

## **Bio-inspired signal detection mechanism for tongue click waveform used in human echolocation**

### **ABSTRACT**

Human echolocation is the ability of an individual (which is often a blind person) to use his/her signal such as sound from tongue clicks to perceive the surrounding. Basically this requires the person to listen and analyse to the return echo of the tongue clicks. The main characteristics of the tongue click signal waveform have been reported, however the fundamental principle on a person's ability to identify his/her own signal is still vague. The possible detection mechanism of the tongue click signal waveform used in human echolocation technique is discussed and imitated it as artificial detection system. The proposed mechanism which is based on human hearing process in synthesising the signal illustrates that the detection performance is improved as compared to the detection performance by the traditional matched filtering technique. The findings of this Letter create new potential for the development of any artificial human echolocator system, sensor systems like radar and sonar as well as applications inspired by human echolocation miracles.