Optimal design of a microgripper-type actuator based on AlN/Si heterogeneous bimorph - DTU Orbit (10/01/2019)

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This work presents a systematic procedure to design piezoelectrically actuated microgrippers. Topology optimization combined with optimal design of electrodes is used to maximize the displacement at the output port of the gripper. The fabrication at the microscale leads us to overcome an important issue: the difficulty of placing a piezoelectric film on both top and bottom of the host layer. Due to the non-symmetric lamination of the structure, an out-of-plane bending spoils the behaviour of the gripper. Suppression of this out-of-plane deformation is the main novelty introduced. In addition, a robust formulation approach is used in order to control the length scale in the whole domain and to reduce sensitivity of the designs to small manufacturing errors.

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