

## Design and Analysis of an Electro Thermally Symmetrical Actuated Microgripper

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**Abstract :** This paper presents design and analysis of an electrothermally symmetrical actuated microgripper applicable for performing micro assembly or biological cell manipulation. Integration of micro-optics with microdevice leads to achieve extremely precise control over the operation of the device. Geometry, material, actuation, control, accuracy in measurement and temperature distribution are important factors which have to be taken into account for designing the efficient microgripper device. In this work, analyses of four different geometries are performed by means of COMSOL Multiphysics 5.2 with implementing Finite Element Methods. Then, temperature distribution along the fingertip, displacement of gripper site as well as optical efficiency vs. displacement and electrical potential are illustrated. Results show in addition to the industrial application of this device, the usage of that as a cell manipulator is possible.

**Keywords :** electro thermal actuator, MEMS, microgripper, MOEMS

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