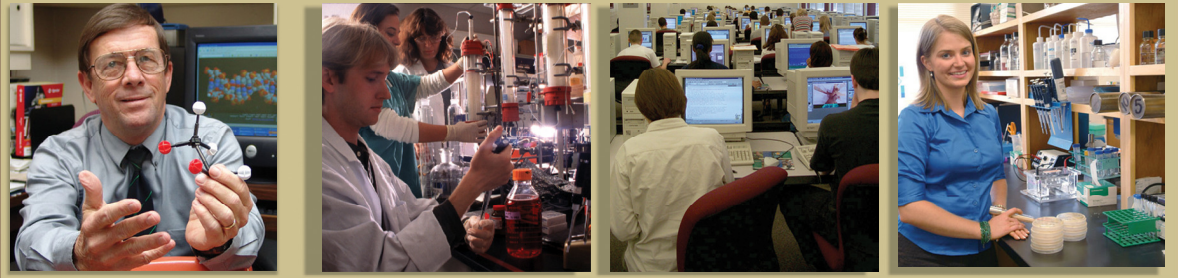




THE FLORIDA STATE UNIVERSITY OFFICE OF IP DEVELOPMENT & COMMERCIALIZATION



Technology Opportunity

High Performance Fuel Cell

One of the main concerns with current fuel cell technology is the relatively poor response to instantaneous power demands. Regular fuel cell/supercapacitor hybrid technology is the only way to solve this issue. However, in some applications, such as the application for electrical vehicles, the size and weight of the power sources are key concerns. FSU researchers have used the monolithic method to configure the hybrid fuel cell system called the Monolithic Hybrid Fuel Cell (MHFC). The capacitive materials are directly sandwiched or mixed into the fuel cell. An electrolyte and electronic separator is unnecessary. Furthermore, the peripherals for separated supercapacitors, such as cooling systems and electrical connectors, are unnecessary as well. The new configurations not only reduce the size and weight of the hybrid system, but they also reduce costs of manufacturing and installing the hybrid system.

Applications

- Power source for electric and hybrid vehicles
- Stationary power generation units
- Consumer electronics

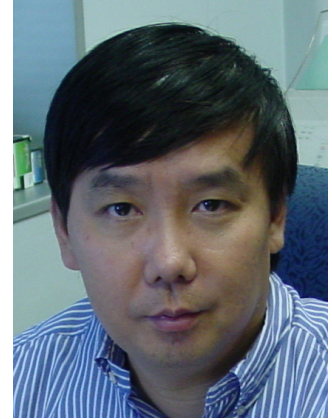
Advantages

- First of its kind to integrate a fuel cell and supercapacitor in one device
- Provides significant fuel savings while providing clear and green energy
- Increases power and energy density without adding weight and volume to a fuel cell
- Adds device capability
- Improves the life cycle of the fuel cell by reducing its high polarization



The Inventors

Dr. Zheng Dr. Jim P. Zheng is a professor at the Department of Electrical and Computer Engineering of Florida A&M University (FAMU) and Florida State University (FSU). He obtained his Ph.D. degree from the State University of New York at Buffalo in 1990. He joined the FAMU-FSU College of Engineering in July 1997. Before this position, he has worked at US Army Research Laboratory in the Sensors and Electron Devices Directorate located at Fort Monmouth, NJ for about five (5) years. He has published more than eighty-seven (87) articles in scholarly journals, and eighty (80) papers in conference proceedings in the fields of energy storage, fuel cells, nano-sensors, photonics, and thin film growth, and been awarded eleven (11) patents, and two (2) patents have been licensed by a private company located in Los Angeles, CA. He has won numerous research grants from many governmental agencies such as NSF, NASA, and DOD totaling more than \$12 M. He has graduated six (6) doctoral degree students and nine (9) master's degree students, and has supervised three (3) post-doctoral fellows. He has received many awards including National Research Council Fellow Award in 1993, Army Research & Development Achievement Award in 1997, NASA Faculty Research Award in 1999, and Progress Energy Professional Development Award in 2005. He is member of Materials Research Society, Electrochemical Society, and Institute of Electrical and Electronic Engineers.



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