In the moon kingdom bowser fight, the majority of the fight is un-optimizable, just waiting for Bowser to throw out his hat. The only places where timesave is possible is as follows.
- Movement to bowser during 1st phase
- Hits before 1st phase tail swipe
- Hits after 1st phase tail swipe
- Grabbing the hat during 2nd phase
- Hits before 2nd phase tail swipe
- Hits after 2nd phase tail swipe
- Grabbing the hat during 3rd phase
- Hits before 3rd phase 1st tail swipe
- Hits before 3rd phase 2nd tail swipe
- Hits after 3rd phase 2nd tail swipe
- K.O. Cutscene skip

The limit for punching is one punch every 8 frames, so the following areas are trivial to optimize.
- Hits before 1st phase tail swipe
- Hits before 2nd phase tail swipe
- Hits before 3rd phase 1st tail swipe

There are also some areas that are very similar to each other and don't need to be individually explained, so the following will be grouped together.
- Hits after 1st phase tail swipe
- Hits after 2nd phase tail swipe
- Hits after 3rd phase 1st tail swipe
- Hits after 3rd phase 2nd tail swipe

- Grabbing the hat during 2nd phase
- Grabbing the hat during 3rd phase

I will explain the rest of the areas of optimization in detail.

Movement to bowser during 1st phase
This is by far the place with the single most time save over BTT in the fight. The TAS saves 19 frames in this section. This is mainly because of three reasons. The first is that BTT does a triple jump to keep momentum after hitting the hat, which caps horizontal speed to 24 units/frame, while TAS does a roll after hitting the hat, which has a small speed decay, but the decay isn't enough to get the horizontal speed below 24 units/frame by the time mario grabs the hat. The second reason why there is so much time save in this section is that BTT does a dive after getting the hat, while TAS does a spinpound roll. Spinpound rolls have a horizontal speed of 30 units/frame while dives only have a horizontal speed of 20 units/frame. The third reason is the lines mario takes to get to bowser. BTT goes out to the left and then back to bowser, while TAS goes almost straight forward. TAS is unable to exactly go straight forward because then Cappy will not home into the hat. TAS also minimizes the time between hitting the hat and getting the hat, as that is when mario is moving the slowest. TAS also grabs the hat early, so that by the time mario reaches bowser, he has started to jump away. This allows the TAS to make bowser land on the same bump he started on after the last hit.

Hits after tail swipes
During the tail swipes, Bowser is invincible. Because of that, it is optimal to do the first hit on the frame that he becomes vulnerable. It is also optimal to do this first hit on the last frame that a punch is active, because that way the next punch can start faster. This means that in order to be optimal, you must have a punch go active 8 frames before bowser becomes vulnerable, and also have a precise amount of momentum such that the punch hitbox moves into Bowser's hurtbox on the frame that bowser becomes vulnerable. The next punches aren't really optimizable because they just have to happen a set amount of frames apart from each other, but the last punch is optimizable. It is optimal to hit Bowser on the first frame that the last punch becomes active, but the first frame that the last punch is active is when the hitbox is right next to mario, so you have to be really close to bowser to hit him on this frame. There is also timesave in the angle that you perform the last hit from. This angle determines how Bowser will be sent flying after you hit him. Bowser travels faster before he hits the wall than after he bounces off of it, so it is optimal to make him hit the wall as close to the landing bump as possible.

Grabbing the hat
It is optimal to grab the hat as early as possible, as that determines when your first punch can be performed. To do this, you must throw Cappy at the hat on the first frame that the hat is able to be hit and then grab the hat immediately. To do this, the TAS does a triple jump towards the hat, and waits to throw Cappy until the frame that the hat is able to be hit. By waiting to throw Cappy, any other hats that get hit at the same time as the white hat will not cause lag. The TAS makes sure that it is as low as possible when Cappy hits the hat, because that way mario will instantly grab the hat without having to wait for the hat to move up into mario.

K.O. Cutscene skip
This cutscene skip is just like any other, plus, wait 8 frames, plus, wait 22 frames, and then a. Despite the simplicity, the TAS saves 5 frames to BTT here by performing each action on the first possible frame.