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2nd International Conference on

Materials Science and Materials Chemistry

March 20-21, 2019 | London, UK

Global crisis/sustainability technologies - in actuator/piezoelectric devices

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There are four factors that have influences on engineering: Social/culture/religion, Technology/science, Economics, and Politics/law. The strength of the impact of these factors becomes different according to history. Alchemy of the 16th century is an example of "Socio-Engineering". From the Christian doctrine, "Heliocentric model" was denied, but "alchemy" was approved. Religion was controlling science. In the 17th-18th centuries, people were solved from the spell of religion and engineering based on science and technology, so-called "Techno-Engineering" is respected instead. In the 18th-19th centuries, technologies for mass production at low manufacturing cost were required and "Econo-Engineering" became mainstream to enhance national strength. The intention of increasing national wealth and military strength increased friction and that led to the First and Second World War in the 20th century. Engineering of this period is mainly government-led production of war weapons, and it was a beginning of "Politico-Engineering". After the wars, mass production technologies for the reconstruction/recovery revived, but when the 21st century began, as a consequent result, environmental degradation, resource depletion, and food famine have become major problems. Global regulations are strongly called, and the government-initiated technology ("politico-engineering") has become important again in order to overcome the regulations. Politico-Engineering covers (1) legally-regulated normal technologies such as sustainability, and (2) crisis technologies.

Speaker Biography

Kenji Uchino a pioneer in piezoelectric actuators, is Director of International Center for Actuators and Transducers. He is also the founder and Senior VP & CTO of Micro-mechatronics, Inc. Prior to joining Penn State in 1991, he was a Research Associate in the physical electronics department at Tokyo Institute of Technology. He joined Sophia University, Japan, as an Associate Professor in physics in 1985. He was also involved with Space Shuttle Utilizing Committee in NASDA, Japan, and Vice President of NF Electronic Instruments, USA. He is the Chair of Smart Actuator/Sensor Study Committee sponsored by Japanese MITI. He was the associate editor for Journal of Advanced Performance Materials, J. Intelligent Materials Systems and Structures, and Japanese Journal of Applied Physics. He has authored 550 papers, 54 books and 26 patents in the ceramic actuator area.

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