

# The Movement Analysis of a Jump Float Volleyball Serve

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## Introduction

According to Andrea Ciuffarella, Luca Russo, Francesco Masedu, Marco Valenti, Riccardo Marco De Angelis the main goals of serving are: to score an ace or to make the opposing team's receiving and attack more difficult, compatibly to the skills of the opponents. A jump float volleyball serve is characterized by a low trajectory toss, late in the service approach, and a submaximal jump according to Sasho MacKenzie, Kyle Kortegaard, Marc LeVangie, and Brett Barro. According to Jonathan Reeser, Glenn Fleisig, and Becky Bolt the jump float volleyball serve can be broken down into the approach, takeoff, arm cocking, arm acceleration, and follow-through.

Approach

Takeoff

Arm Cocking

Arm Acceleration

Follow-Through

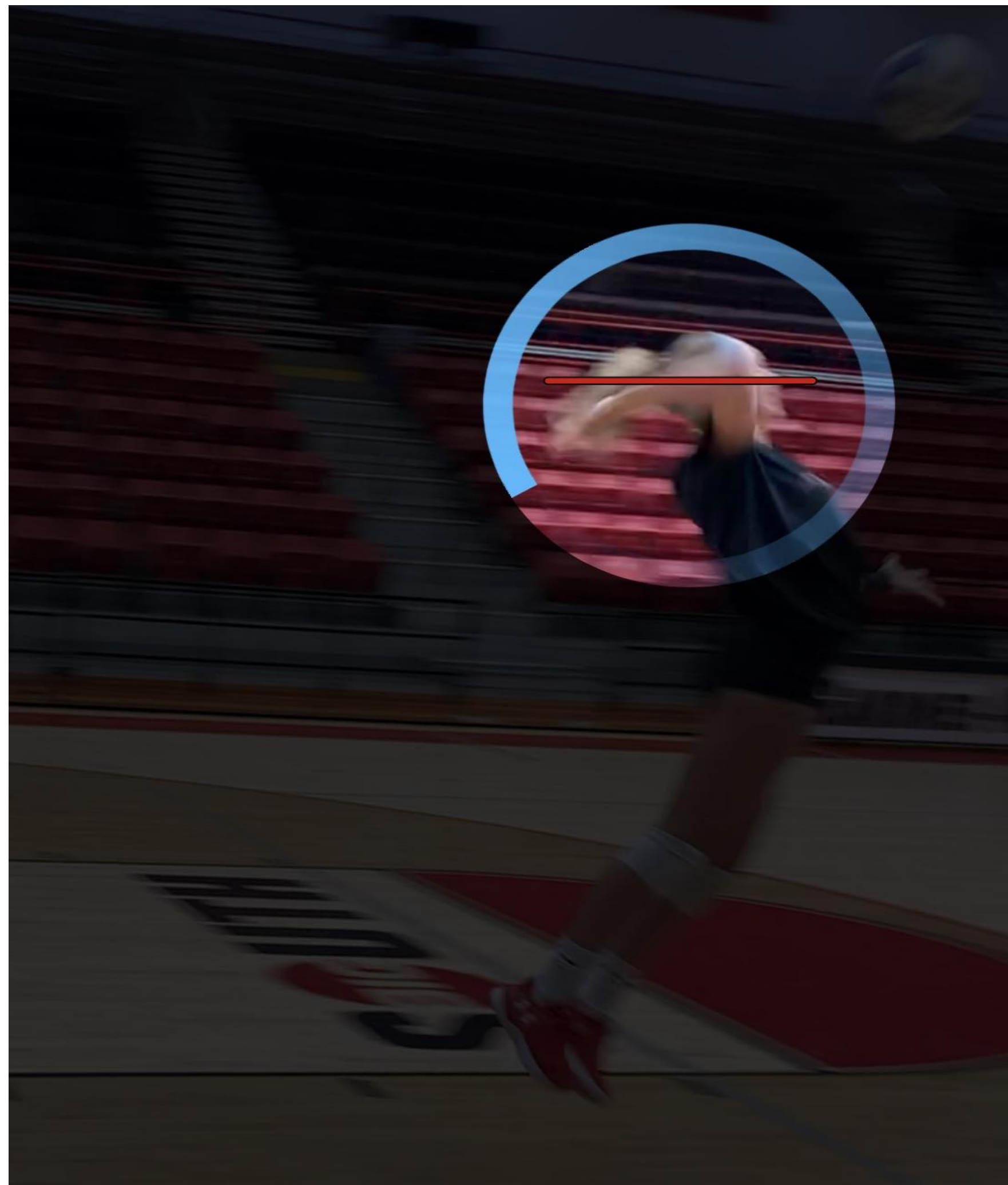
The approach phase consists of three steps and a toss. It begins with a large left step, followed by two quick steps (right then left). The first left step engages the leg as a stabilizer, causing quick shifts between the eccentric and concentric muscle groups of the quadriceps and the hamstrings. The leg should be partially bent, engaging the core for stability and the eccentric qualities of the hamstrings for power. Core stiffness allows for the stabilizer to be more effective. The stabilizer can generate the force and power from the core and channel that energy into the ground. This allows for the athlete to travel further distance between the first left step and the two following steps. The next two steps occur quickly. Core engagement allows for the pelvis to turn outwardly with both legs planting underneath. This phase may look similar to that of the athletic position. The knees are bent, shoulders are back, arms draw backwards, and the athlete prepares to jump.



The takeoff phase occurs when the athlete channels the energy created from the approach into the floor in order jump. The primary arm stays bent behind the head of the athlete, while the non-dominant arm remains stretched out in front. At this point the ball should be reaching its peak in the air. The athlete is in a squat position, stretching the sarcomeres of the quadriceps. when the athlete jumps, she transfers the force created from core activation through the distal regions of the body. She pushes off the ground with both legs, enhancing the concentric abilities of the quadriceps through the stretch response and the eccentric qualities of the hamstrings. During the serve, the athlete wants only a submaximal jump. As a result, the athlete has to consciously control how much force she is generating. By the end of this phase, the athlete should be completely in the air with the same arm position as described previously.



In the arm cocking phase the dominant arm shifts from external rotation to internal rotation. The athlete is still in the air and should be approaching the height of her jump. The athlete still does not contact the ball, however, this puts the arm and shoulder in a good position to do so. The elbow must stay about eye level. If it drops below this position, this places the hand in a poor position, causing the athlete to contact the bottom of the ball rather than the middle. If the elbow is too high, the elbow becomes too extended. As a result, the core is not engaged and the arm cannot generate enough power. As the arm becomes more extended, the individual has less control over their arm. It is important when the arm shifts from external to internal rotation that the scapula moves first. If not, it could cause damage to some of the tendons and ligaments in the shoulder region.



During the arm acceleration phase the individual externally rotates the shoulder, extending the dominant arm to make contact with the ball. At this point, the athlete should reach the maximum height of her jump, along with maximum extension of her arm. As the athlete contacts the ball, she engages her core. Her core allows her to pull in her left, non-dominant arm, transversely twisting the pelvis anteriorly. This proximal stiffness of the core allows for distal strength and mobility. The core also allows for the athlete to increase the velocity of her right swinging arm as the left arm drops. The right hand should be open and flat when contacting the center of the ball. The wrist should not bend much during contact. These two components allow for the ball to float.



The last phase is the follow-through, specifically of the the right arm after contact with the ball is made. The athlete should land on both feet and face the net as she completes her follow-through. The follow through phase occurs after the athlete contacts the ball. If the follow-through occurred simultaneously with ball contact, this would cause the ball to spin. The follow-through returns the arm back to its normal position. The scapular rotation aids in this step. In the above picture the athlete lands on one foot. This places too much pressure on the tibia and fibula. If too much repetition of this motion occurs, the athlete could eventually develop a fracture or other issues.



## Conclusion

In conclusion, the five stages of a jump float volleyball serve occur rapidly and often can be confused if not broken down frame-by-frame. The rapid flexion and extension of the legs allows the athlete to transmit the power generated from the core into the ground. As her arms are elevated they switch from external, internal, and lastly external rotation during the serve. The contact point should be high with a flat hand contact in the center of the ball. Follow-through should occur after contact, returning the body to a normal position.

## References

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