Georgia Institute of Technology

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Georgia Tech Students Design Innovative Cell Phone To Reduce Risk of Using Phones While Driving

ATLANTA (August 12, 2002) -- More wireless products than ever coming to market today include new features that help reduce the risk of using phones while driving. Since the introduction of cellular phones in 1983, the technology has evolved dramatically: from heavy, cumbersome and expensive devices to relatively cheap, easily-portable mini devices.

At any given time, about 3 percent of those driving passenger vehicles on American roadways about 500,000 drivers are talking on hand-held cell phones, according to a survey last year by the U.S. Department of Transportation's National Highway Traffic Safety Administration.

Mechanical Engineering Student Anish Buch holds a prototype of a phone he and a classmate designed that flips open at the press of a button, making it an easier and safer phone to use while driving.

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Statistics like this caught the attention of Georgia Institute of Technology students Anish Buch and Neil Saunders, both seniors in the George W. Woodruff School of Mechanical Engineering. The two were enrolled this past spring in a design course called Interactive Computer Graphics and Computer-Aided Design in the Woodruff School. The course requires students to pair up and design a new product of their choice. Their result: a prototype of a small cell phone that flips open at the press of a button, making it easier and safer to use while driving, the two say.

"This design, in general, is a lot more durable and smaller than most flip-phones available out there," said Buch, 21, a senior in mechanical engineering. "However, what is really innovative about it is that it allows for single-handed operation, which increases comfort and ease of operation as

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well as safety while performing tasks, such as driving, that require undivided attention."

Designing a New Concept

Buch and Saunders followed design guidelines specified in a contest they learned was being sponsored by PTC and Motorola, called the PTC/Motorola Flip for Design competition. They figured they'd design the phone for class as well as enter it in the competition. Before they began designing the phone, the students researched the flip-phone products that are already on the market. They found most of the products to be cumbersome when it came to operation.

So they designed a phone that worked they way they wanted it to work. The phone is divided into two halves and joined by a hinge. Magnets on each half keep it closed. The notable flip-feature of the design uses a hinge-and-trigger system to spring open the phone. By pressing a trigger button in the area where the user grips the phone, two solenoids on the bottom face rise, pushing the upper half out just enough for the springs to overcome the magnetic force and bring the phone to the open position.

At the onset of the project, the two students went back and forth over what to design. They were required to design a cell phone or similar communication device with an innovative hinge-and-trigger system and one that had the ability to maintain its durability and functionality after being dropped from as much as six feet and opened and closed hundreds of thousands of times.

"The key features of the design- the hinge and trigger- need not be restricted to cell phones," Buch said. "They could be used on any similar device, some examples being pagers, PDA's, text-messaging devices and others that provide combinations of these features and more. However, since cell phones are the most popular and widespread cellular communications devices, Neil and I thought it seemed like the more appropriate design. Also, the flip-feature is more typical to cell phones than any other device."

The team entered the phone into the PTC/Motorola design competition and took home an award for the benefits that the design has for Motorola.

The Modeling Process

Once the team finalized their concept, they began modeling using the Pro/Engineer Computer Aided Design (CAD) software by PTC. During modeling, the two students made

minute changes in size, springs and other physical aspects of the phone. While the single-handed operation was decided on very early during the design process, the trigger system was initially meant to be a button with a hook that held the two halves together. Design complications and durability issues prompted them to change to the solenoid system toward the latter stages of modeling.

Design issues such as these are worked out in class. Robert Fulton, a professor of mechanical engineering at Georgia Tech, was a strong source of support for the team during the process. Fulton teaches the course in which the students were enrolled, called ME 4041.

“They had a basic idea and started modeling from there,” Fulton said. “Companies look for innovative changes in their products and students often have the best ideas for improving their products.”

Students enrolled in Fulton’s class form teams to create a design project of their choice. Recent designs include a newspaper dispenser that keeps customers from taking more than one newspaper, a pivot screwdriver and an innovative fishing reel.

Most of the student work is done in the CAD laboratory in the Woodruff School of Mechanical Engineering. The lab is equipped with 17 workstations where students learn practical applications using CAD and Computer-Assisted Engineering (CAE) applications in thermal and mechanical design.

Tord Dennis, a research engineer and who heads the CAD lab, assists students as they learn to use the software and develop their computer-based modeling and design projects. [300 dpi JPEG download = 4.41M]

Tord Dennis, a research engineer and who heads the lab, assists students as they learn to use the software and develop their computer-based modeling and design projects. He says the lab provides a solid foundation for building strong engineering ethics and practices.

“A key to building engineers of the future is partnering with industry to provide students with design competitions like this,” Dennis said. “When healthy competition and peer collaboration are combined with guidance from practicing engineers, it spurs creativity and innovation that you can’t get from a classroom setting alone.”

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