

Gliding to gold -- world-beating software could boost British swimming

New computer software could enable Britain's swimmers to improve a key aspect of their technique more quickly and effectively than previously possible – and so help them win more medals in major championships in future.

The software provides instant, in-depth feedback on a swimmer's glide technique. Swimmers glide following starts and turns, when a swimmer is not moving their arms or legs but is just using their momentum to travel through the water. As well as supplying data on head position, body posture/alignment etc, the software actively suggests ways a swimmer can improve their posture to minimise resistance and pinpoints the optimum moment to begin kicking.

The new system offers two key benefits beyond the capabilities of any other currently used in elite swimming training. First, the feedback it generates is available immediately, so swimmers and coaches can use it at the poolside and implement its recommendations while a training session is still in progress; this will speed up the whole process involved in improving glide technique. Second, it generates data of unprecedented quality in terms of detail and accuracy.

Ultimately, the result will be faster times in races. Gliding more efficiently, with less 'drag', can cut vital fractions of a second from a swimmer's time. The difference between winning an Olympic title and finishing out of the medals is often measured in hundredths of a second, so this innovative software could give British swimmers a valuable edge in their quest for glory.

The software is being developed by sports scientists at the University of Edinburgh's Centre for Aquatics Research and Education (CARE) with additional input from Sheffield Hallam University, and funding from the Engineering and Physical Sciences Research Council (EPSRC) in collaboration with UKSPORT. Once tested and validated, it should be available to swimmers throughout the UK within around 12 months.

First, the swimmer is marked at their body joints using water-resistant markers. The swimmer is then videoed in action using underwater and poolside cameras, with the images fed into a computer equipped with the software. The software tracks the movements of the markers and runs the digitised position data through an innovative, highly sophisticated mathematical model developed at the University of Edinburgh by Dr Roozbeh Naemi. A replay of the swim then instantly appears on a plasma screen at the poolside, overwritten with graphs and data on different technical aspects of the glide.

“Both the speed and accuracy of the feedback will add to the value of the advice that coaches give their swimmers,” says Professor Ross Sanders, who is leading the project. “Another important benefit is that the alterations to technique suggested by the software are customised exactly to suit each individual swimmer.”

Swimmers from the prestigious City of Edinburgh and Warrender swimming clubs will participate in testing the new system and then in experiments to learn more about the factors relating to gliding performance.

“The software could even help to identify the champions of tomorrow,” Professor Sanders adds. “It will show which young swimmers naturally move easily through the water, which may well equate to outstanding ability or a particular aptitude for the sport.”

Source: Engineering and Physical Sciences Research Council

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