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CONFERENCE TITLE: Electro-active Polymer Actuators and Devices (EAPAD) (ss04) **CONFERENCE CHAIR**: Yoseph Bar-Cohen, Jet Propulsion Lab.
ABSTRACT TITLE: Electro-statically stricted polymers (ESSP)
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ABSTRACT TEXT: Electro-statically stricted polymers (ESSP) have been shown to produce large displacements when subjected to high voltage field. Coulomb forces are responsible for the actuation and these forces are proportional to the square of the electric field magnitude. A soft polymer film that is coated with electrodes on both surfaces is being squeezed under this electric field causing lateral extension. Polymers such as silicone were reported to induce displacements at the range of 30 percent, which are relatively large values. The material can be shaped as a rope to have a muscle configuration, however in this shape under electro-activation extension is induced. To produce contraction as in biological muscles it is necessary to modify the electric field and to induce the field in the lateral direction. Such a field can be produced by comb electroding, which can be shaped in various configurations to allow electric field manipulation. Tailoring the field offers unique capabilities but taking full advantage of the potential requires adequate understanding of the field interaction. Finite element modeling of the field interaction is underway while developing the fabrication methodology for such actuators

KEY WORDS: Electroactive Polymers, Artificial Muscles, Actuators, Ionomers, Equivalent Circuits.

BRIEF BIOGRAPHY: Prof. Chang Liu...