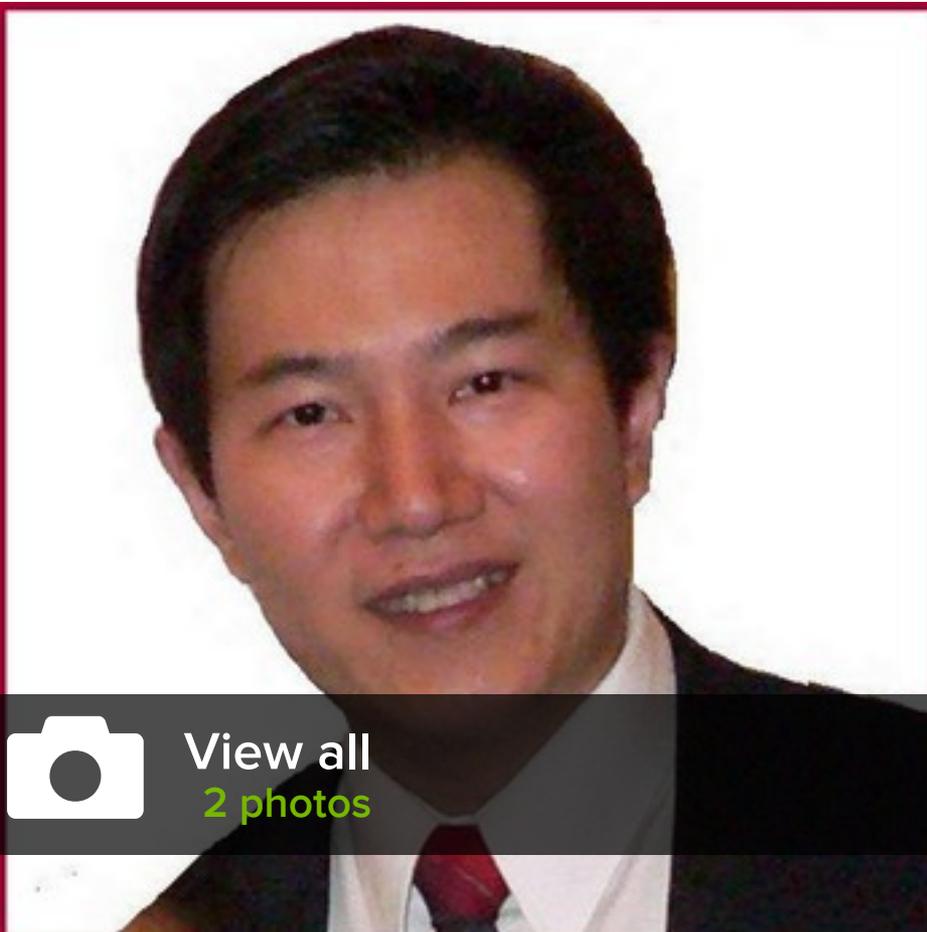


# Convergence of ancient art and cutting-edge technology

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Dr. Frank Lee

*Dr. Li*

The 2012 Midwest Chinese American Science and Technology Association Annual (MCASTA) Symposium was hosted in St. Louis, Missouri on Sept 8. It was exciting to learn that with the development of [cloud computing](#) and genomic technology there is great potential for better [Tai Chi/Qigong](#) research and learning.



*St. Louis Chinese American News*

The Midwest Chinese American Science and Technology Association (MCASTA) was established in St. Louis, Missouri in 1983. The main objective of MCASTA is to provide opportunities for scientists, engineers, and professionals residing in the Midwest to exchange scientific and technological information, encourage joint efforts in research and development through the establishment of professional networks and promote professional excellence. Dr. Bih-Ru Lea, Director of ERP at Department of Business & IT at Missouri University of Science & Technology, was the President for this year. The theme for this year is Biotechnology Enhanced by Cloud Computing.

Cloud computing delivers the usage of computer's hardware and software via Internet. Cloud computing allows remote services with a user's data, software and computation. Cloud computing relies on sharing of resources of hardware and software to achieve **economies of scale** over a network. Dr. **Su-Shing Chen**, Professor of Department of **Computer Information Science & Engineering (CISE)** and Director of **Systems Biology Laboratory** at University Florida, explained that cloud computing greatly improves computing effectiveness and performance. PubMed is a text mining system for biomedical literature. It becomes more powerful with clouding computing. Dr. Chen stated that cloud computing makes complex bio-medical research possible and provides opportunity for research collaboration across different geographic regions and countries. With its powerful computing capabilities, cloud computing is also a useful tool for eLearning.

Today many Tai Chi practitioners find it challenging to find good instructors locally. As their Tai Chi skills improve, they find it even harder to elevate their knowledge unless they are willing to travel to study with a master. It would be extremely helpful if the international Tai Chi community can adopt cloud computing and develop a method for interactive remote teaching/learning.

Dr. [Frank Lee](#), a senior solution architect and executive of Business Development at IBM, is an expert in developing the infrastructure of cloud computing for next generation genome sequencing (NGS). Last year, he worked on sequencer-to-data infrastructure architecture for a biomedical research lab and designed a three-layer-virtualization infrastructure for a National Institute of Health SIG proposal. During the symposium, he gave an interesting presentation explaining how genome sequencing helps disease diagnosis.

Dr. Lee stated that a human genome consists of trillions of cells, 23 pairs of chromosomes, 2 meter-long DNA, 3 billion DNA subunits, and approximately 300,000 genes code for proteins that perform most life functions. Genome sequencing involves large data processing. It was extremely time-consuming thus the first genome sequencing cost \$1 billion dollars. Due to the development of faster computers, more robust software, and cloud computing, the cost of genome sequencing has dropped significantly. Apple Computer founder Steve Job's sequencing was reported at \$100,000. Dr. Lee said that it is estimated that the cost will drop to \$1,000 in 2013.

Due to the relatively low cost and less time in sequencing, genomic medicine can be widely used in diagnosis, personalized treatment, preventive medicine and many other areas. Genomic differences can be shown when a person is young versus old, when a person is healthy versus sick, and when a person is treated versus non-treated.

Today, the research scientists of biomedicine have utilized many advanced technologies to prove the health effects of Tai Chi. It would be interesting to find out the impact from Tai Chi practice on genome sequencing and its differences soon.

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