Boxing Attackers In: Towards Tangible Defenses against Eavesdropping Attacks

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MOTIVATION

To prevent a malicious third party from **listening to users' private conversations** through the phone's microphone

A protection system that provides a **tangible** sense of privacy is desirable to **assure** users
We explore **sound proofing boxes** with **various materials** to find suitable defenses

EXPERIMENTAL SETUP

First experiment setting

Location	Conference room
Device	iPhone 5S
Audio Sound level	Lenovo x260 50 vol (≈55DB)
Testing Distance	50cm, 1m,2m,3m
Background Noise	Conversation level decibel(≈55DB)
Audio File	Male speech 16s

Second experiment setting

Location	Soundproof studio	
Device	iPhone 8	
Audio Sound level (DB)	38~44	Library – 40
	48~55	Conversation at home-50
	58~65	Conversation at restaurant-60
Audio File	Female speech 3.50s / Male speech 3.50s	

Third experiment setting

Location	Home environment	
Device	iPhone 8 / I pad	
Audio Sound level(DB)	From iPad with earphone to iPhone	≈50
	From laptop to iPhone	≈50

The first experiment boxes

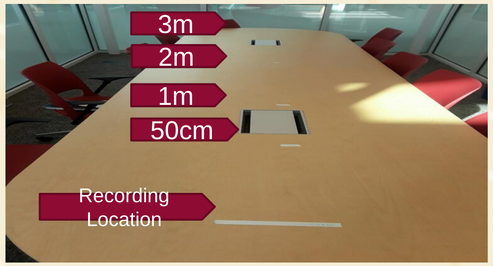
Mat in and out

Egg foam in and out

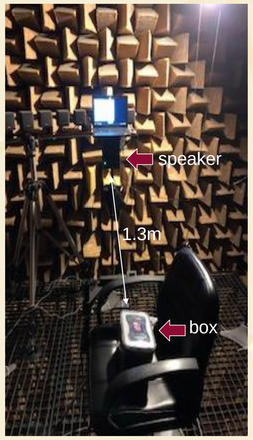
Sound deadening tape

Car mat in and out

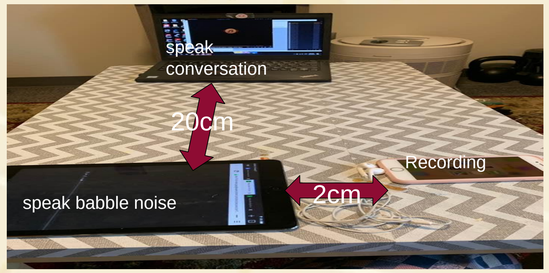
First experiment setting



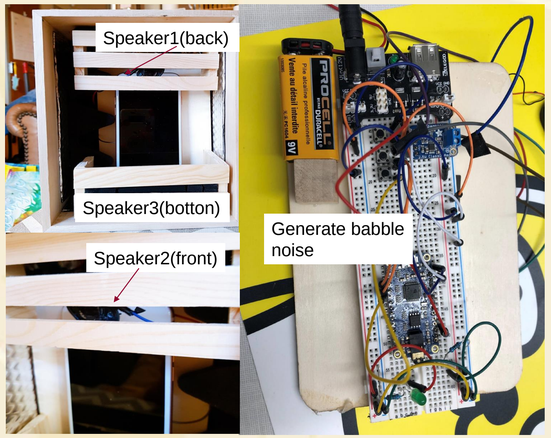
Second experiment setting



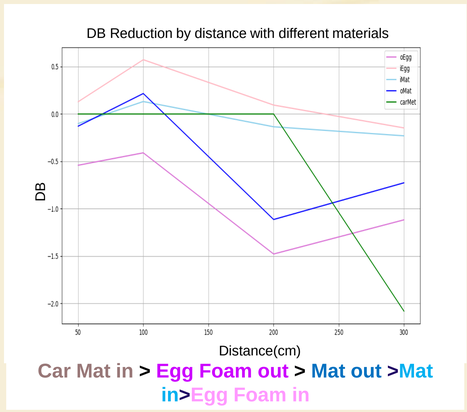
Third experiment setting



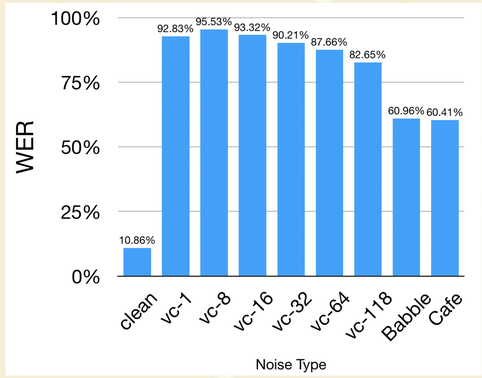
Final prototype



PRELIMINARY FINDINGS



Car Mat in > Egg Foam out > Mat out >Mat in>Egg Foam in



RESULTS

- Combining the car mat and egg foam shows the best result with male and female voices
- Mat is better at damping female voice and car mat is better with male voices
- Babble mixtures provide a suitable defense
- 100% Word Error Rate with Babble noise at 0 dB SNR

FUTURE WORK

- Still exploring a usable design, e.g. to use at the bedside?
- Fine tuning noise generators inside the box

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