

Ripple: Communicating through Physical Vibration

Nirupam Roy, Romit Roy Choudhury



Exploring a new modality

Word cloud including: Magnetic, VisibleLight, Acoustic, NFC, Bluetooth, Vibratory Communication, InfraRed, RFID.

Potential applications

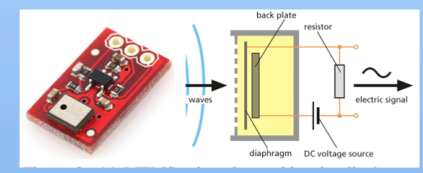
Mobile money transfer: Two phones, one with 'SEND' and one with 'RECEIVE'.

Ring for authentication: A hand holding a ring over a phone screen that says 'Vibratory Passcode Detected'.

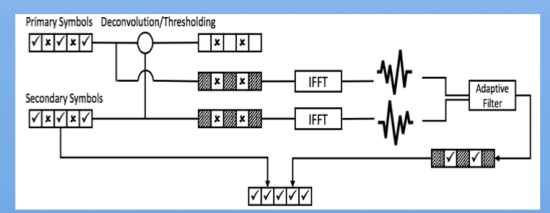
Table-top multicast: Multiple phones on a table connected by red wavy lines.

Ripple-II: 32Kbps vibratory communication

- Microphone as the vibration sensor

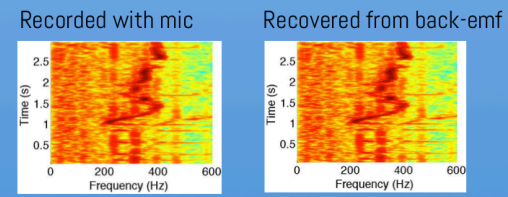


- Vibratory and acoustic noise cancellation
 - Two-microphone based noise cancellation setup
 - Symbol Selective Adaptive Noise Filtering



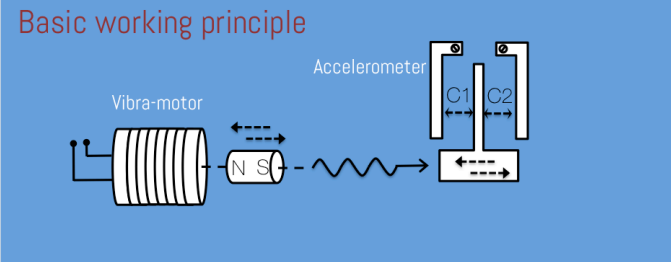
- MAC layer rate control and retransmission

- Sensing interference through Back-EMF



- Proactive symbol level retransmission

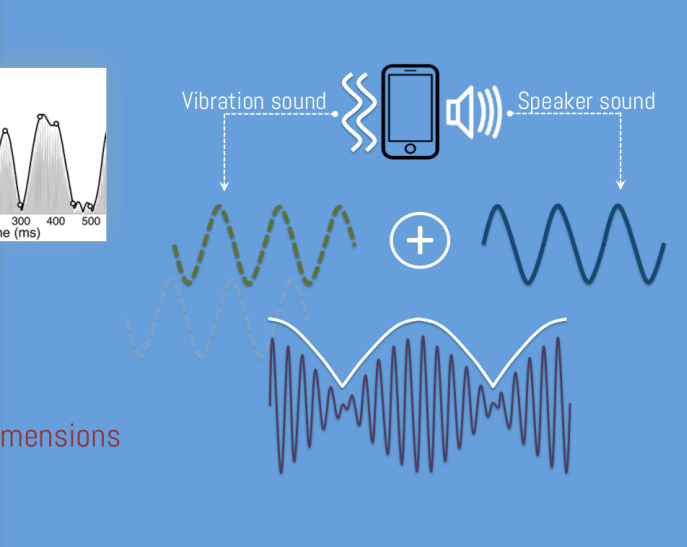
Ripple-I: Vibratory radio for mobile devices



Ripple breaks away from Morse-code

Transmission on multiple dimensions

Cancelling leakage sound of vibration



Please visit our project webpage for the demo:
<http://synrg.csl.illinois.edu/ripple/>