Physicist Developed Sonic Golf Training Tool

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Robert D. Grober, Yale professor of Applied Physics and Physics, has combined his passion for golf and his professional expertise to produce a unique and effective real–time audio biofeedback device for teaching and training golf.
Grober developed a golf club that has motion–detecting sensors, similar to those used for safety air–bag deployment in cars, embedded in the shaft. Sonic Golf's unique feature is the use of real–time audio feedback. "We were able to identify a signal from the sensors related to the speed of the club," Grober said. "We convert this signal into an audio soundscape that is universally intuitive to golfers and instantly interpretable, providing real–time audio feedback on the tempo, timing and rhythm of the golf swing."

A patent was filed through the Yale Office of Cooperative Research and the technology is licensed to his company, Sonic Golf, LLC. He has successfully tested his clubs with leading PGA teaching professionals in Pinehurst, Southern California, Maui, and Florida.

"From listening to Sonic Golf's audio feedback, all the students made improvements in their swings in just 20 to 30 minutes," said Bill Greenleaf, a PGA Master Professional and Director of Instruction at the Dunes at Maui Lunai. "Some fine tuned, and some made dramatic changes that I would not previously have thought possible. Eight weeks later, the effect is still contributing to their improved play."

The clubs have a wireless data link both to headphones and to a computer. As the golfer swings, an audio soundscape is generated for the

golfer that represents the speed of the club—a soft, low pitch when the club is moving slowly, scaling to a loud, high pitch when the club is moving quickly. Data is also collected by a computer allows further analysis of elements of the swing, including the duration of the backswing and downswing, the force of the release, and the swing–to–swing reproducibility.

This is a completely new way to develop tempo, rhythm, and “feel” and to train muscle memory in the golf swing. Additionally, it provides a mechanism to effectively connect the golfer and instructor, allowing them to explore the sound and data together and to make swing changes by altering the soundscape.

“This is a great example of the joy in practical application of basic science and engineering.” said Paul Fleury, Dean of the Engineering Faculty and Frederick W. Beinecke Professor of Engineering at Yale.

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