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Computer cast?

Want to improve your casting ability? Well you could try hooking yourself up to a computer for an objective analysis of your technique. Science writer **John Bonner** reports on the latest nugget of casting wisdom to find its way across the Atlantic.



ARE you one of the thousands of fly fishers whose casting range is stuck in the 25-yard zone? Do you want to reach the psychologically important 30-yard mark?

You could look up your nearest casting instructor and book a couple of sessions at his next casting clinic in a bid to sort out your bad habits.

But what if you could simply hook yourself up to a computer, which then analyses your casting action and delivers a completely objective verdict on exactly where you're going wrong?

Well, that's precisely what mechanical engineer and keen flyfisher Noel Perkins has come up with. Noel spends his working day trying to figure out how to catch much bigger 'fish' than trout.

In his day job, Noel is professor of mechanical engineering at the University of Michigan, where he conducts research for the US Navy into the effects of wave and current action on huge underwater cables loaded with sensors that are used to detect enemy submarines.

Noel took up fly fishing five years ago and soon realised that the simulation technology used for detecting enemy submarines could be applied to understanding what makes a good fly caster.

"Apart from the scale, there is not much difference in the dynamics of an underwater cable and a fly line. Sure, one is much longer and thicker than the other and the medium they are in is different - salt water rather than air, but their behaviour is pretty similar," he explains.

"So we developed the hardware to examine the basic elements of the cast and work out the differences in the way the rod moves with anglers of

different levels of skill, from beginners to experts."

Noel showed his prototype 'fly casting analyser' to Bruce Richards, the renowned casting instructor and product engineer for Scientific Anglers (3M) in Midland, Michigan, who immediately saw the potential of the technology in teaching anglers to cast a better line and encouraged Noel to continue his work.

He went on to produce a second prototype that uses a micro-electromechanical systems (MEMS) sensor attached to the butt end of the fly rod which records the movement of the rod throughout the cast and transfers it to a simple hand held computer. The computer produces a graphical readout that highlights the differences between novices' and experts' casting styles.

Unlike the erratic 'casting signature' of a beginner (see **diagrams right**), that of an expert is remarkably symmetrical, exhibiting similar changes in angular velocity over time during the back cast and forward cast. But the main distinction between the two is in the crispness of the 'stop' at the end of the back cast. The beginner's back cast ends with a distinct wobble, while the expert's is a clearly defined halt.

The graphs also highlight flaws in the technique of intermediate casters like Noel, which limit the length of his cast. They clearly show that he commits the common error of rod creep - as he finishes his back cast, the rod rotates slowly forward. This reduces the arc available for the forward cast and, to compensate, he puts too much force into the forward stroke, forcing the two sides of the loop to cross and form a 'tailing loop', which can tangle the line



Noel uses a Palm hand-held computer to monitor his casting action with a micro-electromechanical sensor linked up to the butt of the rod.

and leader, causing wind knots.

Before subjecting his technique to computer analysis, tailing loops started to form when Noel cast about 40 ft of line, but having modified his technique he now reaches 60 ft before these problems start to develop.

Noel and Bruce are developing computer software that will automatically break down the mathematical complexities of the data into a series of simple instructions or teaching points.

Noel hopes to develop it commercially for individual fly fishermen who want to cast better or for instructors.

Another possible application is in tackle shops to help anglers select rods and lines that suit their individual casting style.

Casting experts seem a little sceptical about the usefulness of Noel's findings.

Tournament caster and operations manager at Fulling Mill Sam Davis said: "If I was a casting instructor, I wouldn't be heading for the dole queue yet! Noel's fly casting analyser falls short of highlighting anything ground-breaking in

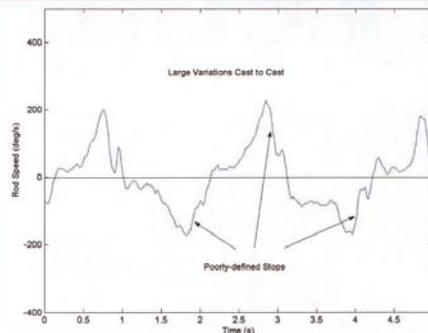
casting assessment which would render the casting instructor obsolete. Casting faults such as un-crisp forward and back stops, wobbly casting arcs, and rod creep are visual faults which can be rectified with proper human tuition and practice.

"However, this technology could be helpful (as a cast-for-cast comparison tool) for experienced casters who don't have access to a second pair of 'casting eyes' every time they practice.

This analyser may help to iron out 'distance-killing' excess casting vibrations/movements which otherwise could not be detected by the human eye."

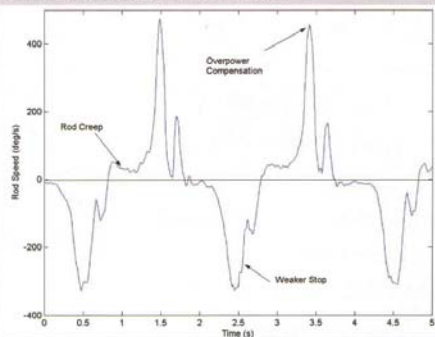
Casting instructor and Sportfish Team England manager Simon Gawesworth said: "I know a few Americans will get on board with this type of thing but cannot imagine anyone who is a good casting instructor buying a computer to show the readout of the finished cast - that still won't tell anyone how to make the cast better, nor instill the correct muscle memory!"

CASTING SIGNATURES



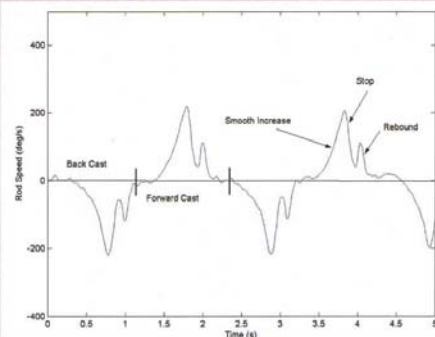
THE BEGINNER

The beginner's cast is erratic when compared to the expert's clearly defined signature below. It is characterised by poorly defined stops and evidence of 'rod creep' after the stops.



THE INTERMEDIATE

A better defined casting rhythm in this trace, with a more consistent pattern, but the stops are not as crisp as the expert and there are signs of overcompensation on the forward cast.



THE EXPERT

The whole action is much smoother, generating a consistent trace which shows very clearly defined stops, and no signs of overcompensation on the forward stroke to make up for the erosion of the casting arc caused by rod creep.