

Design concept of a new bio-inspired tactile sensor based on main pulvinus motor organ cells distribution of Mimosa pudica plant

ABSTRACT

This paper proposed a novel concept for a new tactile sensor that is inspired by the seismonastic movement of plants. The movement of Mimosa Pudica leaf is due to the change of pressure between the upper and lower motor organ of main pulvinus. From an engineering point of view, the turgidity changes capable of reversible shape changes, thus bringing the idea of sensing and actuating concept of a new tactile sensor. The idea is to fusion the artificial cell of Mimosa Pudica as the sensing mechanism for the new bio-inspired tactile sensor. Experiments have been conducted in order to determine the volume of the upper n lower motor organ cells of main pulvinus. The aim is to view the cross section of the main pulvinus between before and after the stimulation applied which led to two experiment procedures. Experimental results show that area of upper motor organ cell is approximately 50% larger than lower part for all four samples when mechanical stimulation applied. The design concept of the bio-inspired tactile sensor is proposed.