Distance
AKA, the "Donut of Danger"

Taekwondo has often been called a 'game of distance.' Indeed, a few extra inches can be the difference between a crushing blow and a complete miss. But how can your effective striking distance be measured, visualized, and extended?

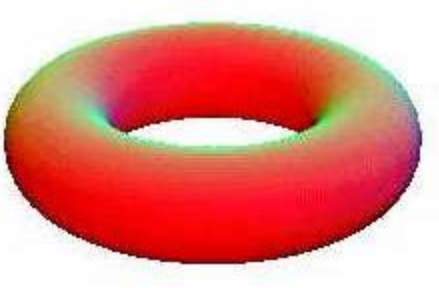


Figure 1. A Torus

A simple geometric approximation of striking distance can be formed by fixing one leg and rotating the other leg around the hip joint. The farthest point you will be able to hit will be at your hip level. If you raise your leg to hit higher, you will decrease your kicking distance. Thus, you will be able to hit your opponent from farther away if you hit to the height of your own hip. The shape that is made is called a torus, but commonly referred to as a donut.

We will simplify the analysis to two dimensions and take a bird's eye view from the top, looking down on the two competitors. Figure 2 shows each competitor and his optimal striking distance. The edges of the circle should be fuzzy, in that a competitor is not able to deliver maximum power at the extreme edge of his range. The inside dots represent the body of the competitor, i.e, if any part of the blue circle touches the red dot, then the blue player is able to score on the red player. In figure 2, the competitors are at an *idle distance* in that neither can strike the other. Note that the blue player is taller and thus has a longer range (bigger circle) but that the red player is better able to strike on the inside (smaller inner circle).

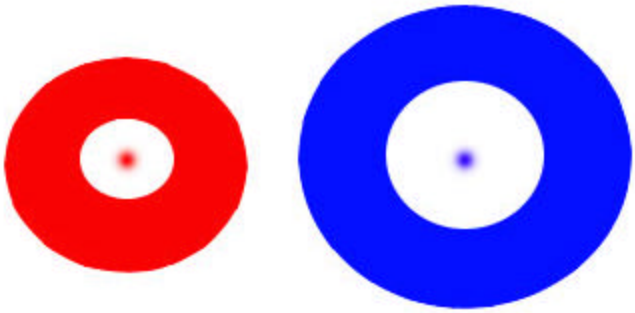


Figure 2. Both players at an *idle distance*

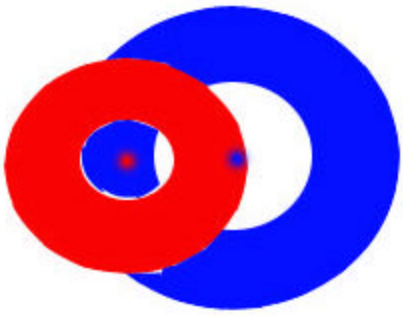
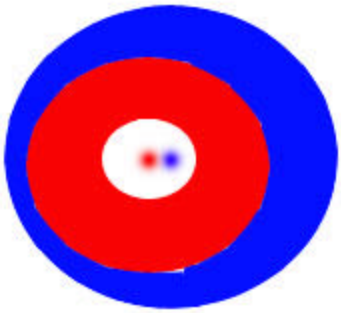


Figure 3. *Flurry distance*, where both players are capable of hitting each other

What commonly happens in a sparring match is that both players go to a distance where they can comfortably strike the opposing player, which is usually the *flurry distance*, where both players can strike each other well. In this situation the player who is faster will be able to score more points, although he will have to take significant punishment if the other player is stronger. If one player is faster *and* stronger, then he will be successful as long as he does not stay in his opponent's *optimal distance*.



It should be obvious that there are two ways to avoid an opponent's kick, moving back and moving in. The white area in the figures is the area where neither player can attack. Often one player will close the distance and end up in a neutral *clinch* position. Clinching can be a useful strategy to disrupt an opponent who is faster or to waste time.

Figure 4. The *clinch* position. The players' chests are touching and neither player can strike the other.

In order to have an advantage, one player must keep the match in his *optimal distance*. This distance varies depending on who has a longer range.

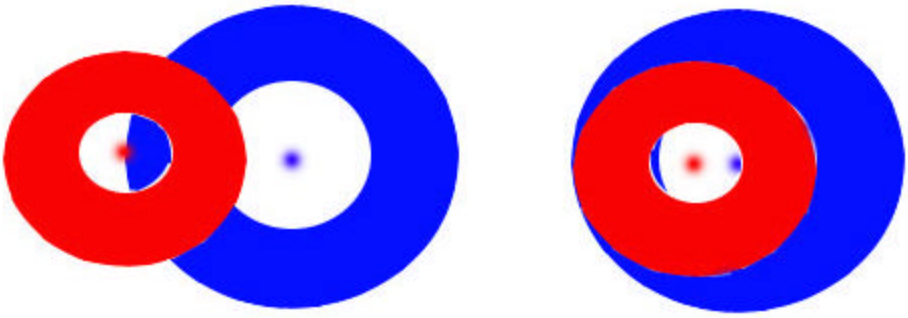


Figure 5. Optimal Distance. The optimal distance is different for the taller blue (left) and the shorter red (right)

As long as there is a difference in range, there is a point where you will be able to strike your opponent and he cannot strike you. This is usually at the outside or inside edge of

your range. For example, in the left part of figure 4, the blue player positions himself at the outside edge of his range and is able to strike the red player, while the red player is too far away to strike him back. In the right half, the red player goes inside and is able to strike the blue player, while the blue player is too close to strike the red player effectively.

This leads should lead each competitor to ask 2 fundamental questions:

1. **How can I extend my 'donut of danger'?** – You must extend your effective striking distance both inwards and outwards. The only way to do this is to practice striking targets closer and closer or farther and farther. The kicks change as the distance changes. Crescent kicks are good in the inside, and roundhouse kicks are good to extend distance. Also, the torus was drawn with the hip at a fixed point in space. By moving your hip you can shift your entire torus in that direction. For instance, to hit in a clinch, fold your hips back and you will be able to strike closer to your body.

2. **How can I keep the match at my optimal distance?** The simple answer is that you must have excellent footwork. You must be able to quickly get to the desired position and from there counter your opponent's movements. For example, if you are at your optimal distance and your opponent moves forward, you must move back to keep the distance the same. You must also be able to move laterally and diagonally to cut off distance quickly. The player with the longer range naturally has an advantage because the shorter player will reach his striking distance before he will reach the shorter player's striking distance.

Advanced concepts:

Deceptive Range- None of the concepts discussed here are secret, and the strategies are obvious. However, the edges of the donut of danger are different for each player. If you can achieve a longer range than your opponent suspects you may be able to inch into your *optimal distance* while your opponent still believes that you are both in an *idle position*. From there you will be able to strike and surprise him.

Drawing Out Kicks- You will have momentary safety immediately following a kick by your opponent. This is the best time for a shorter player (red) to enter the donut of danger of a larger player (blue). Red can inch into blue's optimal distance and cause blue to strike. Red then slides back and avoids the kick, and then rushes in to strike and take the match to red's optimal distance.

Extending Range with Steps- Although each time a player steps the donuts shift position, if a player steps and strikes immediately, he may be able to extend his range. This holds true for kicks like hop, back leg roundhouse kicks and double kicks.

Letting the Opponent Close Distance- Often it is to the shorter player's advantage to let the tall player close the distance and then counter him. This can negate the taller player's range advantage. This is why back kick is especially necessary for shorter players as they cannot match roundhouse kicks off the line with taller players. Since the taller player is already coming in, the shorter player can use his back kick and score without having to worry about the distance advantage of the taller player. However, when using a back kick, the shorter player is vulnerable to being faked out by the taller player and countered when he completes his spin.

However, it is important to remember that the player with the shorter range may be able to close the distance, kick, and clinch if he is significantly faster that the taller player. This will work only if the taller player is not good at the *pada chagie*, or receiving kick. If the taller player slides backwards while throwing this kick, he will prevent the shorter player from closing enough distance.