**Title: Sports Biomechanics at SINES**

In cricket, bowling wins tournaments and we have best fast bowling attack; the duo of mighty Shaheen Shah Afridi and whitey Naseem Shah (according to Urvashi) can take out any wicket in early overs. With their fast bowling, fierce pace, swings, and tactics they help Pakistan in every match. But Naseem Shah had been ruled out of WorldCup 2023 (Yeah sadly) because of an injury while playing in an intense cricket match against India in September, which also got us the AsiaCup. What if you have a magic wand of Dumbledore from Harry Potter and do some Aveda Kadavra or revealing charm to know the cause of injury and with the help of Dr Strange you could prevent the injury from even happening. Will you take it? Will you be willing to help Pakistan win every competition?

“I WILL DO!”

And That’s where my PhD comes in, saying one of reasons for the injury is “His own fast bowling action”. Wait a minute, “NOT all bowlers have such injuries???”.... NO! Because NOT all bowlers have the same style. Every style gives a unique load to the body of the player. In fast bowling, the combination of fast runup, jumping, bending, throwing the ball with certain high speed along with excessive bowling with little rest becomes the load to the human body. Also, every person has different body structure.

I am using the high-speed cameras to capture the bowling styles of club level bowlers. Every frame of the videos captured presents the orientation of the bowler in 3D space. The coordinates of each segment with respect to time and respective accelerations are used to convert every bowling style into corresponding bowling load i.e., forces and torques. These loads are then applied on my own developed finite element model of the spine. Remember, the spine of a human body is a complex structure therefore making its CAD model and then finite element model becomes cumbersome. However, image processing techniques are used to develop the required model. Compensation for the variety of spine structures of the Pakistani bowlers is upheld in these models.

Effects of these loads on the spine are analyzed and risk for spine fracture is assessed. However, working with different styles and structures requires smart work which involves artificial intelligence. My aim is to give corrective actions (such as modifications in the bowling styles, guidelines for coaches) to reduce the likelihood of injuries like Nassem Shah is having. So that, NOT another Naseem Shah to be left out of any WorldCup. And we win every competition.