

# It's not just cricket – actually it's physics

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Ever wanted to face a Shane Warne spin delivery or smash a Glen McGrath speed bowl? A new bowling simulator may enable you to do just that. The machine is the first of its kind to use physics, real cricket balls and novel speed and spin generating mechanisms to imitate realistic deliveries (e.g. spin, swing and pace) as generated by professional cricket players. Dr Andy West, the machine's inventor at Loughborough University described it at an Institute of Physics conference, Physics and Engineering – Synergy for Success, yesterday.

Dr West said: “By considering the physics of air flow around a ball and launch conditions we have made a robotic bowler that we can programme to mimic Warne, McGrath or the style of any other bowler. When we were designing the machine, we considered all the things that real players use, such as the orientation of the seam and the speed at which the ball is released to vary how a ball travels when it is bowled.”

“Real life bowlers can get tired or injured during extensive training periods so the machine is ideal for batsmen to practise with. The team coach can programme it to bowl whatever sequences of deliveries he wants. Alternatively, exactly the same ball can be bowled again and again (referred to as shot grooving) until cricketers become expert at hitting them.”

The trajectory of the ball from the bowling machine to the batsman is dependent on how the boundary air, the air next to the ball, moves around it and how it separates or moves away from the ball. There are two different types of air flow – laminar, which is smooth - and

turbulent, which is rough. In laminar flow the boundary layer separates approximately halfway around the ball whereas in turbulent flow the separation is later.

The seam on a cricket ball “trips” the air flow into turbulence so there is rough air flow on one side of the ball and smooth air flow on the other. This creates an uneven air flow around the whole ball which causes a sideways drift. The size of the drift depends on the angle of the seam, the speed of the ball and the condition of the original air flow around the ball. It is essential therefore that the seam is aligned accurately to enable any machine to be able to generate this type of “swing” delivery.

Dr West continued: “Consideration of the physics of flight and the requirements of players and coaches has enabled us to make a very realistic bowling machine that will be great for professional cricketers to practise with. However our vision is that the machine is not just for the professional. The cricket emulator is part of a co-ordinated suite of sports simulation machines that have been or are currently under development at Loughborough covering sports such as golf, football, cycling, rowing and weight training.”

Source: Institute of Physics

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