

# Software engineer's tool makes for quicker tests

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A UT Arlington software engineer is refining a computer testing tool that reduces the amount of time and expense companies must spend to determine whether a new program works.

Jeff Lei, an associate professor of computer science and engineering, said the Advanced Combinatorial Testing System has myriad applications though he currently is focused on using ACTS in healthcare information technology. Lei's work is supported by two new National Institute of Standards and Technology grants worth a total of \$400,000. The work has the potential to greatly reduce the cost of healthcare while improving the quality, he said.

"In our world, you can't test everything. There could be an infinite number of ways to test a particular [software](#)," Lei said. "But what our tool does is test the software enough to be certain of the software's ability."

[NIST](#) is a division of the U.S. Department of Commerce. Established in 1901, it is one of the nation's oldest physical science laboratories. NIST measurements support everything from [nanoscale devices](#) to the largest of manmade creations to global communications networks.

Lei and his team have worked closely with colleagues at NIST since 2005 to study and refine "combinatorial testing," which became ACTS. NIST even makes their testing tool available on the agency's website.

Combinatorial testing reduces the amount of testing done without sacrificing proof that a software program works. Combinatorial testing works best on [complex systems](#), such as those used in healthcare.

Healthcare information is sensitive, and therefore needs to be secure and reliable, Lei said. Combinatorial testing can provide those assurances, he said.

Under one of the new grants, Lei and his team will focus efforts on healthcare tests and how medical devices talk to each other.

Lei said that more than 50 percent of the cost of developing new software may be consumed by testing, whether the software is in the [healthcare sector](#) or another sector.

When testing periods can be reduced, companies can achieve savings, he said. More than 1,000 firms have requested use of the combinatorial testing tool, Lei said.

"Some systems – like medical devices or defense weapons or disaster communications networks – need to have as high a reliability factor as possible," Lei said.

Jean-Pierre Bardet, dean of the College of Engineering, said Lei's work exemplifies the benefit of UT Arlington research to the private sector.

"Dr. Lei's tool reduces the cost of doing business, which can dramatically alter the dynamic of how business operates," Bardet said. "This tool allows business and industry to forge into new frontiers while managing the cost of software implementation."

Provided by University of Texas at Arlington

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