

Tip o' the Tongue: Hands-Free Music Browsing and Exploration

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Abstract

Tip o' the Tongue is a novel interface for browsing a music collection: the user interaction is performed entirely with the tongue. Four small sensors are placed inside the mouth and are triggered by the user's tongue to train the automatic playlist generation and other aspects of the music playback. This system allows people with certain kinds of disabilities (i.e. paralyzed from the neck down) to enjoy music like everybody else.

1 Introduction

One of the holy grails of Music Information Retrieval (MIR) community is automatic playlist and recommendation systems. We want our computers to automatically produce the music that fits our desires without any kind of explicit user interaction. Although great progress is being made, it is clear that some form of user interaction will still be required in the near future. The immediate goal then shifts from “how do we produce music without any user input?” to “how can we make this user input as easy as possible?”.

Current music players are controlled by buttons or wheels. This is appropriate for the average person sitting in an office or walking to the subway, but there are many cases in which hands are not free to operate the device. For example, consider somebody commuting by bike, a craftsman working with clay, or a Canadian sitting outside enjoying the snow. If the biker reaches into his pocket to control the mobile music device, he only has one hand (and half his concentration) left to control the bike, putting him at

greater risk of a traffic injury. The craftsman either must stop his work and wash his hands, or would end up with a very messy device. The Canadian cannot control the device while wearing his mittens, and thus must expose his skin to the frozen.

All of the above cases could be classified as mere annoyances – after all, listening to a disliked song or taking a short break from work or commuting will not harm anybody. However, there are people who cannot control electronic devices with their hands even if they dearly want to. Consider paraplegics or people suffering from serious injuries such as having two broken arms. Providing an option for seriously-injured patients in a hospital to personalize their music-listening experience will make their hospital stay less painful!

2 Overview of *Tip o' the Tongue*

Tip o' the Tongue is based on the Withar Mini-Touch RB-8005 sensor. These water-resistant 3mm-wide sensor is activated with a force of 0.1 N, making them quite suitable for activation by a human tongue. It sends a signal via bluetooth, so the amount of foreign material in the user's mouth is minimized.

After an initial user study, we found that the best location for the sensors was directly on the pre molar teeth. Using these four sensors, users could send six messages: touching each sensor individually, as well as touching both sensors on one side of the mouth simultaneously. To prevent accidental messages, the sensors were only activated on a “double-tap”.