Minnesota teenager wins $10,000 IEEE Presidents' Scholarship

On May 16, 18-year-old James J. Jefferson from Winona, Minnesota USA won the IEEE Presidents' Scholarship presented at the 2002 Intel International Science and Engineering Fair in Louisville, KY.

For his winning project, "Automatic packet reporting system (APRS): building a large scale geospatial database," he collected and cataloged the entire APRS Internet stream into a relational database. The techniques he designed and built can be used for applications such as rerouting emergency or hazardous materials vehicles due to traffic problems, improving highway design, or reducing the cost of deploying cellular telephone infrastructure.

Mr. Jefferson bounded onto the stage to receive the $10,000 college scholarship from IEEE Foundation President, Emerson W. Pugh. The IEEE Foundation funds the Scholarship, which is the largest single award given by an organization in the Special Awards Category.

"Observing the excitement and enthusiasm of hundreds of young people at the Intel ISEF Special Awards Ceremony was a rewarding experience for me," said Dr. Pugh. "I was especially pleased that the IEEE Foundation had an opportunity to help support the college education of James Jefferson. He is a fine young man with a truly innovative project and, I believe, a great future."

"It was easy to speak to judges and others about this project, because it's based on my Ham Radio experience. I've been a Ham Radio operator since about 1995, and I have this device in my truck that reports data as I drive around. It just came to me that something useful could come from all this data, if it could be collected and analyzed," said Mr. Jefferson. "In the future, the GPS systems in cars and now even on cell phones could serve the same function."

For the purposes of the project, he concentrated on the Los Angeles freeway system. The data is reported in a variety of ways, which means that Mr. Jefferson had to write a program that translated the data into a common format. He developed the software to analyze the position data and wrote another program to search digital maps for the distance to the nearest road, in order to offer options to people stuck in traffic. He has written approximately 10,000 lines of computer source code for this project.

Working completely on his own, Mr. Jefferson did his original research without benefit of mentor or funding support. His software collects more than 600,000 data points a day. A friend helped him locate space for a series of computers he linked together called a Beowulf cluster to work the data. The rest of the work he does in about three quarters of his home basement space.

For relaxation Mr. Jefferson tends to a weather station he built with a friend in a field near his home and enjoys hiking and biking. Last year, while hiking in Alaska, he reported his movements by APRS. In the fall, he will attend Iowa State University at Ames, Iowa, and major in Computer Sciences. He plans to continue with his project, investigating the use of neural networks to detect road anomalies such as traffic jams. Mr. Jefferson also received prizes from IEEE Computer Society, Intel Foundation, and the Society of Exploration Geophysicists.