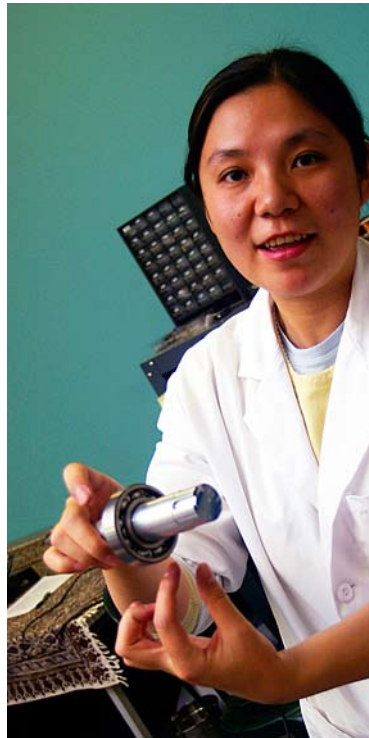


Industry Collaboration

Wireless Monitoring Research Seeks Cheap Leap in Industry Efficiency



Brithinee Electric is supporting research at the University of California, Riverside to develop inexpensive methods to monitor the performance of most industrial electric motors.

Today, advanced condition monitoring systems are expensive and implemented only on large motors. Yet small motors (fewer than 200 horsepower) make up 98 percent of motors used by U.S. industry.

Prof. V Sundararajan, professor of mechanical engineering, and his team at the Bourns College of Engineering are developing inexpensive methods to bring the benefits of advanced condition monitoring to the great majority of electric motors.

The scale of the potential benefits can be seen in the fact that electric motor-driven systems used in industrial processes consume 23 percent of all electricity sold in the United States, according to the U.S. Department of Energy.

To make fault monitoring cost effective, the team is experimenting with wireless, energy harvesting sensors that are easy to deploy and require little or no maintenance.

The new wireless sensor nodes allow monitoring of current, vibration, sound, and temperature at an installation cost much lower than wired sensor systems. The technology is cost effective because it allows flexible installation, placement in limited spaces and can it be integrated to commercially available wireless embedded systems.

The team has done remote testing of their monitoring systems inside Brithinee facilities, according to Xin “Crystal” Xue (pictured above), a graduate student from Shanghai, China. They have also evaluated the data output from wired and wireless sensors.

Overall the concept is proving sound, but the team is reconfiguring the wireless sensors to improve signal resolution, particularly in the higher frequencies.

By last spring they had evaluated the capabilities of current wireless transmission in motor environments. Then they build a motor fault simulation testbed and began working on algorithms for motor fault diagnosis. Work is expected to continue into next summer to construct a wireless machine fault monitoring system for diagnosing motor faults.

One key to the practicality of the approach is developing a sensor node which harvests its own power from the motor’s magnetic field - making installation flexible and maintenance cheap. The team has succeeded in powering the sensor in this way, but is working to make the necessary ferromagnetic coil smaller.

Other members of Prof. Sundararajan team are Luis Gonzalez, Rafael Garcilazo and Miaogen Zhang.

Brithinee Electric, of Colton, CA, is a leading provider of electric motors, control systems and motor repair.