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## Dr. Ben Choi receives U.S. patent on groundbreaking computing research

Nov 23, 2020 | **Engineering and Science, Faculty/Staff, Innovation, Research**

Dr. Ben Choi, associate professor of computer science at Louisiana Tech University, has received a U.S. patent (10,795,854) on groundbreaking technology, "Method and apparatus for constructing multivalued microprocessor." Choi has designed a new microprocessor that goes beyond the traditional binary values and has the potential to revolutionize the computing industry.

Choi used his expertise in computing and electrical systems to develop and patent designs and processes for increasing the computational speed and memory by breaking away from binary values to use more than two numerical values on microprocessors. Once manufactured, this improvement to the foundational architecture for designing and building microprocessors will be the only patented non-binary (multivalued) technique in the world.

In recent years, computing has inched closer to speed limits due to the limited speed for changing between 0 and 1. With Choi's groundbreaking, multiple-digit logic gate microprocessors that allow processing more digits at once, devices like phones, tablets, computers, tvs, and home systems will be able to process data faster and thus get smarter.

"This new microprocessor is a game changer," Choi said. "It could improve the ways that our technology works for us by increasing the computational speed and, therefore, the functionality of applications. In the near future, computers could be built based on this technology."

Choi earned his PhD, MS, and BS degrees from The Ohio State University, specializing in computer science, computer engineering and electrical engineering. His research focus areas include Humanoid Robots, Artificial Intelligence, Machine Learning, Intelligent Agents, Semantic Web, Data Mining, Fuzzy Systems, and Parallel Computing. Choi received two previous U.S. patents: one on creating new search engines and the another on the automatic organization of computer files.



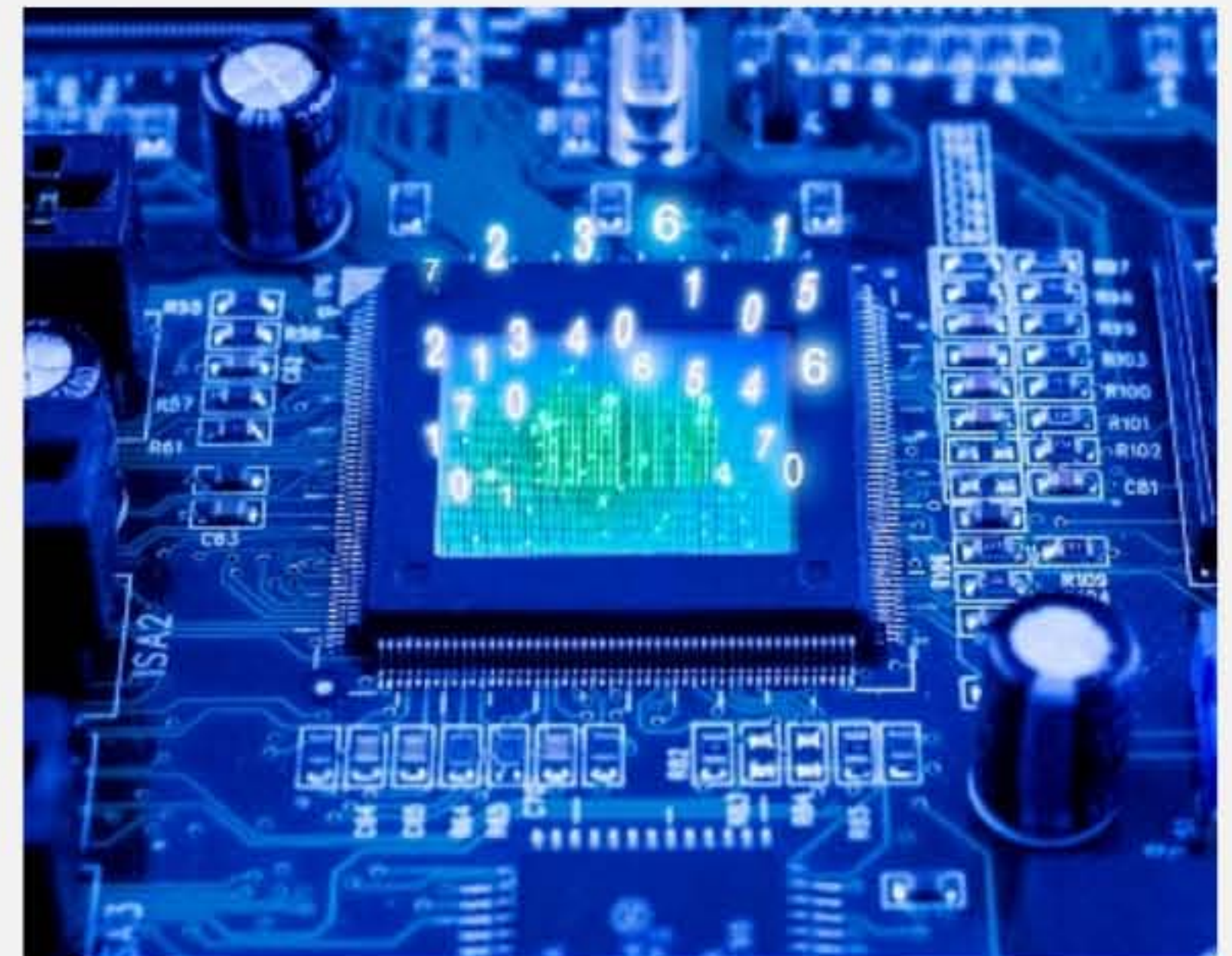
## Computer scientist to present groundbreaking research

Posted on May 25th, 2016 by [Dave Guerin](#) | Categorized under [Engineering and Science](#), [Research and Development](#)

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Dr. Ben Choi, associate professor of computer science at Louisiana Tech University, will present his research on a groundbreaking new technology that has the potential to revolutionize the computing industry during a keynote speech next month at the International Conference on Measurement Instrumentation and Electronics.

Choi will present on a foundational architecture for designing and building computers, which will utilize multiple values rather than binary as used by current computers. The many-valued logic computers should provide faster computation by increasing the speed of processing for microprocessors and the speed of data transfer between the processors and the memory as well as increasing the capacity of the memory.



This technology has the potential to redefine the computing industry, which is constantly trying to increase the speed of computation and, in recent years, has run short of options.

By providing a new hardware approach, the technology will push the speed limit of computing using a progressive approach which will move from two values to four values, then to eight values, then to 16 values, and so on. Future computers could be built using this many-valued approach.

“Advances in the foundational design of the computer are needed in business and research applications as well as at the foundation of cyber security efforts across the nation,” said Dr. Galen Turner, director of computer science, cyber engineering, electrical engineering and electrical engineering technology at Louisiana Tech. “Dr. Choi’s invitation to present at the upcoming conference has increased interest in this foundational architecture.”

Louisiana Tech and Choi have filed a U.S. patent application for this groundbreaking technology titled “Method and Apparatus for Designing Many-Valued Logic Computer.”

“If this is successful, computers in the future will be based on our technology,” said Choi. In addition to the keynote speech, Choi’s research will be released in a publication in the related journal.

Choi earned his Ph.D., M.S., and B.S. degrees from The Ohio State University, specializing in computer science, computer engineering and electrical engineering. His research focus areas include Humanoid Robots, Artificial Intelligence, Machine Learning, Intelligent Agents, Semantic Web, Data Mining, Fuzzy Systems, and Parallel Computing.

Prior to coming to Louisiana Tech, Choi served as a visiting research scholar at DePaul University, University of Western Australia and Hong Kong University of Science and Technology. He has also worked in the computer industry as a System Performance Engineer at Lucent Technologies (Bell Labs) and as a private computer consultant.

<http://news.latech.edu/2016/05/25/computer-scientist-to-present-groundbreaking-research/>

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