Electrical and Computer Engineering Students Open the Door to Effortless Wheelchair Access

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Addressing issues affecting the handicapped community, electrical and computer engineering senior design students are making wheelchair access effortless, one door at a time. Students Jon Kay, Garet Scranton and Jason Hall, under the direction of Olivera Notaros, head of senior design, are developing technology to integrate with current handicapped door systems and give handicapped citizens greater freedom of access.

The team has designed an electronic transmission system for wheelchairs and receiving doors. Equipped with a pulsing circuit, the mobile device has transmitters that communicate with receiving doors within range and cause them to open upon approach. Currently, handicapped citizens must push the button to open doors, which is limiting to individuals who are without the use of their fingers, biceps or triceps. An innovative system, this touchless design will serve to work in conjunction with standard wheelchair access button entries, providing greater independence to those with limited mobility.

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As the spring semester approaches, the team is concentrating on adding an accelerometer circuit to the device for motion sensing. This will allow the device to remain off or inactive until wheelchair acceleration is detected. Students are also working to limit the range of a transmitter to only open doors within a determined distance, as opposed to all doors in a building. Future plans involve advancing the functionality of the product to include direction detection and security.

Senior capstone students will learn more than just the research and design behind new technology development. Students plan to team with the Colorado State University Entrepreneurship Club, part of the College of Business Entrepreneurship Center, to create a business and marketing plan for their innovative prototype. In addition, students will work in partnership with handicapped citizens on product development, while developing multi-disciplinary relationships and teamwork skills.

"Through the use of electrical engineering, our team hopes to help the handicapped community, and show that CSU's engineering students really can and do make a difference using knowledge and skills gained on campus," said Kay. "We hope that handicapped individuals — initially students and faculty on campus — who previously needed additional assistance opening doors, will soon be able to access buildings on their own with ease."

Each year, engineering undergraduate students participate in a capstone senior design project. Senior design projects allow students to develop practical, hands-on skills preparing them for success in an integrated, interdisciplinary engineering environment. This year the Electrical and Computer Engineering Department will support 21 senior projects, emphasizing collaboration with industry partners. In addition to research and design, students must work to secure donations in the form of equipment, hardware and money to complete their goals.

For more information on the electrical and computer engineering senior design program please visit
http://www.engr.colostate.edu/ECE401/AY07_senior_design_projects.html