Introduction to Sensor Issue

The increasing importance of sensor technology has been driven by the rampant growth of microprocessor usage as evidenced by the pervasiveness of sensors in our daily lives. Many future needs for sensors remain in the areas of safety, consumer products, pollution control, medical engineering, manufacturing and industrial processes. These will continue to stimulate further research and development in the field.

The objective of this special sensor issue is to offer electroceramics' view on the state and development of sensor technologies. This issue contains seven articles on the following types of sensors:
dielectric sensors (capacitance sensors),
pyro-electric and pyro-optical sensors,
electrochemical sensors,
piezoelectric sensors,
resistive sensors,
magnetic sensors,
optical sensors.

While these articles are aimed at the general reader, they also include the latest developments that will attract specialists from the sensor field. These papers offer comprehensive coverage about the status of current sensors, the critical issues with current technologies, and the direction of future development efforts. The readers are encouraged to pay special attentions to two key issues: first, the competition of different technologies for the same sensing applications, and second, the various degrees of compatibility between different sensor technologies to the micro-electronics (silicon) technology. Progress on these two issues will be critical to the success and growth of individual sensor technologies.

Unfortunately, two subjects, semiconductor sensors and sensing enhancement by software and hardware, that were originally planned for this issues are not included. The first, a review of developments in high temperature semiconductor sensors is not yet ready and will be published in a later issue. The second, we have chosen to postpone both because the subject may be too diverse, and because developments in this field remain primitive. Although we have seen many applications of sensors employing software and hardware for monitoring and automated control systems, we have seldom seen them successfully used for enhancing or strengthening sensors in the area of sensitivity, selectivity, and response time. Sensor arrays in conjunction with pattern recognition is one of the few examples of recent development work in this direction.

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Da Yu Wang
Guest Editor