# A Platform to Manipulate Carbon Nanotubes Utilizing Optically-induced Dielectrophoretic Forces and its potential applications for nano-sensing

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## Abstract

This study unveils an optically-driven platform upon which the manipulation of carbon nanotubes (CNTs) can be accomplished. A photoconductive layer generates a non-uniform electric field at specific optically illuminated sites, which are usually referred to as “virtual electrodes,” that induces dielectrophoretic forces for manipulating the CNTs. The software-controlled light patterns enable a flexible platform since it is now possible to dynamically reconfigure the optically-projected electrode pattern. This approach allows for the real-time manipulation and patterning of CNTs. The sorting and separation of bundled and dispersed CNTs is also demonstrated. This developed platform may be promising for the rapid fabrication of CNT-based nano-sensors, purification of synthesized CNTs and other applications requiring nano-scale manipulation.

## Bibliography

Gwo-Bin Lee received his B.S. and M.S. degrees in Department of Mechanical Engineering from National Taiwan University in 1989 and 1991, respectively. He received his Ph.D. in Mechanical & Aerospace Engineering from University of California, Los Angeles, USA in 1998. Dr. Gwo-Bin Lee is currently a Distinguished Professor in the Department of Engineering Science at National Cheng Kung University. His research interests lie on nano-biotechnology, micro/nanofluidics and their biomedical applications. Dr. Lee has been active in the field of micro/nanofluidic systems, and is developing integrated micro/nano systems

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