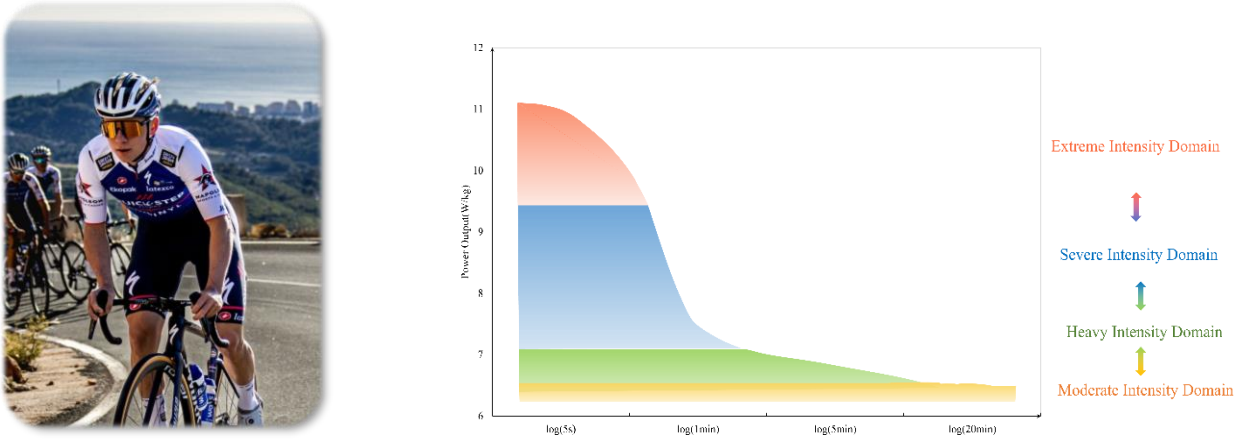

Figure: Remco Evenepoel and his power curve

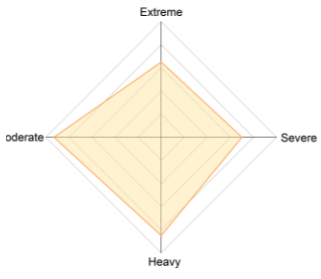

Figure: Radar map

Remco Evenepoel is a professional cyclist in Belgium, who ranked 3 in 2021 UCI World Championship Time Trial. Using his riding data from STRAVA, we plot his power curve and ability radar map as follows, which indicates his capacity at different exercise intensities.

As in shown in the radar map, he's very good at long rides, but

lacks in short sprints. This map can give suggestions to his daily training: he should increase his training for short sprints while maintaining the advantages of long rides.

Using his power curve, we give his optimal strategy on the UCI track as follows:

Our tactic is divided into three parts, which can be repeated for several times during a competition. Following the strategy above, Remco should exert his strength at level of FTP in the first 32:22(min), and recover for 4:59(min), controlling his average power output per weight at 6.14 W/kg. In the final sprint, he exerts all effort over the level of FTP, maintaining 6.80 power output per kilogram, and finally scores 48:14(min). Looking back on his game, he scored 48:34(min) in 2021 UCI World Championship Time Trial, which proves our model has a good performance in strategy optimization.

Also, you can see that there are several sharp turns in the UCI track, so you can flexibly arrange the recovery time in these bends to ensure the safety.

You may also be concerned about the effect of wind on game strategy. Our model also provides game strategies for different wind speed and direction conditions. Taking 2021 UCI WCTT as an example again, if wind speed and direction is put as parameters into our model, it can generate the optimal strategy under a certain weather condition.

	P_1	P_2	P_3	T_1	T_2	T_3	Total
No wind	FTP	6.14	6.80	32:22	4:59	10:53	48:14
Upwind	FTP	6.14	6.80	32:22	6:38	10:52	49:52
Downwind	FTP	6.14	6.82	32:22	4:15	10:32	47:09

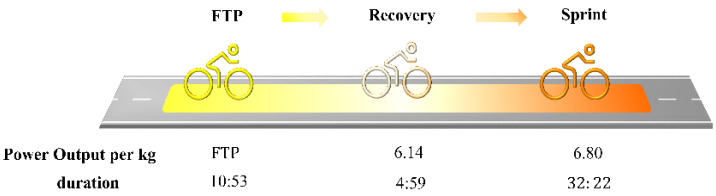

Figure: Strategy under various weather condition

As you can see in the table, we provide different scenarios for windy and non-windy conditions, considering wind direction.

With the assistance of our model, you can organize your training and competing better, helping your team to achieve the best results at the same riding level.

Action is better than hesitation. Let's start with your personalized power curve and competition strategy!