

## **An Automated Sensor System for Cochlear Implants Electrode Array Insertion**

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**Abstract :** A cochlear implant, referred to as a CI, is a small electronic device that can provide direct electrical stimulation to the auditory nerve. During cochlear implant surgery, atraumatic electrode array insertion is considered to be a crucial step. However, during implantation, the mechanical behaviour of an electrode array inside the cochlea is not known. The behaviour of an electrode array inside of the cochlea is hardly identified by regular methods. In this study, a CI electrode array capacitive sensor system is proposed. It is able to automatically determine the array state as a result of the capacitance variations. Instead of applying sensors to the electrode array, the capacitance information from the electrodes will be gathered and analysed. Results reveal that this sensing method is capable of recognising different states when fed into a pre-shaped model.

**Keywords :** cochlear implant, electrode, hearing preservation, insertion force, capacitive sensing

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