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Editorial

Micro and Nano Sensors from Additive Manufacturing

Ehsan Nazarzadeh Zare,[1] **Pooyan Makvandi**,[2] **and Sezgin Ersoy**[3]

[1]*College Damghan University, Damghan, Iran*
[2]*Istituto Italiano di Tecnologia, Centre for Materials Interfaces, Pontedera, 56025 Pisa, Italy*
[3]*Marmara University, Technology Faculty Mechatronic Engineering, Istanbul, Turkey*

Correspondence should be addressed to Sezgin Ersoy; sersoy@marmara.edu.tr

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Developments in the field of fabrication technologies have positively affected, besides many other fields, the sensor technologies too. Researches are being done for utilizing those newly developed technologies for the fabrication of sensors [1].

Additive manufacturing technologies have greatly expanded their potential thanks to many processing technologies from nanoparticles to dielectric multiproduction methods and sub-micro processing technologies.

The microelectromechanical system, called MEMS, is a technology used to create integrated devices or systems from basic components such as mechanics and electricity, and the nanoelectromechanical system (NEMS) can be formed by performing this process in nanodimensions. [2–4].

Surface [5] and body [6] micromachining and traditional methods such as Lithography, Galvanoformung, and Abformung [7] are frequently used in MEMS production. By using this traditional method, products with a more precise, small, and measurable working principle can be produced. However, this is a factor that increases costs. Additive manufacturing technologies and traditional methods can eliminate these costly disadvantages. With small-scale laboratories, time, space, and cost-intensive processes such as sourcing, storage, transportation, and storage can be avoided. These small laboratories can operate like a factory, producing 3D products such as microfluidics [8–10], micromechanical systems [11, 12], optical systems [13], cell structures [14], and biomedical devices [14–18].

Integrated circuits (ICs) can be produced on scales ranging from a few micrometers to millimeters using batch processing techniques. These devices or systems are capable of sensing, controlling, activating, and generating macroscale effects [19, 20]. Mechanical microstructures, microsensors, microconductors, and microelectronics integrated into silicon chip devices form MEMS technology. The components of MEMS devices are generally microscopic. Lifts, gears, pistons, engines, and steam engines are manufactured by MEMS [21, 22]. However, this technology is not just about miniaturizing mechanical components or making something out of silicone. It is a fabrication technology developed to design and build integrated electronics using mass production techniques as well as complex mechanical devices, and systems [23]. The MEMS is the latest technology in mechanical, electrical, electronic, and chemical engineering. The MEMS consist of mechanical, electrical systems with a size in microns. It is a technology used to minimize systems. Electrical components such as inductors and capacitors can be significantly improved compared to their integrated counterparts when manufactured using MEMS and nanotechnology [24, 25]. With the use of MEMS technology, great attention was paid to expanding new production processes, semiconductor devices, and microscale resistors to be used in various optoelectronic devices [26]. Additive manufacturing, which is generally called three-dimensional (3D), will continue to change the way of design, production, and service in MEMS and NEMS technologies. With this production technology, we can meet the demands of many product ranges from the medical field to space technologies, from microfluidics to optical devices [27]. In addition, the complex geometries of micro/nanosized products can be produced with high precision and production can be carried out at much lower costs. Keeping these two parameters together can be defined as superior production capability. It will be able to respond to the required mass production or special production. In the near future, it is possible to produce products that meet special engineering demands such as micro-nano composites and magnetic structures. The special issue of micro- and nanosensors from additive manufacturing opens to present advances in additive manufacturing and micro- and nanosensor.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this Editorial.

Ehsan Nazarzadeh Zare
Pooyan Makvandi
Sezgin Ersoy

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