Special Issue on Sensor Application Development

Preface





The continuous advancement of sensor technologies and functional materials is driving innovation across the fields of manufacturing, energy systems, environmental monitoring, and sustainable engineering. Emerging developments in advanced materials, sensing techniques, and characterization methods are enabling more accurate measurements, improved material performance, and enhanced system reliability.

This Special Issue, "Advanced Sensor Application Development," brings together multidisciplinary research contributions highlighting recent progress in functional materials, sensor applications, nondestructive evaluation, and engineering monitoring.

The published papers demonstrate how innovative materials and advanced measurement approaches can address technological challenges across various industrial and scientific fields. Several contributions focus on advanced functional materials and their potential applications in sensing and energy technologies. These include investigations in ZnSb and $Bi_2Te_{2.3}Se_{0.7}$ thermoelectric materials, conductivity enhancement in PVA/PEDOT/lignin/cellulose nanocrystal composites, and nickel–iron layered double hydroxides for CO_2 adsorption and water electrolysis. Research on corn-husk-based natural-fiber composites further highlights opportunities for sustainable material development.

This issue also presents advances in sensing applications and engineering evaluation, including vibration-based nondestructive assessment of pineapple texture, structural analysis of autonomous bus chassis, and acoustic performance evaluation of mufflers. Additional studies explore thermal sensing-assisted monitoring during gas carburizing, the thermal stability of black GaAs nanotip surfaces for infrared sensor interfaces, and questionnaire-derived human sensing for health needs assessment.

Collectively, these contributions emphasize the importance of integrating advanced materials, innovative sensing approaches, and reliable characterization techniques to improve engineering performance, resource efficiency, and technological sustainability. The findings provide valuable perspectives for future developments in sensor technologies and their practical applications.

We sincerely thank all the authors for their valuable contributions, the reviewers for their constructive evaluations, and the editorial team for their dedicated support. We hope this Special Issue will serve as a useful reference and inspire further research and innovation in advanced sensor applications and functional materials.

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