

Bluetooth-enabled bicycle has automatic gearbox

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(Phys.org)—Oh, no. Not another reason to count your smartphone blessings? To feel so lucky to have a phone loaded with accelerometer and GPS? Oh, yes. Engineers at UK-based [Cambridge Consultants](#) have developed electronic automatic gear shifting for bikes, in a system that relies on smartphones. The company has been working on a wireless automatic gearbox that does the gear-changing, not the rider. The system is controlled by an app on a handlebar-mounted iPhone. Also part of the system is a Shimano Di2 electronic gear-shifting system for road bicycles, wheel rotation sensors that reveal road speed, and a pedaling (cadence) sensor. This prototype is not yet in the shops, and has no estimated pricetag, but its creators would be interested in business partners.

In such an electronic gear-shifting system, the idea is for the rider to shift with electronic switches rather than manual control levers. An advantage to an [electronic system](#) is that it enables fast gear-switching. The system is Bluetooth-enabled so that in manual mode the bike can "talk" to the [iPhone](#), which can analyze cycling performance. When in automatic mode, a main crank's [magnetic sensor](#) relays how fast you are pedaling (cadence) to the phone app and the wheel sensor tells it your road speed. The correct gear is computed and beamed to the Shimano mechanism. That is how the phone is put to use to calculate the best gear to be in for the rider's pedaling speed, and then shifts up or down. The phone's [accelerometer](#) can tell when to change down in an emergency stop and the phone's GPS can be used to get the bike into the correct gear for an upcoming incline.

The system was developed by Mark Wilson and his team at Cambridge Consultants. He said the company's tester told them that he never feels like he is in the wrong gear.

According to [New Scientist](#), you can find mechanical automatic gear boxes, but there is a disadvantage of wearing out quickly, as they are based on moving flywheels. The engineers' wireless method activates an electric gearshift that has no such issues. The report also noted that electric gear shifts made by firms such as Shimano are normally connected by cable to a lithium battery and gear switches on the handlebars.

Addressing the question about interference compromising a gear change, a Cambridge Consultants team member said in Gizmag, "The frequency hopping mechanism of the [Bluetooth](#) radio also ensures that many hundreds of cyclists could operate within a very small space without interference compromising the gear change."

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