

# National University of Science and Technology

Faculty of Industrial Technology

Department of Electronic Engineering

*Design of WIBASE (Wearable Instantaneous Ball Speed Estimator)  
for cricket bowlers.*

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## *Abstract*

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This research was undertaken because there is no equipment for measuring the speed of cricket bowlers during training in order to improve their performance in Zimbabwe. The Radar guns that are being used in cricket to measure the speed of bowling are only available in Zimbabwe when there are international matches and they are hired together with broadcast equipment at a cost of around US\$10000.00 per day. It therefore follows that the speed guns are not available during training sessions and the cost of hiring appears exorbitant. While there is no equipment for measuring the speed of a cricket bowler during training, the assessment criteria of cricket bowlers during training sessions includes but is not limited to determining firstly, the ability of the bowlers to bowl at a consistent speed during long bowling spells and secondly to ensuring that maximum bowling speeds are achieved which requires the measurement of speed of bowling. Unlike their Zimbabwean counterparts, Cricket South Africa has a High-Performance Centre (HPC) at the University of Pretoria which is equipped with speed measuring and other performance enhancing equipment.

The aim of the research was to develop a system that can be utilized by cricket bowlers to measure their bowling speeds. The Wearable Instantaneous Ball Speed Estimator (WIBASE) was the system that resulted from this research. The WIBASE was made up of two hardware elements; a wrist worn electronic board that houses among other components, accelerometers and a laptop computer. The electronic board tracked the acceleration generated by the movement of the arm when delivering the ball and stored these values. The sensor data was processed by a Digital Motion Processor and sent via Bluetooth to the computer. The computer ran a program that received the acceleration data and processed the data to derive the speed of the cricket bowler. The acceleration was integrated numerically over a minute period of time around the release point to get the speed using the Trapezoidal method of integrating data.

The aim of this research was achieved with positive results. The results obtained from the three sets of experiments show that the WIBASE can track the 3D acceleration of the hand when bowling, derive the speed of the bowlers and display the speed on a Pygame window. The client program logged the various information in the output window of the Integrated Development Environment (IDE).

A training aid for fast cricket bowlers was developed and tested. Overall, this system can help cricket bowlers and coaches to measure the bowling speed during training in order to enhance performance and monitor the consistency of the bowlers over long bowling spells.