Recognizing movement intention through brain activity

**Outcome:** By tapping into the brain circuits that control movement, Boston researchers from CELEST, an NSF Science of Learning Center, have developed a brain-computer interface that allows a mouse to signal its intent to move. The system takes advantage of the fact that there are specific brain activity patterns that signal the intent to move.

**Impact/Benefits:** This system will help transition brain-computer interfaces from the laboratory to the real world by allowing users to turn the interface only when they want to move, freeing their attention for other tasks.

**Explanation/background:** The brain-computer interface recognizes the intent to move by analyzing brain signals in the motor cortex—the part of the brain responsible for movement. The mouse learns to control the brain activity patterns that signal movement intention by listening to the frequency of an auditory feedback tone that indicates how similar current brain activity is to the desired pattern. Eventually the mouse learns how to signal movement intention without actually moving.

**Caption:** Movement-intention brain-computer interface. Brain signals from electrodes implanted in motor movement areas are translated into computer commands by a decoder in order to change the frequency of an auditory tone.