Tongue Analysis Software Developed at MU Uses Ancient Chinese Medicine to Warn of Disease

For 5,000 years, the Chinese have used a system of medicine based on the flow and balance of positive and negative energies in the body. In this system, the appearance of the tongue is one of the measures used to classify the overall physical status of the body, or *zheng*. Now, University of Missouri researchers have developed computer software that combines the ancient practices and modern medicine by providing an automated system for analyzing images of the tongue.

[1]"Knowing your *zheng* classification can serve as a pre-screening tool and help with preventive medicine," said Dong Xu, chair of MU's computer science department [2] in the College of Engineering [3] and study co-author. "Our software helps bridge Eastern and Western medicine, since an imbalance in *zheng* could serve as a warning to go see a doctor. Within a year, our ultimate goal is to create an application for smartphones that will allow anyone to take a photo of their tongue and learn the status of their *zheng*."

The software analyzes images based on the tongue's color and coating to distinguish between tongues showing signs of "hot" or "cold" *zheng*. Shades of red and yellow are associated with hot *zheng*, whereas a white coating on the tongue is a sign of cold *zheng*.

"Hot and cold *zheng* doesn't refer directly to body temperature," said Xu, who is also on the faculty of the Bond Life Sciences Center [4]. "Rather, it refers to a suite of symptoms associated with the state of the body as a whole."

For example, a person with cold *zheng* may feel chills and coolness in the limbs and show a pale flushing of face. Their voice may have a high pitch. Other symptoms of cold sheng are clear urine and loose stool. They also may prefer hot foods and drinks and desire warm environments.

In Chinese traditional medicine both hot and cold *zheng* can be symptoms of gastritis, an inflammation of the stomach lining frequently caused by bacterial

infection.

For the study, 263 gastritis patients and 48 healthy volunteers had their tongues analyzed. The gastritis patients were classified by whether they showed infection by a certain bacteria, known as *Helicobacter pylori*, as well as the intensity of their gastritis symptoms. In addition, most of the gastritis patients had been previously classified with either hot or cold *zheng*. This allowed the researchers to verify the accuracy of the software's analysis.

"Our software was able to classify people based on their *zheng* status," said study co-author Ye Duan, associate professor of computer science at MU.

"As we continue to work on the software we hope to improve its ability," Duan said. "Eventually everyone will be able to use this tool at home using webcams or smartphone applications. That will allow them to monitor their *zheng* and get an early warning about possible ailments."

The study "Automated Tongue Feature Extraction for ZHENG Classification in Traditional Chinese Medicine" was accepted for publication in the journal *Evidence Based Complementary and Alternative Medicine.* The study's first author was doctoral student Ratchadaporn Kanawong and the second author was post-doctoral researcher Tayo Obafemi-Ajayi.

MU News [5]

Posted by Janine E. Mooney, Editor

May 29, 2012

Source URL (retrieved on *12/07/2013 - 8:19pm*):
http://www.wirelessdesignmag.com/news/2012/05/tongue-analysis-software-developed-mu-uses-ancient-chinese-medicine-warn-disease

Links:
[1] https://nbsubscribe.missouri.edu/news-releases/2012/0524-tongue-analysis-software-developed-at-mu-uses-ancient-chinese-medicine-to-warn-of-disease/attachment/xu-dong/
[2] http://engineering.missouri.edu/cs/
[3] http://engineering.missouri.edu/
[4] http://bondlsc.missouri.edu/
[5] http://munews.missouri.edu/news-releases/2012/0524-tongue-analysis-software-developed-at-mu-uses-ancient-chinese-medicine-to-warn-of-disease/