BrainKorea FOUR 21 Mechanical Eng. SEMINAR

Smart Material Liquid Metal Microfluidic Platforms and Its Applications

SPEAKER Prof. Daeyoung Kim(Korea Army Academy at Yeong-cheon)

DATE Wednesday, Feb. 15, 2023 (2:00p.m.-)

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PLACE #108 at 5th Engineering Bldg.

Gallium-based liquid metal alloy has been of interest due to its non-toxicity, high thermal and electrical conductivities along with liquid property. In cooperation with development of micro/nano-fluidics, the liquid metal-based applications' characteristics could be widely tuned as long as the liquid metal was deformed on-demand. However, the liquid metal alloy has a challenging problem which is that the alloy becomes readily oxidized in the atmospheric air environment resulting in wetting almost any solid surface. Therefore, it has been a hurdle for applying the liquid metal in various applications. In this presentation, various approaches to mobilize the alloy such as a surface textured micro pillar array, carbon nanotube on PDMS, and an HCl vapor treatment will be discussed. Additionally, I will explain a method to have on-demand liquid metal manipulation, deformation, and expansion along with various applications such as a reconfigurable photomask, inkjet printer, electrical switches, energy harvester, and paper-based electronics.

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