
feature story

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Motion Picture Camera Stabilizer Wins Presidents' Scholarship

BY ALLISON ICKOWICZ

A stabilization device for a handheld motion picture camera won Adam Daniel Sidman a US \$10 000 scholarship from the IEEE. His "Camera Stabilization: Take 2" project was awarded the 2005 IEEE Presidents' Scholarship at the 56th Intel International Science and Engineering Fair, held 8 to 14 May in Phoenix.

The 17-year-old, soon to enter his senior year at Palmer High School in Colorado Springs, Colo., has been involved in filmmaking and engineering since the sixth grade, so perhaps it was only natural that his project merged his favorite disciplines. Sidman uses his device to shoot his own videos. He has worked on two feature films and has produced approximately 25 commercials and dozens of short films, documentaries, and TV installments.

"Filmmakers are always looking for new ways to move a camera smoothly across a set," Sidman says. "I noticed that the two common camera stabilization devices are rather a strain for the operator, difficult to maneuver, and are pretty cost prohibitive." He designed his device to be portable, and at the same time give the operator complete control over the camera.

Sidman's patent-pending device stabilizes a motion picture camera about two axes using Analog Devices' MEMS (microelectrical mechanical system) rate gyroscopes. The gyros are mounted to a gimballed camera rig to measure the angular rate of each axis. The gyro signals are amplified to drive corresponding servo motors coupled to the camera's rotational axes in the opposite direction of sensed rotation.

An integrator circuit acting on each rate signal helps ensure that extraneous forces don't cause the camera to drift. A pair of power operational amplifiers differentially drives each servo motor from the sum of the proportional and integrated rate signals. The rig's control panel allows the operator to slew the camera up and down or left and right. Dynamic walking and running tests demonstrate a substantial decrease in the peak angular rates as compared to conventional mechanical camera stabilization devices.

Sidman says his device is more compact, lightweight, and maneuverable than others on the market, eliminating the need for a body brace to help carry the camera. Visual tests have confirmed the effectiveness of the device, he says.

He has spent 700 hours to develop his invention, and he is working on improvements. He is readying a three-axis design and is trying to reduce power consumption by using speed-reduced motors to create a battery-powered handheld device.

He is waiting for his patent application to be granted before he begins marketing his product. He says his device could be manufactured at a fraction of the cost of similar products already on the market because it could be built with relatively inexpensive parts, such as the MEMS gyro sensors.

His father, Michael D. Sidman, is an IEEE senior member. It's the first time the Presidents' Scholarship has been awarded to the child of an IEEE member.

Adam Sidman says he plans to study both film and engineering in college. He has not chosen a university yet.

Along with the scholarship, he received a certificate, and he is to be presented with an engraved plaque at a September ceremony honoring his accomplishment. In addition, the IEEE will pick up the cost of his student member dues for his four years in college. The scholarship and the other items are funded by the IEEE

Foundation, but in the future IEEE members will also be able to contribute to the scholarship fund. You can now help the Foundation fund the IEEE Presidents' Scholarship. [see "[New Fund for IEEE Presidents' Scholarship Established.](#)"]
